Škola za cestovni promet

XI. MEĐUNARODNI SIMPOZIJ „INTERDISCIPLINARNOST LOGISTIKE I PROMETA”

XI. International Symposium Interdisciplinarity of Logistics and Traffic

ZBORNIK RADOVA

Aplikacija ZOOM

Zagreb, 30. rujna - 1. listopada 2021.

Škola za cestovni promet

PROGRAM RADA

Četvrtak, 30. 9. 2021.

08:30 – 09:00	**Registracija sudionika**		
09:00 – 09:20	**Otvaranje Simpozija**	**Škola za cestovni promet, Zagreb**	

Red. br.	Vrijeme	Tema stručnog rada	Autor/i	Organizacija
1.	09:20 – 09:40	Prometne nesreće mladih vozača u Varaždinskoj županiji	Marijana Balić Lovrec, mag. ing. traff. Andreja Koščak Lacković, dipl. ing. Monika Žganec, mag. ing. traff.	Strojarska i prometna škola Varaždin
2.	09:40 – 10:00	RFID tehnologije i primjena u poštanskom sistemu	mr. sci. Emilija Martinčević, dipl. ing. saob. i komunikacija	Srednja škola za saobraćaj i komunikacije Sarajevo
3.	10:00 – 10:20	Bezbednost vo soobrakajot novi bezbednosni tehnologii	Zlatko Petrušov, dipl. soobr. inž.	SOU “Gošo Vikentiev” Kochani
4.	10:20 – 10:40	Povezovanje z gospodarstvom s pomočjo uporabe pedagoškega pristopa storyline pri angleščini za logistične tehnike	Eva Boh, profesorica angleščine	Šolski center Celje
	10:40 – 11:00	**Pauza**		
5.	11:00 – 11:20	Bo stroj nadomestil učitelja?	mag. Andreja Jelen Mernik, univ. dipl. matem.	Šolski center Celje
6.	11:20 – 11:40	Asistenčni sistemi za varnost v cestnem prometu	Sebastjan Andrejc mag. Roman Krajnc	Šolski Center Celje
7.	11:40 – 12:00	Soobrakajnata bezbednost na učenicite okolu učilištata	Borche Josheski, dipl. soobr. inž. m-r pedagog Irena Pipidzanoska prof. Valentina Geramitchioska	S.O.U „Riste Risteski – Ricko“ - Prilep
8.	12:00 – 12:20	Proširenje pješačke zone u centru Grada Zagreba	Igor Jelić, mag. ing. traff. Alen Tursunović, mag. ing. traff	Škola za cestovni promet, Zagreb Mobilita Evolva, Zagreb
9.	12:20 – 12:40	Komparativna analiza znanja vozača s probnom vozačkom dozvolom u zavisnosti od načina osposobljavanja	Ivica Ristić, dipl. inž. saobraćaja Ivana Selenić, dipl. inž. saobraćaja Milica Cvetković, dipl. inž. saobraćaja	Tehnička škola Vranje Mačvanska srednja škola Bogatić

	12:40 – 13:00	**Pauza**		
10.	13:00 – 13:20	EU projekt „Good Practice on the Move“	Lovorka Vidić, dipl. ing. strojarstva Sanja Tirić, dipl. ing. strojarstva	Škola za cestovni promet, Zagreb
11.	13:20 – 13:40	Vpliv epidemije covid-19 na promet	Jožica Pavlovič, dipl. ing. log.	Strokovni izobraževalni center Ljubljana
12.	13:40 – 14:00	IKT tehnologija u pomorskom prometu	Davor Lakoš, mag. ing. nautike	Prometno-tehnička škola Šibenik
13.	14:00 – 14:20	Menadžment u strukovnom obrazovnom sustavu	dr.sc. Zorana Bačelić	Prometno-tehnička škola Šibenik
14.	14:20 – 14:40	Procesni elementi za kakovost javnega mestnega potniškega prometa	mag. Roman Krajnc	Šolski center Celje
	14:40 – 15:00	**Pauza**		
15.	15:00 – 15:20	Isporaka i bezbednost na opasnite materii vo vozdušniot transport	m-r. Snežana Božinoska Risteska, dipl. soobr. inž.	Avtosoobraќaen učilišen centar “Boro Petruševski” - Skopje
16.	15:20 – 15:40	Ocjena kvaliteta zraka i nivo buke u ulici Bosanska – Općina Travnik – u cilju uređenja iste kao pješačke zone	doc. dr. sc. Kemal Jaganjac	J.U. srednja škola za saobraćaj i komunikacije Sarajevo
	15:40 – 16:00 **16:00 – 17:00**	**Evaluacija i zaključak prvog dana Simpozija** **Sastanak organizacijskog odbora**	**Škola za cestovni promet, Zagreb**	

Škola za cestovni promet

Petak, 1. 10. 2021.

	08:30 – 09:00	**Registracija sudionika**		
Red. br.	**Vrijeme**	**Tema stručnog rada**	**Autor/i**	**Organizacija**
1.	09:00 – 09:20	EU projekt „LOG-IN“	Renata Heljić, dipl. ing. strojarstva Željka Turković, dipl. oec.	Škola za cestovni promet, Zagreb
2.	09:20 – 09:40	Gradenje na soobraќajnata kultura	Violeta Sekuloska, dipl. soobr. inž.	S.O.U “Riste Risteski – Ricko” – Prilep
3.	09:40 – 10:00	EU projekt „Driver Exchange Skill Competition“ - DESCO	Tomislav Kučina, dipl. ing. prometa Tomislav Ćurković, dipl. ing. prometa	Škola za cestovni promet, Zagreb
4.	10:00 – 10:20	Promocija u obrazovanju	Marijeta Mašić, prof. Alen Panić, struč. spec. ing. traff.	Prometna škola Rijeka
5.	10:20 – 10:40	Srednje stručno obrazovanje za zanimanja u području rada saobraćaj u Republici Srbiji	Nemanja Radović, dipl. ing. saobraćaja Svetlana Veličković, dipl. ing. saobraćaja Marko Popović, dipl. ing. saobraćaja	Zavod za unapređivanje obrazovanja i vaspitanja, Saobraćajno – tehnička škola Zemun
	10:40 – 11:00	**Pauza**		
6.	11:00 – 11:20	Sigurnost pješaka u prometu – mladi za mlade	Maja Balenović, mag. ing. traff., Tomislav Ćurković, dipl. ing. prometa	Škola za cestovni promet, Zagreb
7.	11:20 – 11:40	Poletna logistična šola – v vidiku novih metod poučevanja logističnih modulov	Ksenja Rožanski Fidler, univ. dipl. inž. tehnologije prometa	Šolski center Celje
8.	11:40 – 12:00	Obrazovni sistemi	Vildana Čelić, B.Sc. Sabahudin Solak, B.Sc.	Srednja ekonomska škola u Sarajevu, Srednja prometna škola Sarajevo
9.	12:00 – 12:20	Vpliv epidemije na stanje prometne varnosti v Republiki Sloveniji	Matic Turnšek, uni. dipl. inž.	Šolski center Celje

10.	12:20 – 12:40	Biciklistički promet i biciklistička prometna infrastruktura u gradu Varaždinu	Verica Kopriva-Kozjak, dipl. ing. Siniša Horvat, mag. ing. traff.	Strojarska i prometna škola Varaždin
	12:40 – 13:00	**Pauza**		
11.	13:00 – 13:20	Varnost udeležencev v prometu	Metka Hojnik Verdev, prof.	Šolski center Celje
12.	13:20 – 13:40	Mladite i vozačite početnici – rizična i ranliva grupa učesnici vo soobrakajot	m-r Gordana Kozuvarovska, dipl. soobr. inž.	Republički savet za bezbednost saobraćaja
13.	13:40 – 14:00	Težave pri izobraževanju odraslih na daljavo	Andrej Prašnikar, univ. dipl. ing. tehnol. prom.	Strokovni izobraževalni center Ljubljana
14.	14:00 – 14:20	Varna mobilnost dijakov srednje Prometne šole Maribor	Dušan Veršec, dipl. ing. saobraćaja Benjamin Pivec, mag. ing. saobraćaja Bogomir Brečko, dipl. ing. saobraćaja	Prometna šola Maribor
	14:20 – 15:00	**Evaluacija i završetak Simpozija**		

ORGANIZACIJSKI ODBOR ŠKOLE DOMAĆINA:

- **Tomislav Ćurković, dipl.ing.prom.**
- **Tomislav Kučina, dipl.ing.prom.**
- **Renata Heljić, dipl.ing.strojarstva**
- **Natalija Ozimec, dipl.ing.prom.**
- **Igor Jelić, mag.ing.traff.**
- **Goran Matić, dipl.ing.prom.**
- **Maja Balenović, mag.ing.traff.**
- **Ivana Zelenika, prof.**
- **Bruno Marković, mag.ing.traff.**

PROGRAMSKI ODBOR:

- **Tomislav Kučina, dipl.ing.prometa, predsjednik**
  Škola za cestovni promet, Zagreb
- **mr. Srećko Kljajić**
  JU Srednja stručna škola „ Ivan Uskoković“, Podgorica
- **mag. Roman Krajnc**
  Šolski center Celje, Celje
- **Kemal Jaganjac dipl.inž.saob.**
  Srednja škola za saobraćaj i komunikacije, Sarajevo
- **Nemanja Radović, dipl.inž.saob.**
  Zavod za unapređivanje obrazovanja i vaspitanja, Beograd
- **Nikolče Spasovski, dipl.saob.inž.**
  ASUC – Boro Petruševski, Skopje

ORGANIZACIJSKI ODBOR:

- **Tomislav Ćurković, dipl.ing.prometa, predsjednik**
  Škola za cestovni promet, Zagreb
- **mr. Srećko Kljajić**
  JU Srednja stručna škola „ Ivan Uskoković“, Podgorica
- **mag. Andrea Jelen Mernik**
  Šolski center Celje, Celje
- **Sejad Mujezinović dipl.inž.maš**
  Srednja škola za saobraćaj i komunikacije, Sarajevo
- **Srdjan Vidanović, dipl.inž.saob.**
  Zajednica saobraćajnih škola, Beograd
- **Mimoza Gichevska, dipl.mas.inž.**
  ASUC – Boro Petruševski, Skopje

SADRŽAJ

STROJARSKA I PROMETNA ŠKOLA VARAŽDIN, Varaždin, 10.06.2021.

Autori:
Marijana Balić Lovrec, mag.ing.traff
Andreja Koščak Lacković, dipl.ing
Monika Žganec, mag. ing. traff.

Predmet: Prijava teme za XI. Međunarodni simpozij „Interdisciplinarnost prometa i logistike“

PROMETNE NESREĆE MLADIH VOZAČA U VARAŽDINSKOJ ŽUPANIJI

Sažetak:

Svakodnevne životne potrebe zahtijevaju savladavanje prostornih razlika različitim načinima. Ubrzan razvoj prometa i povećanje motorizacije uz brojne prednosti ima i neželjenu posljedicu, a to je smanjenje sigurnosti. Prometne nesreće, osim individualnih tragedija, predstavljaju i velike gubitke za društvo.

Mladi vozači uzrokuju veliki broj prometnih nesreća, pogibaju i trpe psihičke, fizičke i materijalne posljedice.

Varaždinska županija, prema dostupnim podacima, bilježi pad ukupnog broja prometnih nesreća i smrtno stradalih osoba. Broj prometnih nesreća u kojima su sudjelovali mladi vozači je smanjen ali je povećan broj smrtno stradalih osoba u tim prometnim nesrećama.

Cilj ovog rada je istražiti najčešći uzroke nastajanja prometnih nesreća u kojima su sudjelovali mladi vozači u Varaždinskoj županiji te predložiti moguća rješenja za poboljšanje sigurnosti.

Istraživanje će se provesti na temelju statističkih podataka i anketiranjem mladih sudionika u prometu. Usporedbom podataka iz navedenih izvora generirati će se prijedlozi za poboljšanje sigurnosti mladih u prometu.

Ključne riječi: *sigurnost, prometne nesreće, mladi vozači, uzroci prometnih nesreća, posljedice prometnih nesreća*

UVOD

Mladi vozači predstavljaju rizičnu skupinu sudionika u prometu jer zbog svojeg neiskustva i precjenjivanja vlastitih mogućnosti uzrokuju veliki broj prometnih nesreća. Strojarska i prometna škola u sektoru prometa obrazuje Tehničare cestovnog prometa, Tehničare za logistiku i špediciju i Vozače motornog vozila. Vozač koji je stekao određeno obrazovanje poštuje prometna pravila i propise i odnosi se ozbiljno prema ostalim sudionicima u prometu. U vožnji takav se vozač ne nameće drugima, nego nastoji pomoći ostalim vozačima kako bi se izbjegla prometna nesreća. Učenjem se postiže znanje za normalno odvijanje prometa. To znanje je poznavanje zakona i propisa, poznavanje kretanja vozila i poznavanje vlastitih sposobnosti. Cilj škole je da odgaja mlade odgovorne vozače koji će biti svjesni opasnosti u prometu i mogućnosti prevencije istih. Kako bi došli do saznanja koji su najveći problemi vezani uz mlade u prometu provedena je anketa među mladim vozačima te obrađeni statistički podaci PU Varaždinske. Na temelju dobivenih podataka biti će predložena moguća rješenja za prevenciju prometnih nesreća sa mladim vozačima.

PROMETNE NESREĆE MLADIH VOZAČA U VARAŽDINSKOJ ŽUPANIJI

Prema Zakonu o sigurnosti prometa na cestama „mladi vozač“ je vozač motornog vozila u dobi do navršene 24. godine života koji posjeduje vozačku dozvolu izdanu na teritoriju Republike Hrvatske.

1.1. Statistički podaci prometnih nesreća

Posljednjih nekoliko godina u Republici Hrvatskoj posebno se vodi statistika prometnih nesreća sa mladim vozačima. Prema statistici velik broj mladih vozača sudjeluje u teškim prometnim nesrećama sa poginulim osobama gdje su najčešći uzroci nepropisna i neprimjerena brzina, oduzimanje prednosti prolaska te alkohol. Najveći broj prometnih nesreća sa mladim vozačima događa se vikendom kada kod izlaska konzumiraju alkohol i to najčešće subotom.

Po satima najveći broj prometnih nesreća događa se između 14-16 sati, a najteže posljedice su između 20-22 te 02-04 sata ujutro u vrijeme polaska i povratka sa noćnog izlaska.

U narednim tablicama prikazani su statistički podaci koje vodi PU varaždinska, a vezano uz prometne nesreće, uzroke i posljedice u kojima su sudjelovali mladi vozači posljednjih pet godina.

Tablica 1. Prometne nesreće u Varaždinskoj županiji

Godina	2015.	2016.	2017.	2018.	2019.
Ukupan broj prometnih nesreća	1186	1212	1247	1260	987
S poginulim osobama	10	13	9	8	7
S ozlijeđenim osobama	375	394	398	329	282

Iz tablice 1 je vidljivo da je ukupan broj prometnih nesreća u Varaždinskoj županiji varirao odnosno da se 2017. i 2018. povećao, a 2019. pao i najmanji je u posljednjih 5 godina. Zabrinjavajući su rezultati iz tablice 2 gdje je prikazano kako izuzetno veliki broj prometnih nesreća u prosjeku oko 10% od ukupnog broja prouzrokuju vozači sa kratkim vozačkim stažem od 0-5 godina što nam pokazuje da su neiskustvo i precjenjivanje vozačkih sposobnosti vrlo opasni u prometu.

Tablica 2. Prometne nesreće u Varaždinskoj županiji u kojima su sudjelovali vozači sa kratkim vozačkim stažem u velikom postotku mladi vozači

Godina Vozački staž	2015.	2016.	2017.	2018.	2019.
0-2 godina	88	101	95	103	87
3-5 godina	42	38	39	45	40

Tablica 3. Prometne nesreće u Varaždinskoj županiji u kojima su sudjelovali mladi vozači

Godina	2015.	2016.	2017.
Ukupan broj prometnih nesreća	65	46	43
S poginulim osobama	2	1	3
S ozlijeđenim osobama	63	45	40

Iz tablice je vidljivo da su mladi vozači u 2017. godini skrivili manje prometnih nesreća nego u prethodnim godinama ali je porastao broj prometnih nesreća u kojima su sudjelovali s poginulim osobama. Također je vidljivo da gotovo u svakoj prometnoj nesreći ima ozlijeđenih osoba što ukazuje na težinu prometnih nesreća u kojima se sudjelovali. Takve prometne nesreće psihički vrlo intenzivno djeluje na vozača, a kod još

neformiranih ličnosti i ako je mladi vozač bio odgovoran za tu prometnu nesreću ostavlja posljedice za cijeli život.

Tablica 4. Broj registriranih vozača prema dobi u Republici Hrvatskoj

Dob vozača	Registrirano vozača	Postotak %
Do 18 godina	12 120	0,5
19-24 godine	183 330	7,8
25-34 godine	427 062	18,1
35-44 godine	510 889	21,7
45-54 godina	508 311	21,6
55-64 godina	475 856	20,2
65 i više	301 368	12,8
Ukupno	2.348.794	100

Iz tablice je vidljivo da mladi vozači čine svega 7,9 % posto od ukupnog broja registriranih vozača u Republici Hrvatskoj.

1.2. Uzroci prometnih nesreća

Tablica 5. Uzroci prometnih nesreća koje su prouzročili mladi vozači u Varaždinskoj županiji

Uzroci/godina	2015.	2016.	2017.
Nepropisna i neprimjerena brzina	22	23	25
Alkohol	21	10	18
Ostali uzroci	22	13	0

Statistički podaci u Republici Hrvatskoj i Varaždinskoj županiji pokazuju da su glavni uzroci prometnih nesreća u kojima sudjeluju mladi vozači nepropisna i neprimjerena brzina, alkohol i nepoštivanje prednosti prolaska odnosno nedovoljno poznavanje prometnih pravila i propisa.

1.3. Posljedice prometnih nesreća

Tablica 6. Prometne nesreće u Varaždinskoj županiji po posljedicama

Godina	2015.	2016.	2017.	2018.	2019.
Poginule osobe	10	16	9	8	7
Teško ozlijeđene osobe	103	91	89	75	54
Lakše ozlijeđene osobe	393	414	459	356	307

Iz tablice i grafikona je vidljivo da se broj poginulih u Varaždinskoj županiji smanjio u odnosu na 2015. i 2016. godinu, jedino se povećao se broj lakše ozlijeđenih u 2017. godini što je u uzročno posljedičnoj vezi s brojem prometnih nesreća. Posljednje tri godine broj ozlijeđenih osoba je padu kao i ukupan broj prometnih nesreća.

Tablica 7. Prometne nesreće u Varaždinskoj županiji u kojima su sudjelovali mladi vozači po posljedicama

Godina	2015.	2016.	2017.
Poginule osobe	2	4	3
Teško ozlijeđene osobe	14	10	8
Lakše ozlijeđene osobe	49	35	32

Iz tablica i grafikona je vidljivo da su mladi vozači sudjelovali u velikom broju prometnih nesreća sa smrtnim posljedicama i to čak 30% u 2017.-oj godini. U 2016. godini mladi vozač skrivio je jednu prometnu nesreću u kojoj su smrtno stradale 4 osobe pa statistički izgleda da se broj prometnih nesreća sa smrtnim posljedicama smanjio ali nije tako. Kada se uzme u obzir da mladih vozača ima oko 8% od ukupnog broja vozača to je poražavajući pokazatelj.

2. MLADI VOZAČI VARAŽDINSKE ŽUPANIJE O UZROCIMA PROMETNIH NESREĆA

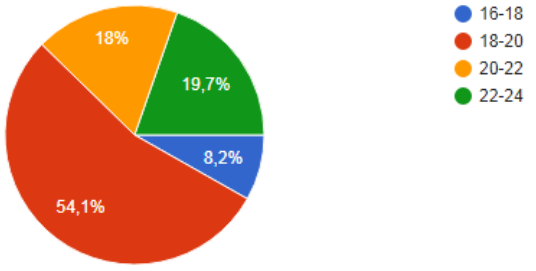
2.1. Prikupljanje podataka anketiranjem

Anketiranje je provedeno pomoću google diska. Anketa se sastojala od 20 pitanja i bila je anonimna. Ispitanici su polaznici različitih autoškola, učenici Strojarske i prometne škole te nasumično odabrani mladi vozači kako bi dobili što različitiji uzorak.

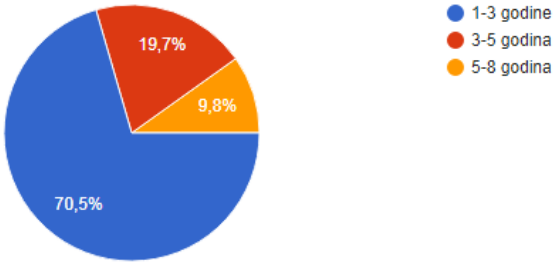
2.2. Pregled i analiza podataka

U anketi su sudjelovala 62 „mladih vozača“. Od toga 45 muških i 17 ženski. Najviše njih u dobi od 18-20 godina sa vozačkim stažem od 1-3 godine kao što je prikazano u grafikonima.

Grafikon 1. Starost ispitanika



Grafikon 2. Vozački staž ispitanika

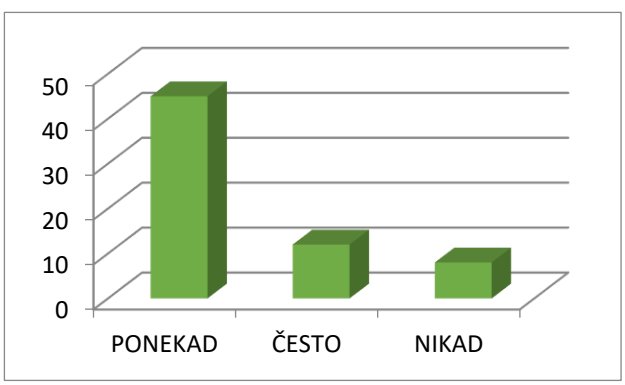


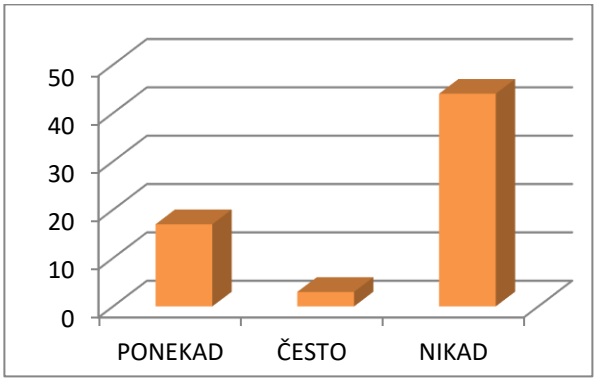
Većina ispitanika vozilo koristi svaki dan ili nekoliko puta tjedno i to putujući na kratkim i srednje dugim relacijama do 100 km.

2.3. Usporedba statističkih podataka i podataka dobivenih anketiranjem

Statistički podaci na području Varaždinske županije i na području Republike Hrvatske pokazuju kako mladi vozači često sudjeluju u prometnim nesrećama, a najčešće zbog nepropisne i neprimjerene brzine, nepoštivanja prednosti prolaska i alkohola kako je prikazano u tablicama pod točkom 2. U narednim grafikonima prikazani su rezultati anketiranja mladih vozača.

Grafikon 3. Vožnja brzinom većom od dopuštene Grafikon 4. Konzumiranje alkohola





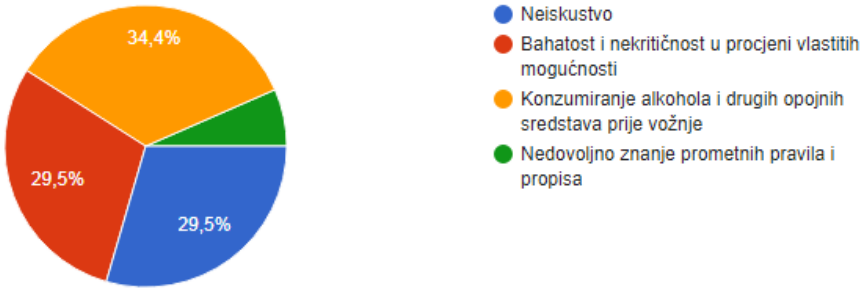
Prema rezultatima ankete oko 40% ispitanika vozi u večernji izlazak vikendom, a njih 30% konzumira alkohol prilikom vožnje dok brzinom većom od dopuštene ponekad ili često vozi njih gotovo 90%.

S obzirom da 27 ispitanika često vozi u večernji izlazak, a njih 20 konzumira alkohol tokom tog izlaska možemo zaključiti da su ***dvije trećine mladih vozača pod utjecajem alkohola.***

Rezultati anketiranja u potpunosti se slažu sa statističkim podacima koji pokazuju da su najčešći uzroci prometnih nesreća brzina i alkohol te nedovoljno iskustvo kod mladih vozača.

Iz odgovora na pitanje „Što smatraš najvećim problemom mladih u prometu?“ vidimo da su mladi vozači svjesni svojih slabosti ali nažalost većina se i dalje neodgovorno ponašaju u prometu.

Grafikon 5. Problemi mladih vozača u prometu



4.PRIJEDLOZI ZA POBOLJŠANJE SIGURNOSTI MLADIH U PROMETU

Prema statističkim podacima i podacima dobivenim anketiranjem najveći problemi kod mladih vozača javljaju se u nedovoljnom znanju prometnih pravila i propisa, konzumaciji alkohola prilikom vožnje, vožnji neprimjerenom i nepropisnom brzinom te precjenjivanju vlastitih mogućnosti pa su sukladno tome predložena poboljšanja za sigurnost mladih u prometu.

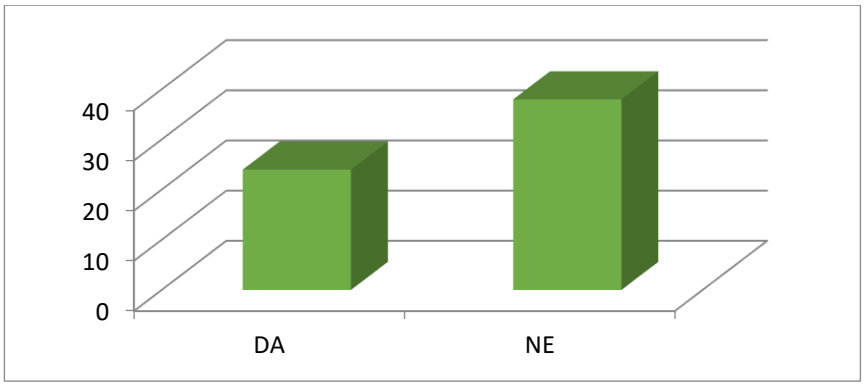
4.1. Edukacija mladih u prometu

Mladi vozači uzrokuju veliki broj prometnih nesreća te trpe fizičke, psihičke i materijalne posljedice. Činjenica je da lakše savladavaju vještinu vožnje i propise nego stariji ljudi no skloni su samodokazivanju, nemaju osjećaj odgovornosti i ozbiljnosti situacije u kojoj se nalaze kada sjedaju za volan.

Kod obuke u autoškoli bilo bi vrlo korisno da se vozačima simuliraju situacije u prometu kod prebrze vožnje da dobiju dojam koliko je smanjena širina vidnog polja, produženi put kočenja i reagiranja te kakve opasnosti proizlaze iz takve vožnje. Mladi vozači zapravo nisu svjesni koliki put prevale kod velike brzine ako samo nekoliko sekundi maknu pogled sa prometnice. Također bi trebalo prikazati reakcije i ponašanje vozača kod različitih psihofizičkih stanja (umor, alkoholiziranost, bolest). Takve situacije isprobavaju tek kad samostalno sjedaju za volan, a to vrlo često završava kobno za njih ili za druge sudionike u prometu.

Na pitanje da li smatraju da su mladi vozači opasni u prometu njih 24 odgovorilo je potvrdno kao što je prikazano u grafikonu. Smatraju da ih je autoškola dobro pripremila za sudjelovanje u prometu što se ne podudara sa statističkim podacima gdje zapravo veliki broj prometnih nesreća nastaje zbog nepoštivanja prednosti prolaska što ukazuje na slabo poznavanje temeljnih pravila i propisa.

Grafikon 6. Da li su mladi vozači opasni u prometu?



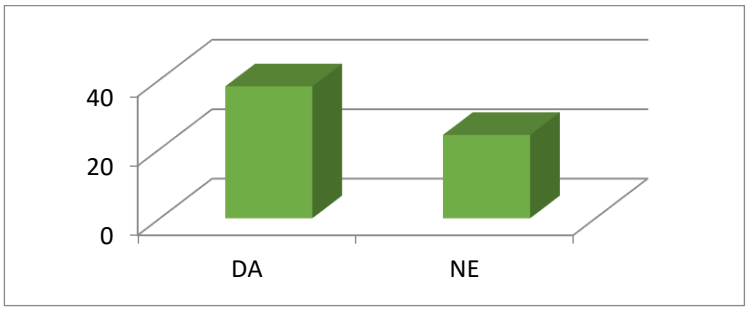
4.2. Intenzivnija policijska kontrola i strože kazne

Intenzivnija policijska kontrola posebno tokom vikenda sigurno bi pridonijela boljoj sigurnosti u prometu. Većina mladih vozača sa kratkim vozačkim iskustvom vrlo često nema vlastita primanja ni vozilo pa samim time što se kontrole najavljuju postoji bojazan ukoliko ih zaustavi policija i naplati kaznu roditelji će saznati za prekršaje i vrlo vjerojatno kazniti sa oduzimanjem vozila ili smanjenjem financijskih sredstava za život. Isto tako samo pojavljivanje policijskih vozila i službenika izaziva nelagodu i povećani oprez vozača. Kazne bi trebale biti još rigoroznije ali ne samo u financijskom smislu jer vozač takvu kaznu relativno brzo zaboravlja već rad sa osobama koje su stradale u prometnim nesrećama i završile u invalidskim kolicima te pomoć obiteljima kojima je netko stradao u prometnoj nesreći jer najefektniji je utjecaj na psihu čovjeka. Suočavanjem sa posljedicama onoga što se moglo dogoditi zbog vožnje prevelikom brzinom ili pod utjecajem alkohola malo koga će ostaviti ravnodušnim.

4.3. Treninzi sigurne vožnje

Većina ispitanika smatra kako bi polaganje sigurne vožnje pozitivno utjecalo na sigurnost mladih vozača u prometu kao što je prikazano u grafikonu.

Grafikon 7. Polaganje sigurne vožnje nakon 1 godine vozačkog staža



Cilj treninga sigurne vožnje jest osvijestiti vozače o svakodnevnim opasnostima koje vrebaju ne samo u prometu već i u vozilima te ih naučiti pravodobnom uočavanju i procjeni, a samim time i ispravnom reagiranja u različitim situacijama. Učestalim ponavljanjem i isprobavanjem vožnje u različitim uvjetima vozač stječe vještinu i sigurnost snalaženja u kritičnim situacijama.

Razvijene zemlje prepoznale su važnost prevencije prometnih nesreća te se treninzi sigurne vožnje obavezno moraju položiti nakon 1 godine vozačkog staža. Kod nas to još uvijek nije praksa ali se polako počela uvoditi.

5. ZAKLJUČAK

Na temelju vlastitih opažanja, obradom statističkih podataka PU varaždinske i provođenjem ankete među mladim vozačima utvrđeno je da su mladi vozači opasni u prometu.

Statistički podaci PU varaždinske praćeni kroz petogodišnje razdoblje pokazuju da se broj prometnih nesreća u kojima su sudjelovali mladi vozači smanjuje, a istovremeno se broj poginulih osoba u tim prometnim nesrećama povećava.

Od ukupno 10 poginulih osoba u 2015. godini 2 osobe su poginule u prometnoj nesreći sa mladim vozačima što čini 20% ukupnog broja poginulih, u 2016. godini od 16 poginulih, 4 osobe usmrtio je mladi vozač što je 25% od ukupnog broja dok je u 2017. godini od ukupno 9 poginulih, troje poginulo u prometnim nesrećama sa mladim vozačima što čini 30% od ukupnog broja poginulih u toj godini u Varaždinskoj županiji. Ako uzmemo u obzir da u ukupnom broju vozača mladih ima oko 8% rezultati su poražavajući.

Najčešći uzroci prometnih nesreća sa mladim vozačima su nepropisna i neprimjerena brzina, nepoštivanje prednosti prolaska i alkohol.

Anketiranjem mladih vozača dobiveni su rezultati koji se gotovo u potpunosti slažu sa statističkim podacima. Mladi vozači smatraju se opasnima u prometu prvenstveno zbog vožnje neprimjerenom i nepropisnom brzinom, zbog neiskustva, konzumacije alkohola i radi bahatosti i nekritičnosti u procjeni vlastitih mogućnosti. Većina ispitanika ponekad i često vozi nepropisnom brzinom, a svaki treći mladi vozač prilikom izlaska vikendom konzumira alkohol.

Od ukupno njih 67, 15-ero je sudjelovalo u prometnoj nesreći dok je njih 9 bilo odgovorno za tu prometnu nesreću, kada uzmemo u obzir da većina njih ima 1-3 godine vozačkog staža statistika potkrjepljuje rezultate.

Takvo postojeće stanje zahtjeva određene mjere koje će poboljšati stanje sigurnosti mladih u prometu.

Prvi dio rješenja je kvalitetnija obuka u autoškolama gdje polaznici na simulatoru vožnje isprobavaju voziti u različitim uvjetima pri različitim brzinama i postaju svjesni kako se širina vidnog polja pri velikoj brzini smanjuje, koliko je produžen zaustavni put i koje sve opasnosti mogu nastati iz takve vožnje. U razvijenijim zemljama to je uobičajeno jer su svjesni potrebe osvještavanja mladih o opasnostima koje ih čekaju kad izađu na prometnicu.

Drugi dio rješenja su učestalije kontrole posebno vikendom i rigoroznije kazne za mlade vozače. Osim financijskih kazni i oduzimanja vozačke dozvole trebali bi pomagati osobama stradalim u prometnim nesrećama koji su završili u invalidskim kolicima ili obiteljima u kojima je netko smrtno stradao u prometnoj nesreći kako bi bili direktno suočeni sa posljedicama koje su mogle nastati ili su nastale iz njihovog neodgovornog i bahatog ponašanja.

Treći dio rješenja je obavezno polaganje sigurne vožnje nakon 1 godine vozačkog staža da mladi vozač osjeti opasnosti koje proizlaze iz vožnje po mokroj, zaleđenoj cesti najčešće prevelikom brzinom, a i bolje svlada vještinu upravljanja vozilom posebno u kritičnim situacijama.

Takva rješenja pokazala su se efikasnim u razvijenijim zemljama, a ako je spašen samo jedan ljudski život to se i isplati.

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ZAKONI, PRAVILNICI, BILTENI

1. Zakon o sigurnosti prometa na cestama NN 67/8, 48/10, 74/11, 80/13, 158/13, 92/14, 64/15, 108/77 na snazi od 16.11.2017. godine
2. Bilten o sigurnosti cestovnog prometa 2018., Zagreb 2019.
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4. Bilten o sigurnosti cestovnog prometa 2016., Zagreb 2017.
5. Bilten o sigurnosti cestovnog prometa 2015., Zagreb 2016.
6. Statistički podaci PU varaždinske

STROJARSKA I PROMETNA ŠKOLA VARAŽDIN, Varaždin, 10/06/2021.
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"Interdisciplinarity of Logistics and Transport"

TRAFFIC ACCIDENTS OF YOUNG DRIVERS IN VARAŽDIN COUNTY

Abstract:

Everyday life requires overcoming spatial distances in different ways. Accelerated development of traffic and increased motorization, along with numerous advantages, also has an undesirable consequence, which is a reduction of safety. Traffic accidents, besides individual tragedies, also represent great losses for society.

Young drivers cause a large number of traffic accidents, die and suffer psychological, physical and material consequences.

According to the available data, the Varaždin County recorded a decline in the total number of traffic accidents and fatalities. The number of traffic accidents involving young drivers has decreased but the number of fatalities in these traffic accidents has increased.

The aim of this paper is to investigate the most common causes of traffic accidents involving young drivers in the Varaždin County and suggest possible solutions to improve safety.

The researsch will be conducted on the basis of statistical data and by surveying young traffic participants. By comparing data from these sources, proposals for improving the safety of young people in traffic will be generated.

Key words: *safety, traffic accidents, young drivers, causes of traffic accidents, consequences of traffic accidents*

1. INTRODUCTION

Young drivers represent a risk group of traffic participants causing a large number of traffic accidents due to their inexperience and overestimation of their own capabilities. Engineering and Traffic School in Varaždin educates Road traffic technicians, Freight-forwarding and logistics technicians and Motor vehicle drivers in the traffic sector. A driver who has acquired a certain education respects traffic rules and regulations and takes other road users seriously. In driving, such driver does not impose himself on others, but tries to help other drivers to avoid a car accident.

Learning provides knowledge for the normal traffic flow. This knowledge includes knowledge of laws and regulations, knowledge of vehicle movement and knowledge of one's own abilities. The goal of the school is to educate young responsible drivers who will be aware of the dangers in traffic and the possibilities of their prevention. In order to find out what the biggest problems regarding young people in traffic are, a survey among young drivers was conducted and the statistical data of the Varaždin Police Department were processed. Based on the obtained data, possible solutions for the prevention of traffic accidents with young drivers will be proposed.

2. TRAFFIC ACCIDENTS INVOLVING YOUNG DRIVERS IN VARAŽDIN COUNTY

According to the Road Traffic Safety Law, a "young driver" is a driver of a motor vehicle up to the age of 24 who has a driver's license issued in the territory of the Republic of Croatia.

2.1. Traffic accidents statistics

In the last few years, statistics of traffic accidents with young drivers have been addiotionally kept in the Republic of Croatia. According to statistics, a large number of young drivers participate in serious traffic accidents with fatalities, where the most common causes are improper and inappropriate speed, taking away the priority of passing and alcohol. The largest number of traffic accidents with young drivers occurs at weekends when they consume alcohol when going out, most often on Saturdays.

Given the time of the day, the largest number of traffic accidents occurs between 2 pm and 4 pm, and the most severe consequences are between 8 pm and 10 pm and 2 am to 4 am in the morning at the time of departure and return from a night out.
The following tables show the statistical data kept by the Varaždin Police Department. The data are related to traffic accidents in which young drivers have been involved in the last five years, their causes and consequences.

Table 1. Traffic accidents in Varaždin County

Year	2015.	2016.	2017.	2018.	2019.
Total number of traffic accidents	1186	1212	1247	1260	987
With fatalities	10	13	9	8	7
With injured persons	375	394	398	329	282

Table 1 shows that the total number of traffic accidents in the Varaždin County varied, or that in 2017 and 2018 it increased, and in 2019 it decreased and is the lowest in the last 5 years. The results from Table 2 are worrying, as it is shown that an extremely large number of traffic accidents, on average about 10% of the total number, are caused by drivers with a short driving experience of 0-5 years, which shows that inexperience and overestimation of driving skills are very dangerous in traffic.

Table 2. Traffic accidents in the Varaždin County with drivers with short driving experience involved, including large percentage of young drivers

Year Driving experience	2015.	2016.	2017.	2018.	2019.
0-2 years	88	101	95	103	87
3-5 years	42	38	39	45	40

Table 3. Traffic accidents in Varaždin County in which young drivers participated

Year	2015.	2016.	2017.
Total number of traffic accidents	65	46	43
With fatalities	2	1	3
With injured persons	63	45	40

The table shows that young drivers caused fewer traffic accidents in 2017 than in previous years, but the number of traffic accidents with fatalities in which they participated, increased. It is also evident that there are injured people in almost every traffic accident, which indicates the severity of the traffic accidents in which they were involved. Such traffic accidents have a very intense psychological effect on the driver and, in the case of as yet unformed personalities and if the young driver was responsible for this traffic accident, it leaves consequences for the rest of their life.

Table 4. Number of registered drivers in the Republic of Croatia by age

Driver's age	Drivers registered	Percentage %
Up to 18 years	12 120	0,5
19-24 years	183 330	7,8
25-34 years	427 062	18,1
35-44 years	510 889	21,7
45-54 years	508 311	21,6
55-64 years	475 856	20,2
65 and over	301 368	12,8
Total	2.348.794	100

The table shows that young drivers make only 7,9% of the total number of registered drivers in the Republic of Croatia.

2.2. Causes of traffic accidents 4

Table 5. Causes of traffic accidents caused by young drivers in Varaždin County

Causes/year	2015.	2016.	2017.
Improper and inappropriate speed	22	23	25
Alcohol	21	10	18
Other causes	22	13	0

Statistical data in the Republic of Croatia and the Varaždin County show that the main causes of traffic accidents involving young drivers are improper and inappropriate speed, alcohol and taking away the priority of passing, that is, insufficient knowledge of traffic rules and regulations.

2.3. Consequences of traffic accidents

Table 6. Traffic accidents in Varaždin County with regard to the consequences

Year	2015.	2016.	2017.	2018.	2019.
Fatalities	10	16	9	8	7
Severely injured	103	91	89	75	54
Slightly injured	393	414	459	356	307

The table and graph show that the number of fatalities in the Varaždin County decreased compared to 2015 and 2016, only the number of minor injuries increased in 2017, which is causally related to the number of traffic accidents. In the last three years, the number of injured people has been declining, as has the total number of traffic accidents.

Tablica 7. Traffic accidents in Varaždin County, with young drivers involved, with regard to the consequences

Year	2015.	2016.	2017.
Fatalities	2	4	3
Severely injured	14	10	8
Slightly injured	49	35	32

The tables show us that young drivers participated in a large number of traffic accidents with fatal consequences, as much as 30% in 2017. In 2016, a young driver caused one traffic accident in which 4 people were killed, so statistically it seems that the number of traffic accidents with fatal consequences has decreased, but this is not the case. Considering that young drivers make up about 8% of the total number of drivers this is a devastating indicator.

3. YOUNG DRIVERS OF VARAŽDIN COUNTY ABOUT THE CAUSES OF TRAFFIC ACCIDENTS

3.1. Gathering data by surveying

The survey was conducted using google disk. The survey consisted of 20 questions and was anonymous. The respondents were students of different driving schools, students of the Engineering and Traffic School and randomly selected young drivers, in order to get sample as different as possible.

3.2. Data review and analysis

62 "young drivers" took part in the survey. Of these, 45 were males and 17 females. Most of them are aged 18-20 with a driving experience of 1-3 years as shown in the charts.

Chart 1. Age of respondents

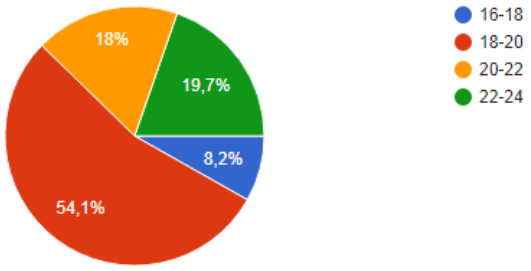
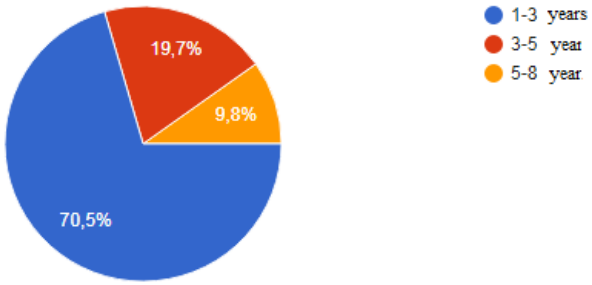


Chart 2. Respondents driving experience



Most respondents use the vehicle every day or several times a week, travelling short and medium distances up to 100 km.

3.3. Comparison of statistical data and survey data

The following charts show the young drivers survey results. Statistical data in the Varaždin County and in the Republic of Croatia show that young drivers often participate in traffic accidents, most often due to improper and inappropriate speed, disregard for the priority of passing and use of alcohol as shown in the tables under item 2. The following charts show the results of surveying young drivers.

Chart 3. Driving at a speed higher than allowed

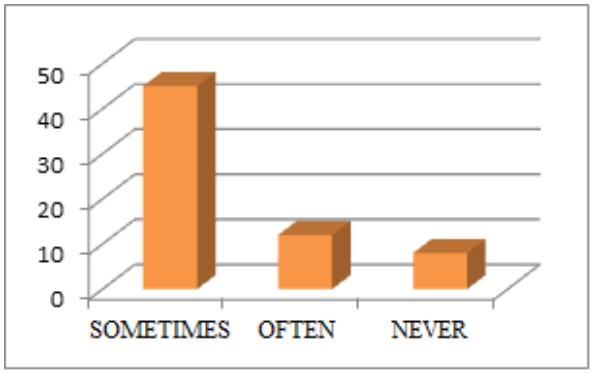
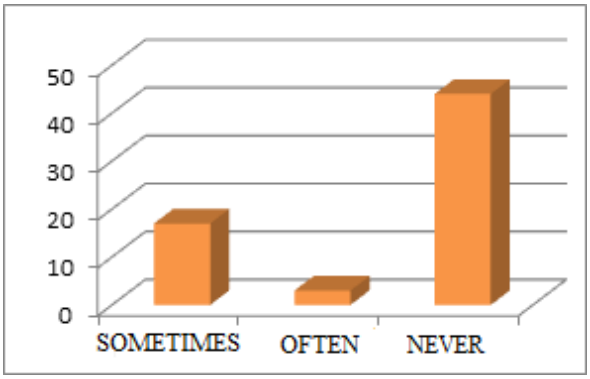


Chart 4. Alcohol consumption



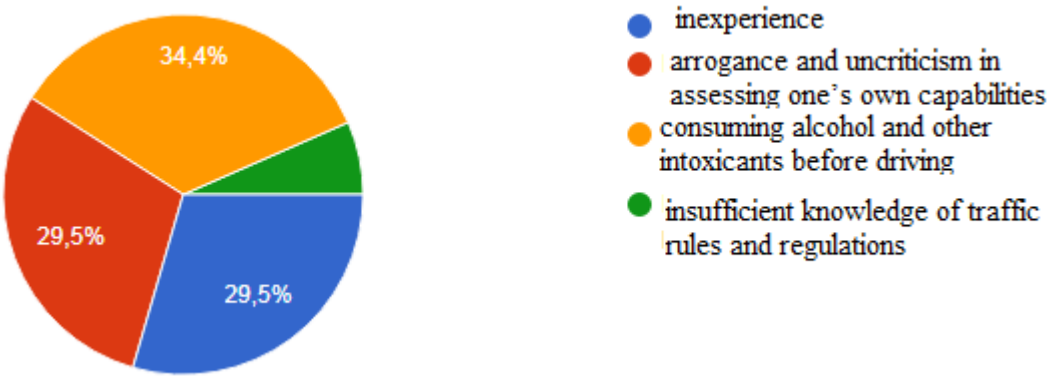
According to the survey results, about 40% of respondents drive to spend an evening out at weekends, and 30% of them consume alcohol while driving, while almost 90% of them sometimes or often drive at a speed higher than allowed.

Given that 27 respondents often drive on an evening out, and 20 of them consume alcohol during that time, we can conclude that ***two-thirds of young drivers are under the influence of alcohol***.

The results of the survey are fully in line with statistics which show that the most common causes of traffic accidents are speed, alcohol and insufficient experience among young drivers.

From the answer to the question "What do you consider the biggest problem of young people in traffic?", we can see that young drivers are aware of their weaknesses, but unfortunately most of them still behave irresponsibly in traffic.

Chart 5. Problems of young drivers in traffic



4. SUGGESTIONS FOR IMPROVING OF YOUTH SAFETY IN TRAFFIC

According to statistical data and data obtained from the survey, the biggest problems for young drivers are insufficient knowledge of traffic rules and regulations, alcohol consumption while driving, driving at inappropriate and improper speeds and overestimating their own capabilities. Accordingly, improvements for youth safety in traffic have been proposed.

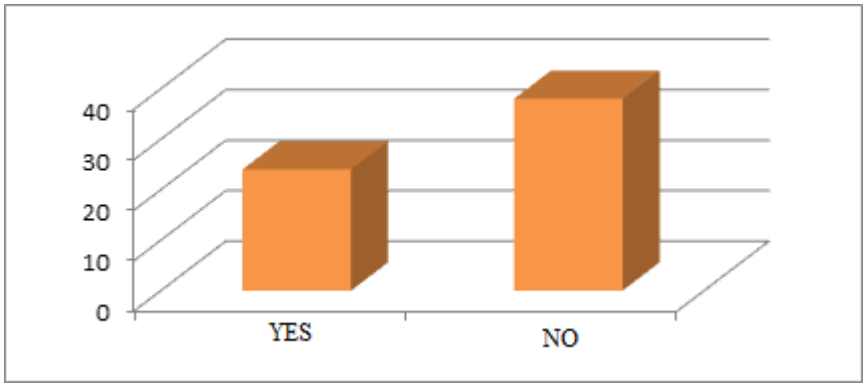
4.1. Education of young people in traffic

Young drivers cause a large number of traffic accidents and suffer physical, mental and material consequences. The fact is that they master driving skills and regulations easier than older people, but they are prone to self-assertation, they do not have a sense of responsibility and the seriousness of the situation they find themselves in, when they sit behind the wheel.

In driving school training, it would be very useful for drivers, if different traffic situations were simulated, like when driving too fast, to get an impression of how much the field of view is reduced, how long the braking and response path is, and what dangers arise from such driving. Young drivers are not really aware of how far they travel at high speeds if they take their eyes off the road for just a few seconds. It should also show them the reactions and behavior of drivers in different psychophysical conditions (fatigue, alcoholism, illness). They encounter such situations only when they sit behind the wheel on their own, and that very often ends fatally for them or for other road users.

When asked if they consider young drivers to be dangerous in traffic, 24 of them answered affirmative as shown in the chart. They believe that the driving school has prepared them well for participation in traffic, which does not match the statistics where in fact a large number of traffic accidents occur due to disregard for the priority of passing, which indicates poor knowledge of basic rules and regulations.

Chart 6. Are young drivers dangerous in traffic?



4.2. Intensified police control and stricter penalties

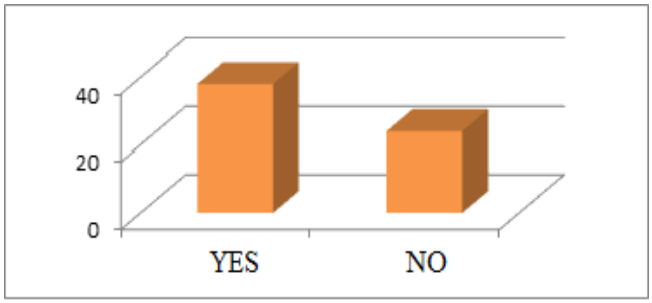
Intensified police control, especially at weekends, would certainly contribute to better traffic safety. Most young drivers with short driving experience often do not have their own income or vehicle, so with the mere announcement of control, there exists the fear that if they are stopped by the police and fined, parents will find out about the offenses and most likely they will be punished with getting banned from driving or with reduction of financial means.

Likewise, the mere appearance of police vehicles and officers causes discomfort and increased caution to drivers. Penalties should be even more rigorous, but not only financially, because the driver forgets such penalty relatively quickly, but working with people who were injured in traffic accidents and ended up in wheelchairs, and helping families whose members were injured or killed in a car accident, because the most effective influence is the one on the human psyche. Facing the consequences of what could have happened due to speeding or driving under the influence of alcohol, few will be left indifferent.

4.3. Safe driving training

Most respondents believe that taking the safe driving exam would have a positive impact on the safety of young drivers in traffic as shown in the chart.

Chart 7. Taking the safe driving exam after 1 year of driving experience



The goal of safe driving training is to make drivers aware of the everyday dangers lurking not only in traffic but also in vehicles and to teach them timely observation and assessment, and thus the correct response in

various situations. By frequently repeating and testing driving in different conditions, the driver acquires the skill and self-confidence in coping with critical situations.

Developed countries have recognized the importance of accident prevention and safe driving training must be passed after 1 year of driving experience. In our country, this is still not a practice, but it has slowly begun to be introduced.

5.CONCLUSION

Based on our own observations, by processing the statistical data of the Varaždin Police Department and conducting a survey among young drivers, it was concluded that young drivers are dangerous in traffic.

Statistical data of the Varaždin Police Department, monitored over a five-year period, show that the number of traffic accidents involving young drivers is decreasing, but at the same time the number of people killed in these traffic accidents is increasing.

Out of a total of 10 fatalities in 2015, 2 people died in a traffic accident with young drivers, which is 20% of the total number of fatalities. In 2016, out of 16 fatalities, 4 people were killed by a young driver, which is 25% of the total number. In 2017, out of a total of 9 fatalities, three people died in traffic accidents with young drivers, which is 30% of the total number of fatalities in that year in the Varaždin County. If we consider the fact that in the total number of drivers, there are about 8% of young drivers, the results are devastating.

The most common causes of traffic accidents with young drivers involved are improper and inappropriate speed, taking away the priority of passing and alcohol.

The survey taken among young drivers yielded results that are almost completely in line with the statistics. Young drivers are considered dangerous in traffic primarily due to driving at an inappropriate and improper speed, due to inexperience, alcohol consumption and due to arrogance and uncritical assessment of their own abilities. Most respondents sometimes and often drive at an improper speed, and every third young driver consumes alcohol when going out at weekends.

Out of a total of 67 young drivers surveyed, 15 were involved in a car accident while 9 of them were responsible for that car accident. Considering the fact that most of them have 1-3 years of driving experience, the statistics corroborate the results.

Such existing situation requires certain measures that will improve the safety of young people in traffic.

The first part of the solution is better training in driving schools where participants in the driving simulator try to drive in different conditions at different speeds and become aware of how the width of the field of view decreases at high speed, how long the stopping distance is and what dangers can arise from such driving. In more developed countries, this is a common practice because they are aware of the need to make young people aware of the dangers that await them when they hit the road.

The second part of the solution are more frequent controls, especially at weekends, and more rigorous penalties for young drivers. In addition to financial penalties and revocation of driver’s licenses, they should help people injured in road accidents who ended up in wheelchairs, or families in which someone was killed

in a car accident in order to be directly confronted with the consequences that have arisen from their irresponsible and arrogant behavior.

The third part of the solution is the obligatory taking of the safe driving exam after 1 year of driving experience, so that the young driver feels the dangers arising from driving on wet, icy roads, usually too fast, and to master the skill of driving better, especially in critical situations.

Such solutions have been proved to be effective in more developed countries, and if only one human life is saved, all that pays off.

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J.U. SREDNJA ŠKOLA ZA SAOBRAĆAJ I KOMUNIKACIJE SARAJEVO
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RFID TEHNOLOGIJE I PRIMJENA U POŠTANSKOM SISTEMU

SAŽETAK:

Dinamičan razvoj mobilnih komunikacija prati njihova široka primjena u području poštanskih usluga čime se povećava razina poštanskih usluga i poboljšava tržišna pozicija poštanskih operatora. Zemlje EU su donijele odluke o primjeni naprednih tehnologija u oblasti poštanskog saobraćaja kako bi se povećala konkurentnost nacionalnih poštanskih operatora. Primjena novih tehnologija u poštanskom saobraćaju treba povećati učinkovitost operacija u poštanskom saobraćaju i osigurati interoperabilnost. Da bi se osigurala interoperabilnost neophodna je standardizacija informacijskih i komunikacijskih tehnologija u poštanskom saobraćaju koja bi omogućila razmjenu podataka, informacija i znanja.
Primjena RFID tehnologije omogućava snažnu podršku za poboljšanje upravljanja procesima u poštanskom saobraćaju. RFID tagovi i čitači nemaju pokretnih djelova stoga ne zahtijevaju održavanje. Mogu se očitavati i u njih se mogu upisivati podaci koji mogu biti daleko sadržajniji nego kod drugih tehnologija automatske identifikacije. Aplikacije gde je potrebna sigurna i jedinstvena identifikacija i dugotrajnost i izuzetna otpornost identifikatora na razne specifične uticaje okoline, a nije potrebna direktna vidljivost, idealne su za primjenu RFID tehnologije.

U ovom radu predstavljena je RFID tehnologija i njena primjena u poštanskom sistemu.

Ključne riječi: inteligentna pošiljka, RFID tehnologija, RFID transponder, RFID tag

UVOD

Poštanski servis je prepoznao promjene koje se dešavaju u poslovnom okruženju koja zahtijevaju nova tehnološka rješenja. Postojeći poštanski sistem koji raspolaže sa velikom količinom podataka ali ograničenim brojem potrebnih informacija o pošiljci, se mora transformirati u smjeru da tokove pošiljaka prate tokovi informacija o pošiljkama koje će biti dostupne poštanskim službenicima i korisnicima poštanskih usluge. Sa stvarnovremenskim podacima o trenutnom stanju pošiljke, poštanski službenici i korisnici usluga mogu donositi kvalitetne odluke kako bi poboljšale procese i otklonili uočene nedostatke.

U poštanskom sistemu je prepoznata potreba za pružanje informacija klijentima o pošiljkama kao i potreba korištenja tih informacija u cilju poboljšanja upravljanja operacijama u poštanskom saobraćaju. Pošta mora valorizirati vrijednost informacija o pošiljkama. Povećanje vrijednosti poštanske pošiljke korištenjem informacije i uvidom u proces isporuke poštanskih pošiljaka povećava se vrijednost za korisnika i podiže operativna učinkovitost.

Velika raznolikost RFID sistema omogućuje izrazito velik broj primjena, koji s vremenom i tehnološkim napretkom sve brže raste. Ugrađivanje RFID tagova u doslovno sve što okružuje ljude, od donjeg rublja, preko automobila i vlakova, do kućnih ljubimaca pa i u same ljude, obećava brojne pogodnosti i nove dosad neslućene mogućnosti - lagodnije i učinkovitije obavljanje svih svakodnevnih poslova. Prednosti koja pruža RFID tehnologija, posebno sigurnost i jedinstvena identifikacija, sve više imaju primjenu i u poštanskim procesima.

1. INTELIGENTNA POŠILJKA

1.1. Razvoj inteligentne poštanske pošiljke

Obzirom na promjene koje se očekuju u razvoju tehnologije i globalizacije tržišta očekuju se značajne promjena i na području tržišta poštanskih usluga koje su povezane sa novim zahtjevima korisnika poštanskih usluga, deregulacije tržišta poštanskih usluge što rezultira zahtjevima za većom efikasnošću i efektivnošću poštanskog servisa.

Poštanski službenici se trebaju prilagoditi okruženju u kojem uloga informacije nije vezana samo za pravljenje izvještaja o prošlim događajima. Razvoj poštanskog servisa ide u smjeru da informacije budu dostupne poštanskim službenicima tako da im omogućavaju neposredan uvid u kretanje pošiljke.

Neophodno je razvijati **sistem inteligentne pošiljke** koji će osigurati da se prikupljene informacije o pošiljkama koje su hijerarhijski organizirane u poštanskom sistemu učine dostupnim poštanskim djelatnicima koji će na temelju takvih informacija i zahtjeva kupaca donositi poslovne odluke te na taj način promijeniti postojeće poslovno okruženje u kojem kupcu poštanskih usluga nisu bile dostupne on-line informacije o njegovoj pošiljci.

Cilj sistema inteligentne pošiljke je da omogući korisniku poštanskih usluga vidljivost svoje pošiljke na cijelom putu od polazišta do odredišta što podrazumijeva primjenu inteligentnog poštanskog bar koda te potrebnu infrastrukturu koja će proširiti vidljivost pošiljaka u poštanskoj mreži. Postojeći tokovi pošiljaka u poštanskom saobraćaju će pratiti tokovi podataka o tim pošiljkama koje će biti dostupne korisnicima poštanskih usluga i djelatnicima pošte.

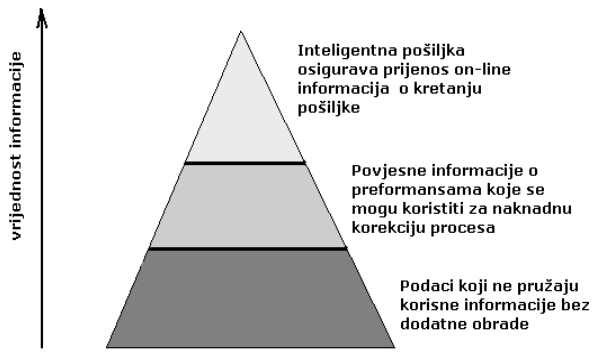
Poboljšanje poštanske usluge korištenjem informacija o pošiljci i pružanje tih informacija korisnicima poštanskih usluga povećava vrijednost poštanske usluge te podiže učinkovitost poštanskog sistema u cjelini.

1.2. Značaj informacija o pošiljci u poštanskom saobraćaju

Poštanska služba raspolaže velikom količinom podataka. Međutim podatak koji nije obrađen je sam po sebi rijetko koristan i rijetko pruža informaciju koja se može koristiti u donošenju odluka. Tek nakon razumijevanja podatka te njegovog povezivanja sa jedinicama mjerenja koji se odnose na stvaranje poslovnih odluka podatak postaje korisna informacija. U tom trenutku podatak se pretvara u informaciju i postaje vrijedna za davatelja usluga i njihovog korisnika. Ako informacija nije pravodobno dostupna, njena vrijednost se znatno umanjuje i ima samo povijesnu važnost koja se može iskoristiti u kreiranju različitih izvješća analizama provedenih aktivnosti u sistemu.

Postojeće poštanske usluge već daju određene informacije svojim djelatnicima i korisnicima usluga zahtijevajući potvrdu isporuke i potvrdu prijema informacija. Međutim, korisnici poštanskih usluga zahtijevaju informacije prije isporuke koje su također potrebne poštanskim djelatnicima koji vrše dostavu ili isporuku pošiljke. Korisnici usluga i djelatnici pošta zahtijevaju da im podaci i informacije budu prezentirani na razumljiv način tako da oni u realnom vremenu mogu donositi odluke koje će eliminirati potencijalne negativne učinke. Konkurentske tvrtke već koriste informacije o pošiljkama koje su na dohvat ruke njihovim djelatnicima i korisnicima njihovih usluga.

Pojam "sistem inteligentne pošiljke" odnosi se na prikupljanje i prenošenje informacija o svakoj pošiljci u realnom vremenu za poštanskog djelatnika i korisnika poštanskih usluga koje mogu pozitivno utjecati na provođenje njihovih operacija. Kupci koriste ove informacije na različite načine ovisno o tome koja je to karika u njihovom lancu snabdijevanja. Vlasnici pošiljke na temelju informacija o kretanju pošiljke mogu objektivno cijeniti svoje dobavljače i poštu kao davatelja usluge. Ovi podaci mogu poslužiti za utvrđivanja smetnji u lancu opskrbe te pomoći njihovom eliminiranju. Podaci o svakom komadu pošiljke omogućuju da se utvrdi vrijeme isporuke ili eventualno razlog vraćanja pošiljke pošiljatelju.



Provajderi poštanskih usluga MSP (Mail service providers) pronalaze vrijednost u dobivenim informacijama od sistema inteligentne pošiljke. Detaljnim mjerenjem kvalitete usluga može se kontrolirati način pripreme pošte za slanje sa ciljem poboljšanja kvalitete pružene usluge.

Slika 1. Vrijednost informacije o pošiljci

1.3. Inteligentne pošiljke u savremenom tehnološkom okruženju

Poboljšanje poštanskih usluga se ostvaruje kroz automatizaciju i mehanizaciju prerade poštanskih pošiljaka, inteligentno kodiranje pošiljaka te procese grupiranja pošiljaka. Strukturu koda je sačinjava veliki broj informacija koje su strojno čitljive a kodovi se čitaju automatski manuelno kao dio tehnološkog procesa prijenosa pošiljki osiguravajući zaštitu privatnosti poštanskih pošiljaka. Putem inteligentnog bar koda poštanskih pošiljki broj nesuglasnih kodova na komadima pošiljki i stvarnim sadržajem pošiljki je smanjen na najmanju moguću mjeru, što odgovara dobroj poslovnoj praksi i zahtjevima kupaca. Potrebno je istražiti troškove stvaranja i čitanja inteligentnog koda u okviru poštanskog sistema i od strane korisnika poštanskih usluga. Prikupljanje podataka i informatička infrastruktura za prikupljanje, prijenos i pohranu informacija je automatizirana i integrirana sa razvijenim softwerom koji omogućava praćenje informacija od polazišta do odredišta uz mogućnost pristupa tim informacijama od strane poštanskih službenika i korisnika poštanskih usluga.

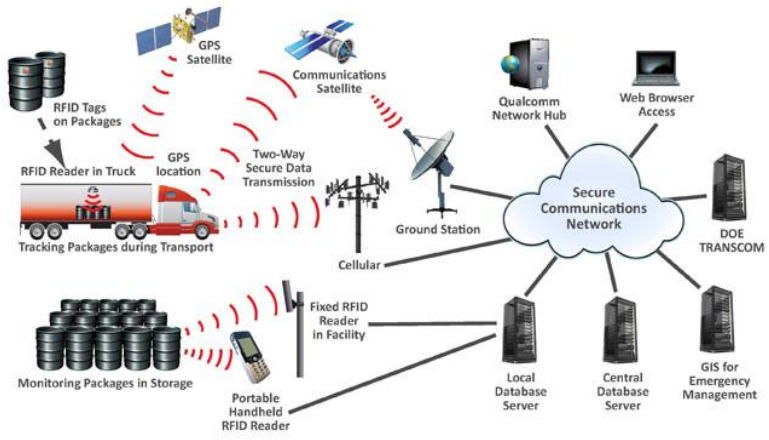
Iako do potpune realizacije inteligentnih poštanskih pošiljki i ostvarenja koristi koje se očekuju njihovom primjenom može proteći niz godina, u poštanskom saobraćaju je ostvaren značajan napredak u pravcu jedinstvene identifikacije pošiljaka i njihovog grupiranja te povećanje kvalitete adresiranja pošiljaka. U narednom periodu poštanski servis će se fokusirati na korištenje prednosti inteligentne pošiljke kojima će se poboljšavati performanse poštanskog sistema, stvarati novi proizvodi u poštanskom saobraćaju te racionalizirati poslovanje što će korisnici poštanskih usluga prepoznavati kao novu vrijednost pruženih usluga.

Inteligentna poštanska pošiljka nudi mogućnosti nadogradnje postojećih servisa omogućujući pošiljatelju korištenje movih mogućnosti inteligentne pošiljke (dopisnica s plaćenom poštarinom koja se može slati bez naknadnog lijepljenja poštanske marke). Postojeći poštanski proizvodi će biti konkurentniji korištenjem informacija kojima će se snižavati troškovi povećati njihove performanse uz povećanje učinkovitosti poštanskog saobraćajna te na taj način smanjujući troškove poslovanja korisnika poštanskih usluga.

2. RFID TEHNOLOGIJA

2.1. Osnove RFID sistema

U širem smislu, RFID (*Radio Frequency Identification*) sistemi su svi sistemi koji koriste frekvencijske radio valove za prikupljanje informacija za identifikaciju i praćenje objekata ili osoba. U užem smislu pod RFID sistemom podrazumijevamo sistem koji se sastoji od RFID čitača, antene, sistema za obradu podataka i RFID transponder (***trans****mitter/res****ponder***) - tag koji je nositelj informacija za identifikaciju i praćenje objekta. RFID tehnologija omogućava funkcioniranje sistema bez direktne optičke vidljivosti i po bilo kakvim vremenskim uvjetima kao i istovremeno očitavanje više tagova.
Radio frequency identification – RFID je sistem daljinskog slanja i prijema podataka pomoću RFID kartica/odašiljača. RFID kartica je dosta mali objekat koji se može zalepiti ili ugraditi u željeni proizvod i uređaj. RFID kartice sadrže u sebi antenu koja im omogućava prijem i slanje radio-talasa od RFID primopredajnika. Može se reći daje preteča RFID tehnologije jedna vrsta bubice (nastala 1945.god) koja je preko radio talasa slala signale. Izumitelj je ruski naučnik Leon Termin. Sličnu tehnologiju koristili su Britanaci u Drugom svjetskom ratu, IFF (Identification friend or foe) razvijena 1939.
Primjenu, kao i primjenu u aplikacijama za praćenje, RFID se pojavio osamdesetih godina i brzo zadobio veliku pažnju zbog svoje sposobnosti da prati pokretne objekte. Kao prefinjena tehnologija, sa neslućenim mogućnostima primjene, on se stalno razvija i spektar mogućih upotreba ove tehnologije se stalno širi. Pretpostavlja se da je prvi istraživački rad koji je objavljen djelo Hari Stokmana koji je taj rad objavio 1948. godine pod naslovom ”Komunikacija kao odraz moći” i bilo je potrebno skoro 40 godina da bi RFID kartice zaživjele u praksi.
Problem koji se danas nastoji riješiti uvođenjem nove tehnologije je – kako pratiti jedinstveni proizvod od njegovog nastanka do krajnjeg potrošača. Standardni bar-kod identifikuje samo proizvođača i proizvod, ali ne i jedinstveni artikal. Bar-kod na omotu jednog proizvoda iz palete je isti na svakom omotu svakog proizvoda sa te palete, pa je nemoguće putem samog bar-koda izdvojiti tačno određeni proizvod. RFID transponder, naprotiv, nosi identifikator – serijski broj jedinstven samo za taj specifični proizvod.



Slika 2. Sistem pozicioniranja transportnog sredstva i pošiljke[1]

[1] Izvor: https://www.automatika.rs/baza-znanja/obrada-signala/uvod-u-rfid-tehnologiju.html

Postoje mnogi načini za praćenje i identifikaciju predmeta, životinja i ljudi. Još od prvih trgovaca broji se količina robe i prate se pošiljke. Pisane oznake i razni simboli su bili korisni za identifikaciju nekoliko proizvoda ili ljudi, ali za identifikaciju stotina paketa na sat, ipak je potreban neki vid automatizacije. Bar-kod je vjerovatno najpoznatiji kompjuterski čitljiv način obilježavanja, ali svjetlost koja se koristi ispoljava neke nedostatke. Najvažnije, ona zahtijeva direktnu liniju vidljivosti, tako da predmet mora biti okrenut na pravu stranu i ništa se ne smije naći na putu između lasera i bar-koda. I ostale forme identifikacije, kakva je, na primjer, magnetna traka na kreditnim karticama, moraju biti postavljene pravilno prema čitaču kartica ili čak biti ubačene u čitač na odgovarajući način. Identifikacija uz pomoć radio talasa- RFID (*engl.* Radio Frequency Identification) je tehnologija koja veliki rast doživljava u posljednjih nekoliko godina, iako su njene osnove prisutne već nekoliko decenija. Kao i svaka ozbiljnija tehnologija, morala je da prođe period prelaska iz visoko profesionalne i "elitne" oblasti u pristupačnu, svakodnevnu upotrebu.

Slika 3. Princip rada RFID „tag"

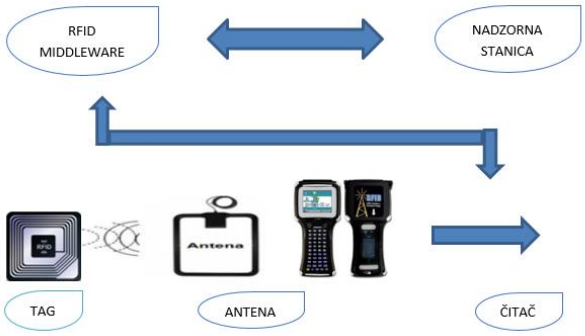
Osnovne prednosti RFID tehnologije su:

- Direktna linija nije neophodna - čitač ne zahtijeva direktnu liniju vidljivosti sa predmetom. Ovako se smanjuje vrijeme obrade proizvoda, koje bi bilo utrošeno na okretanje predmeta na pravu stranu.
- Velika brzina popisivanja predmeta - veliki broj predmeta može biti skeniran gotovo istovremeno. Kao posljedica ovoga, vrijeme potrebno za brojanje predmeta se smanjuje.
- Različite forme dijelova - RFID tagovi se proizvode u raznim veličinama i oblicima, i to omogućuje ovoj tehnologiji upotrebu u različitim situacijama i u različitim okruženjima.
- Praćenje pojedinačnih predmeta - devedesetšestobitni RFID tag omogućuje praćenje milijardi različitih predmeta.
- Mogućnost ponovnog pisanja - na neke vrste tagova može se pisati više puta. U slučaju ponovnog korišćenja kontejnera ovo je velika prednost. Takođe, dostupni su i tagovi na koje se piše samo jednom.

2.2. Primjena RFID sistema u poštanskom saobraćaju

RFID tehnologija doživjela je snažan rast i privukla svjetsku pažnju od trenutka kada je cijena RFID etiketa počela da kontinuirano pada i kada su neki od vodećih trgovinskih lanaca i Američko minstarstvo odbrane naložili svojim snadbjevačima da striktno koriste ovu tehnologiju identifikacije. Smanjenjem cijene RFID se sa područja personalne identifikacije proširio do nivoa identifikacije pojedinačnih proizvoda. Usljed toga

oblast primjene se brzo proširila na logistiku lanaca snadbjevanja, poštanske i kurirske servise kao i nadzor nad objektima velike vrijednosti.



Slika4. Primjena RFID sistema

Veoma važna činjenica za poštanku djelatnost jeste da „RFID industrije računaju na intenzivnije korištenje RFID tehnologije od strane pošta i kurirskih službi. Procjenjuje se da će do 2016 godine udio poštanskih i kurirskih servisa na tržištu RFID opreme i transpondera iznositi oko 3 milijarde dolara i to 25% u SAD, 25% u Europi i čak 50% u istočnoj Aziji. Procjena je da će tada 650 milijardi pošiljaka godišnje biti identifikovano pomoću RFID naljepnica“.

2.2.1. Kontrola sakupljanja poštanskih pošiljki iz poštanskih kovčežića

Primjenom RFID sistema moguće je automatizovati proces praćenja sakupljanja pošiljki iz poštanskih kovčežića. Princip rada je da se na svakom poštanskom kovčežiću montira tag sa jednoznačno upisanim ID kodom. Na vrećama za sakupljanje se nalazi montiran RFID mikro čitač sa memorijom dovoljnom za upis i čuvanje očitanih ID kodova sa tagova na kovčežićima. Na mjestu na kome se vrši selekcionisanje sakupljene pošte obavlja se očitavanje sadržaja mikro čitača. Na taj način je automatski zabilježen ID kod svakog poštanskog kovčežića koji je obiđen u procesu sakupljanja pošiljki.

2.2.2. Praćenje transportnih sredstava i skladišni procesi pošte

Ovaj sistem nudi i mogućnost praćenja poštanskih vozila. U slučaju da se poštanska vozila kreću između unaprjed definisanih i fiksnih odredišta i destinacija moguće je automatizovati praćenje kretanja poštanskih vozila čak i bez uticaja čovjeka. Na tag se u ovom slučaju direktno fiksira na poštansko vozilo. U trenutku dolaska i odlaska sa odredišta čitač na datoj tački u tag upisuje podatke o vremenu dolaska i vremenu odlaska. Kada se vozilo vrati na odredišnu tačku ovi podaci se automatski skidaju tokom prolaska vozila kroz ulaz objekta (preko antene i čitača).

Praćenje poštanskih vozila vezano je za upravljanje procesima unutar poštanskog skladišta. Naime, poštanska vozila ne moraju se striktno pratiti sa fiksiranim tagom, već tag može biti postavljen na neki element skladištenja (paket, paleta, kontener i dr.). Svaki paket, paleta, kontejner ili drugi elemenat

skladištenja sa fiksiranim tagom olakšava organizovanje, smještanje, pretraživanje i usmjeravanje ka korisnicima.

Čitač se nalazi na ulazu/izlazu iz magacina, i na strateškim tačkama unutar magacina. Strateške tačke unutar magcina mogu biti pristupi na pretovarnom mjestu, parkingu, mjestu punjenja gorivom i sl. U slučaju kontrole parkinga RFID tag se stavlja na vozilo ili se nalazi kod vozača, a čitač se nalazi na ulazu u parking prostor. Nailaskom vozila očitava se informacija smještena u transporderu, obrađuje i daje odgovarajuća naredba.

U upravljanje skladišnim procesima spada i identifikacija osoblja zapošljenog u skladištu. Kontrola pristupa i identifikacija osoblja sa RFID tehnologijom omogućavaju da se kontrola obavlja na beskontaktni način (bez provlačenja kroz magnetnu glavu, njenim prinošenjem čitaču ili ukucavanjem šifre koda na kodnoj tastaturi šifre brave) - dovoljno je da osoblje samo nosi sa sobom RFID tag. Ove vrste tagova su veoma raznolike. Mogu biti u obliku privjesaka za ključeve pa sve do tagova ugrađenih u ručne satove zaposlenika. Pored identifikacije osoblja u skladištu kurirskih organizacija ovaj sistem identifikacije ljudi se primjenjuje i u drugim objektima organizacije kao što su poštanske jednice, centri, izmjenične pošte, pošte carinjenja i slično. RFID sistemi imaju veliku primjenu u transportnim lancima za identifikaciju kontejnera, paleta, transportnih jedinica i zaposlenih. Primjenom ove tehnologije povećava se efikasnost, smanjuju se greške (zbog elimnisanja rada sa papirima), i povećava se kvalitet upravljanja i planiranja.

2.2.3. Praćenje pošiljaka u sistemu poštanskog saobraćaja

Sistem praćenja pošiljaka svoju obimniju upotrebu doživio je 1996. godine s ciljem poboljšanja obračuna terminalnih troškova, u međunarodnom poštanskom saobraćaju. Zadatak ovog sistema je bio da odredi što je moguće preciznije u kom trenutku poštanski operator zemlje odredišta preuzima odgovornost nad dolaznom pošiljkom. Preduslov za funkcioniranje ovog sistema je da se test pošiljka ni na koji način ne razlikuje od ostalih i da je proces prerade pošiljaka za vrijeme testiranja istovjetan onome kada nema testiranja. Primarni cilj sistema praćenja pojedinačnih pošiljaka jeste automatsko testiranje kvaliteta poštanskih usluga. Sistem se prvenstveno odnosi na međunarodni poštanski saobraćaj i na pismonosne pošiljke stope mase od 20 grama, iako su mu mogućnosti daleko veće. Osnovni elementi ovg sistema praćenja pisama su:

1. tagovi,
2. portal za praćenje (antena i čitač),
3. lokalni sistem za prikupljanje podataka i
4. centralni sistem praćenja.

Pored praćenja pojedinačnih pismonosnih pošiljaka sistem se koristi i pri praćenju- prijenosu poštanskih paketa ili novca. Prijenos novca i osiguranje depozitnih transakcija se može podići na viši nivo primjenom RFID sistema. Svaka vreća sa novcem sadrži fiksiran tag koji se očitava na depozitnoj mašini. Kada je ID kod sa taga autorizovan, otključava se prostor za smještaj novca. Klijent ubacuje vreću sa novcem u otvor i ponovo se pristupa očitavanju ID koda. Ako je ID kod ispravan klijentu se štampa i izdaje priznanica.

2.3. Prednosti RFID sistema u odnosu na barkodiranje

Ovakav način identifikacije za razliku od dosadašnjeg bar kodiranja direktno i indirektno djeluje na racionalizaciju cjelokupnog poštankog transporta. Pored toga što se pojedinačne pošiljke prate unutar instalirane RFID mreže, ogromne prednosti su i pri procesiranju pošiljaka u sortir centru. Osnovne prednosti su:

- nije potrebna optička vidljivost,
- čitanje i pisanje podataka se vrši bez ikakvog kontakta s objektom,
- praćenje cjelokupnog procesa proizvodnje kroz vreme,
- praćenje informacija u procesu kontrole,
- oblik transpondera može da bude raznovrstan, prilagođen kako pošiljkama tako i aplikaciji,
- transponder je otporan na refleksiju svijetla, a ne ometa ga ni potpuna tama,
- transponder ima jako dug životni vijek, ponovno korišćenje istog transpondera smanjuje troškove,
- transponder može omogućiti čitanje i/ili upisivanje informacija
- ubzavaju obradu poštanski pošiljaka unutar procesnog centra,
- optimiziraju raspored radnika unutar lanca prijenosa pošiljaka,
- optimiziraju sekundarne resure,
- eliminiraju greške nastale dejstvom ljudi,
- pružaju informatičku podršku upravljačkim odlukama,
- pružaju sistematičnu statističku evidenciju važnu za planiranje poštanskog saobraćaja,
- povećavaju brzinu prijenosa pošiljaka odnosno minimiziraju vrijeme prijenosa pošiljaka,
- povećavaju kvalitet usluživanja korisnika i dr.

ZAKLJUČAK

Operatori, korisnici i drugi učesnici na poštanskom tržištu nerijetko imaju različita shvaćanja kada je u pitanju kvalitet usluga. Da bi se osiguralo zadovoljstva korisnika neophodno je osigurati efikasne poslovne procese ali i zadovoljavajući stepen usluge sa tehničkog aspekta. Iz tog razloga navedeni su parametri koje je potrebno osigurati da bi se zadovoljili zahtjevi korsinika. Performanse sistema treba da omoguće ispunjenje postavljenih ciljeva u pogledu određenih karakteristika poštankog saobraćaja.

Polazeći od toga da je tehnologija procesa rada u pošti isto što i vršenje usluga, značaj uvođenja novih tehnologija ITS-a za formuliranje strategija je veoma bitan. Bez inovativne tehnologije nema uvjeta za sticanje konkurentske prednosti, a nove tehnologije se moraju promatrati kao dio poslovne konkurentske strategije zasnovane na vremenu i znanju.

Razvoj RFID tehnologije rezultira sve jeftinijom proizvodnjom opreme (transpondera, čitača), sve većom memorijom, širim dometom prenosa signala i bržim procesiranjem. Ipak, nije verovatno da će RFID uskoro sasvim da zamijeni tehnologiju zasnovanu na bar kodu. Može se pretpostaviti da će njegova upotreba da raste tamo gdje druge metode automatske identifikacije nisu efikasne. Kako smo vidjeli standardizacija kakva je omogućila rast i globalnu upotrebu bar koda, neophodna je u i RFID sistemima. U većini okruženja, RFID postiže 99.5% do 100% očitavanja u prvom skeniranju. Bez pokretnih dijelova ili optičkih komponenti, održavanje je daleko jednostavnije.

Neophodna je modernizacija poštanskog sistema, povećan stepen primjene informacijskih i komunikacijskih sistema, kao i podizanje nivoa kvaliteta pružanja usluga i reorganizacija određenih procesa, po uzoru na poštanske sisteme u drugim evropskim zemljama.

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P.I. SECONDARY SCHOOL FOR TRAFFIC AND COMMUNICATIONS SARAJEVO

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RFID TECHNOLOGIES AND USE IN THE POSTAL SYSTEM

ABSTRACT:

The dynamic development of mobile communications is accompanied by their wide application in the field of postal services, which increases the level of postal services and improves the market position of postal operators. EU countries have made decisions on the application of advanced technologies in the field of postal traffic in order to increase the competitiveness of national postal operators. The application of new technologies in postal traffic should increase the efficiency of operations in postal traffic and ensure interoperability. In order to ensure interoperability, it is necessary to standardize information and communication technologies in postal traffic that would enable the exchange of data, information and knowledge.

The application of RFID technology provides strong support for improving process management in postal traffic. RFID tags and readers have no moving parts and therefore do not require maintenance. They can be read and written into data that can be far more meaningful than with other automatic identification technologies. Applications that require secure and unique identification and the longevity and exceptional resistance of identifiers to various specific environmental influences, and do not require direct visibility, are ideal for the application of RFID technology.

This paper presents RFID technology and its application in the postal system.

Keywords: intelligent shipment, RFID technology, RFID transponder, RFID tag

INTRODUCTION

The postal service has recognized the changes taking place in the business environment that require new technological solutions. The existing postal system, which has a large amount of data but a limited amount of required shipment information, must be transformed in the direction that shipment flows are accompanied by shipment information flows that will be available to postal officials and users of postal services. With real-time data on the current status of the shipment, postal officials and service users can make quality decisions to improve processes and eliminate identified shortcomings.

The postal system has recognized the need to provide information to customers about shipments as well as the need to use this information in order to improve the management of postal operations. Mail must valorize the value of shipment information. Increasing the value of a postal item by using information and insight into the process of delivery of postal items increases the value for the user and raises operational efficiency.

The great variety of RFID systems enables an extremely large number of applications, which are growing faster with time and technological progress. Embedding RFID tags in literally everything that surrounds people, from underwear, through cars and trains, to pets and even in people, promises many benefits and new hitherto unimagined possibilities - easier and more efficient performance of all daily tasks. The benefits provided by RFID technology, especially security and unique identification, are increasingly being applied in postal processes as well.

1. INTELLIGENT SHIPMENT

1.1. Development of intelligent postal items

Given the changes expected in the development of technology and globalization of the market, significant changes are expected in the field of postal services, which are related to the new requirements of postal users, deregulation of the postal market resulting in greater efficiency and effectiveness of postal services.

Postal officials need to adapt to an environment in which the role of information is not limited to reporting on past events. The development of the postal service goes in the direction of making the information available to postal officials so that it allows them direct insight into the movement of the shipment.

It is necessary to develop an intelligent shipment system that will ensure that the collected information on shipments that are hierarchically organized in the postal system is made available to postal employees who will make business decisions based on such information and customer requirements and

thus change the existing business environment. service was not available online information about his shipment.

The goal of the intelligent shipment system is to enable the user of postal services the visibility of his shipment all the way from the point of departure to the destination, which means the application of intelligent postal bar code and the necessary infrastructure to expand the visibility of items in the postal network. Existing flows of items in postal traffic will be monitored by data flows on these items that will be available to users of postal services and postal employees.

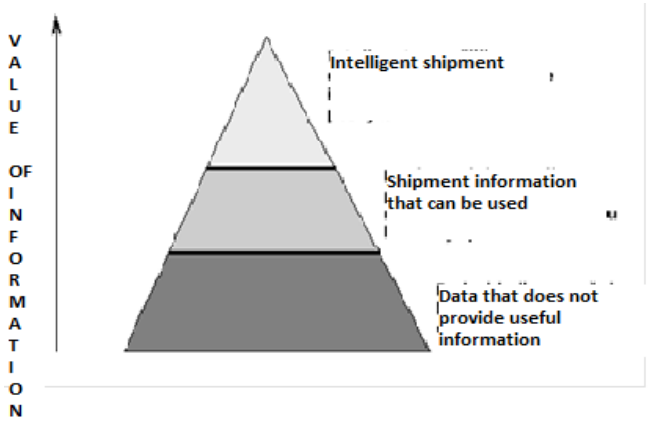
Improving the postal service by using shipment information and providing that information to postal service users increases the value of the postal service and raises the efficiency of the postal system as a whole.

1.2. Importance of shipment information in postal traffic

The postal service has a large amount of data. However, data that is not processed is in itself rarely useful and rarely provides information that can be used in decision making. Only after understanding the data and connecting it with the units of measurement related to making business decisions, the data becomes useful information. At that point, the data is converted into information and becomes valuable to the service provider and their user. If the information is not available in a timely manner, its value is significantly reduced and has only historical significance that can be used in creating various reports analyzing the activities carried out in the system.

Existing postal services already provide certain information to their employees and service users by requesting confirmation of delivery and confirmation of receipt of information. However, postal service users request pre-delivery information that is also needed by postal employees who deliver or deliver a shipment. Service users and post office employees require that their data and information be presented in an understandable way so that they can make real-time decisions that will eliminate potential negative effects. Competing companies already use shipment information that is at the fingertips of their employees and users of their services.

The term "intelligent consignment system" refers to the collection and transmission of information about each consignment in real time for a postal worker and a user of postal services that may positively affect the conduct of their operations. Customers use this information in different ways depending on which link is in their supply chain. Shipment owners can objectively evaluate their suppliers and mail as a service provider based on shipment movement information. This data can be used to identify supply chain disruptions and help eliminate them. Data on each piece of shipment allows to determine the time of delivery or possibly the reason for returning the shipment to the sender.



Mail service providers find value in the information received from the intelligent delivery system. By detailed measurement of the quality of services, the way of preparing mail for sending can be controlled with the aim of improving the quality of the service provided.

Figure 1. Value of shipment information

1.3. Intelligent shipments in a modern technological environment

The improvement of postal services is achieved through automation and mechanization of postal items processing, intelligent coding of items and shipment grouping processes. The structure of the code consists of a large amount of information that is machine readable and the codes are read automatically manually as part of the technological process of transmission of shipments ensuring the protection of the privacy of postal items. Through the intelligent bar code of postal items, the number of non-compliant codes on the pieces of items and the actual contents of the items is reduced to a minimum, which corresponds to good business practice and customer requirements. It is necessary to investigate the costs of creating and reading intelligent code within the postal system and by users of postal services. Data collection and IT infrastructure for collecting, transmitting and storing information is automated and integrated with developed software that allows tracking information from departure to destination with the ability to access this information by postal officials and users of postal services.

Although the full realization of intelligent postal items and the realization of the benefits expected from their application may take years, significant progress has been made in postal traffic towards the unique identification of items and their grouping and increasing the quality of addressing items. In the coming period, the postal service will focus on using the benefits of intelligent shipments that will improve the performance of the postal system, create new products in postal traffic and streamline business, which users of postal services will recognize as a new value of services provided.

Smart Mail offers the ability to upgrade existing services by allowing the sender to use my Smart Mail features (a postage stamp that can be sent without subsequent postage stamping). Existing postal products will be more competitive by using cost-reducing information to increase their performance while increasing the efficiency of postal traffic and thus reducing the operating costs of postal service users.

2. RFID TECHNOLOGY

2.1. Fundamentals of RFID systems

In a broader sense, RFID (Radio Frequency Identification) systems are all systems that use frequency radio waves to collect information to identify and track objects or persons. In a narrower sense, an RFID system means a system consisting of an RFID reader, an antenna, a data processing system and an RFID transponder - a tag that is a carrier of information for identifying and tracking an object. RFID technology allows the system to function without direct optical visibility and in any weather conditions, as well as the simultaneous reading of multiple tags.

Radio frequency identification - RFID is a system for remote sending and receiving data using RFID cards / transmitters. An RFID card is a rather small object that can be glued or installed in the desired product and device. RFID cards contain an antenna that allows them to receive and send radio waves from RFID transceivers. It can be said that the forerunner of RFID technology is a type of bug (created in 1945) that sent signals via radio waves. The inventor is the Russian scientist Leon Termin. A similar technology was used by the British in World War II, IFF (Identification friend or foe) developed in 1939.

Application, as well as application in tracking applications, RFID appeared in the eighties and quickly gained a lot of attention due to its ability to track moving objects. As a sophisticated technology, with unimagined possibilities of application, it is constantly evolving and the range of possible uses of this technology is constantly expanding. It is assumed that the first research work published was the work of Harry Stockman, who published the work in 1948 under the title "Communication as a reflection of power" and it took almost 40 years for RFID cards to come to life in practice.

The problem that is being addressed today by introducing new technology is - how to track a unique product from its inception to the end consumer. The standard bar code identifies only the manufacturer and the product, but not the unique item. The bar code on the cover of one product from the palette is the same on each cover of each product from that palette, so it is impossible to single out a specific product via the bar code itself. The RFID transponder, on the other hand, carries an identifier - a serial number unique only to that specific product.

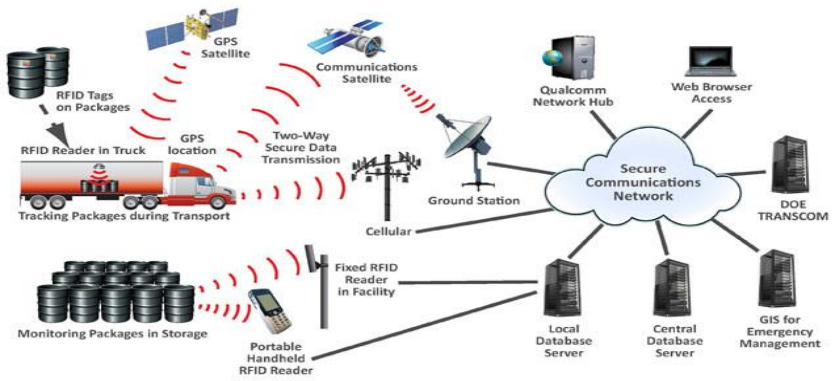


Figure 2. The positioning system of the transport means and shipment [2]

[2] Source: https://www.automatika.rs/baza-znanja/obrada-signala/uvod-u-rfid-tehnologiju.html

There are many ways to track and identify objects, animals and people. From the first traders, the quantity of goods is counted and shipments are tracked. Written labels and various symbols have been useful for identifying several products or people, but to identify hundreds of packages per hour, some form of automation is still needed. The bar code is probably the most well-known computer-readable way of marking, but the light used shows some drawbacks. Most importantly, it requires a direct line of sight, so the object must be facing the right side and nothing must be found in the path between the laser and the bar code. Other forms of identification, such as, for example, magnetic stripe on credit cards, must be placed correctly towards the card reader or even inserted into the reader in an appropriate manner. Radio Frequency Identification (RFID) is a technology that has seen great growth in recent years, although its basics have been around for decades. Like any serious technology, it had to go through a period of transition from a highly professional and "elite" field to affordable, everyday use.

Figure 3. Working principle of RFID "tag"

The main advantages of RFID technology are:

- A direct line is not necessary - the reader does not require a direct line of sight with the object. This reduces the processing time of the product, which would be spent on turning the object to the right side.
- High speed item enumeration - a large number of items can be scanned almost simultaneously. As a consequence, the time required to count items is reduced.
- Different forms of parts - RFID tags are produced in different sizes and shapes, and this allows this technology to be used in different situations and in different environments.
- Tracking of individual items - The ninety-six RFID tag allows tracking of billions of different items.
- Possibility of rewriting - some types of tags can be written more than once. In case of reuse of the container, this is a great advantage. Also, tags that are written only once are available.

2.2. Application of RFID system in postal traffic

RFID technology has experienced strong growth and attracted worldwide attention from the moment when the price of RFID tags began to fall continuously and when some of the leading retail chains and the

US Department of Defense ordered their suppliers to strictly use this identification technology. By reducing the price, RFID has expanded from the area of personal identification to the level of identification of individual products. As a result, the field of application has rapidly expanded to supply chain logistics, postal and courier services as well as the supervision of high-value facilities.

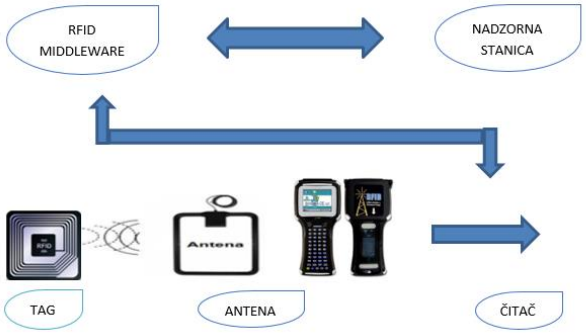


Figure4. Application of RFID system

A very important fact for the postal business is that "RFID industries are counting on more intensive use of RFID technology by post offices and courier services. It is estimated that by 2016, the share of postal and courier services in the RFID equipment and transponder market will be around $ 3 billion, 25% in the US, 25% in Europe and even 50% in East Asia. It is estimated that 650 billion shipments a year will then be identified using RFID tags. "

2.2.1. Control of the collection of postal items from mailboxes

By applying the RFID system, it is possible to automate the process of tracking the collection of shipments from mailboxes. The principle of operation is to mount a tag with a uniquely entered ID code on each mailbox. The collection bags have a mounted RFID micro reader with enough memory to write and store the read ID codes from the tags on the cases. At the place where the collected mail is selected, the contents of the micro reader are read. In this way, the ID of each mailbox that is visited in the process of collecting shipments is automatically recorded.

2.2.2. Vehicle tracking and mail warehousing processes

This system also offers the possibility of tracking postal vehicles. In the event that postal vehicles move between predefined and fixed destinations and destinations, it is possible to automate the tracking of the movement of postal vehicles even without human influence. In this case, the tag is fixed directly to the postal vehicle. At the time of arrival and departure from the destination, the reader enters information about the time of arrival and time of departure in the tag at a given point. When the vehicle returns to the destination

point, this data is automatically downloaded during the passage of the vehicle through the entrance of the object (via the antenna and the reader).

Tracking of postal vehicles is related to the management of processes within the postal warehouse. Namely, postal vehicles do not have to be strictly monitored with a fixed tag, but the tag can be placed on some storage element (package, pallet, container, etc.). Each package, pallet, container, or other fixed-tag storage element makes it easy to organize, store, search, and target users.

The reader is located at the entrance / exit of the warehouse, and at strategic points within the warehouse. Strategic points inside the warehouse can be accesses to the transfer point, parking lot, refueling point, etc. In the case of parking control, the RFID tag is placed on the vehicle or located at the driver, and the reader is located at the entrance to the parking space. Upon arrival of the vehicle, the information located in the transponder is read, processed and an appropriate command is given.

Warehouse process management also includes the identification of staff employed in the warehouse. Access control and identification of personnel with RFID technology allow control to be performed in a non-contact manner (without passing through the magnetic head, presenting it to the reader or typing the code code on the lock code code keypad) - it is enough for staff to carry an RFID tag. These types of tags are very diverse. They can be in the form of key fobs all the way to tags embedded in employees 'watches. In addition to the identification of staff in the warehouse of courier organizations, this system of identification of people is applied in other facilities of the organization such as post offices, centers, alternating post offices, customs offices and the like. RFID systems are widely used in transport chains to identify containers, pallets, transport units and employees. Applying this technology increases efficiency, reduces errors (due to the elimination of paperwork), and increases the quality of management and planning.

2.2.3. Tracking of shipments in the postal traffic system

The shipment tracking system became more widely used in 1996 with the aim of improving the calculation of terminal costs in international postal traffic. The task of this system was to determine as precisely as possible at what point the postal operator of the country of destination assumes responsibility for the incoming shipment. A prerequisite for the functioning of this system is that the test shipment does not differ in any way from the others and that the process of processing shipments during testing is identical to that when there is no testing. The primary goal of the individual shipment tracking system is to automatically test the quality of postal services. The system primarily refers to international postal traffic and letter-post items with a weight of 20 grams, although its possibilities are far greater. The basic elements of this letter tracking system are: tags, tracking portal (antenna and reader), local data collection system and central tracking system.

In addition to tracking individual letter items, the system is also used for tracking-transferring postal packages or money. Money transfer and insurance of deposit transactions can be raised to a higher level by applying the RFID system. Each money bag contains a fixed tag that is read on the deposit machine. When the ID code from the tag is authorized, the space for storing money is unlocked. The client inserts a bag of money into the opening and reads the ID code again. If the ID code is correct, a receipt is printed and issued to the client.

2.3. Advantages of RFID systems over barcoding

This way of identification, unlike the previous bar coding, directly and indirectly affects the rationalization of the entire postal transport. In addition to the fact that individual shipments are monitored within the installed RFID network, there are huge advantages in the processing of shipments in the sorting center. The main advantages are:

- no optical visibility required,
- reading and writing data is done without any contact with the object,
- monitoring the entire production process over time,
- monitoring information in the control process,
- the shape of the transponder can be varied, adapted to both shipments and applications,
- the transponder is resistant to light reflection and is not disturbed by complete darkness,
- the transponder has a very long service life, reusing the same transponder reduces costs,
- the transponder can enable reading and / or writing of information
- speed up the processing of postal items within the processing center,
- optimize the distribution of workers within the transmission chain,
- optimize secondary resources,
- eliminate errors caused by human action,
- provide IT support for management decisions,
- provide systematic statistical records important for the planning of postal traffic,
- increase the speed of shipment or minimize the time of shipment,
- increase the quality of customer service, etc.

CONCLUSION

Operators, users and other participants in the postal market often have different perceptions when it comes to the quality of services. In order to ensure customer satisfaction, it is necessary to ensure efficient business processes, but also a satisfactory level of service from a technical aspect. For this reason, the parameters that need to be provided in order to meet user requirements are listed. The performance of the system should enable the fulfillment of the set goals in terms of certain characteristics of postal traffic. Starting from the fact that the technology of the work process in the post office is the same as the provision of services, the importance of introducing new ITS technologies for formulating strategies is very important. Without innovative technology, there are no conditions for gaining a competitive advantage, and new technologies must be viewed as part of a business competitive strategy based on time and knowledge.

The development of RFID technology results in cheaper production of equipment (transponders, readers), increasing memory, wider signal transmission range and faster processing. However, it is unlikely that RFID will soon completely replace bar code-based technology. It can be assumed that its use will grow where other methods of automatic identification are not effective. As we have seen, the standardization that has enabled the growth and global use of bar codes is necessary in RFID systems as well. In most environments, RFID achieves 99.5% to 100% readings in the first scan. Without moving parts or optical components, maintenance is far simpler. It is necessary to modernize the postal system, increase the level of application of information and communication systems, as well as raise the level of quality of service provision and reorganize certain processes, following the example of postal systems in other European countries.

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SOU “Gošo Vikentiev”

Средно Општинско Училиште
Гошо Викентиев

BEZBEDNOST VO SOOBRAKAJOT

NOVI BEZBEDNOSNI TEHNOLOGII

Izrabotil:

Zlatko Petrušov
Dip. Soob. Ing

Apstrakt

So nagliot razvoj na elektronikata, denes e promenet načinot na upravuvanje so vozilata. So primeneta na ovie sistemi na vozilata se ovozmožuva podobruvanje na bezbednosta vo soobrakajot. Zablagodaruvajki se na naprednite tehniki, od koi poveќeto se vo faza na eksperimentalna primena, možeme da očekuvame namaluvanje na brojot na soobraќajni nezgodi. Prednostite na ovie sistemi doagaat do izraz vo ekstremni uslovi na vozenje, kako na pr. zamrznat kolovoz, koga i vgradeniot ABS sistem ne uspeva da go zadrži pravecot na dviženje na voziloto. Novite sistemi so pomoš na instalirani senzori i algoritmi za kontrola nepogrešlivo uspevaat da go stabiliziraat voziloto. Vo seminraskata rabota se obraboteni novite tehnologii koi sto pridonesuvaat za zgolemuvanje na pasivnata i aktivnata bezebednost vo soobrakajot, navedeni se nekolku primeri na nekoi proizvoditeli na motorni vozila kako tie gi imaat inkorporirano bezbednosnite tehnologii kaj svoite vozila, na koj način tie funkcioniraat i koi se nivnite pozitivni i negativni strani.

1.Voved

So nagliot razvoj na elektronikata deneska promenet e načinot na upravuvanje na patničkite vozila, a zatoa što ke ponudi idninata možeme samo da pogoduvame. Postojat različni mislenja vo vrska so toa kako bi trebalo da se razviva transportot vo idnina. Što se odnesuva na transportot na patnici, vidliv e trendot na zgolemuvanje na mestata za sedenje kaj patničkite avtomobili, kako bi se namalil soobrakajniot metež na patistata, a so toa bi se zgolemila i bezbednosta vo soobrakajot.

Isto taka se vovedeni sistemi za održuvanje na rastojanieto megu vozilata koi koristat posebni radarski i senzorski sitemi. Osven efikasnosta vo transportot, takvite rešenija znacajno ke go namalat i brojot na nezgodi na patištata. Vo seminraskata rabota se obraboteni novite tehnologii koj sto pridonesuvaat za zgolemuvanje na pasivnata i aktivnata bezebednost vo soobrakajot, navedeni se nekolku primeri na najnovite vozila nekoi proizvoditeli na motorni vozila, kako tie gi imaat inkorporirano bezbednosnite tehnologii kaj svoite vozila na koj način tie funkcioniraat koi se nivnite pozitivni i negativni strani kako i napredni resenija vo vrska so stabilnosta, sopiranjeto, vidlivosta, održuvanjeto na bezbedno rastojanie isto taka i održuvanje na patnata brzina, održuvanjeto na koncentracijata na vozačot i drugi napredni rešenija koi imaat dosta golem udel vo gradenjeto na bezbeden transport na patištata.

2.Najnovite vozila I nivnite bezbednosni tehnologii

Mnogu avtomobilski giganti se zalagaat da postavat vodečki standardi vo bezbednosta, megusebno se natprevaruvaat vo voveduvanjeto na brojni inovacii za podobruvanje na bezbednosta. Eve nekoi od tie inovacii:

Bezbednosniot sistem vo najnovite vozila koristat najmoderna senzorska tehnologija za da osigura deka patnicite ja imaat potrebnata zastita, koga ke im zatreba. Samo pet milisekundi e sè sto na sistemot mu treba za da zabeleži udar, da ja presmeta negovata silina, da prepoznae koe od osumte vozdusni pernicinja treba da se aktivira i da gi naduva do korektno nivo. (Sl. 1). Vo isto vreme, sistemot za zadržuvanje na patnicite i aktivnite potpirači za glava (ako se vgradeni komfornite sedista, po izbor) se aktiviraat spored potrebata

(Sl. 1).

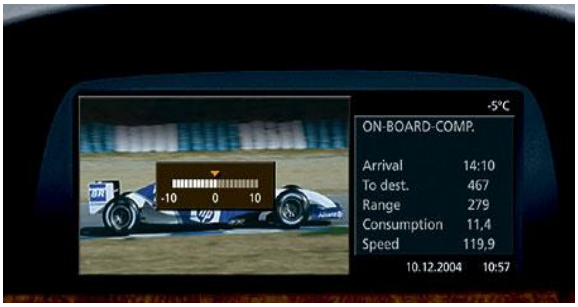
2.1 Sitem za noќno gledanje

Najnovite vozila imaat vgradeno prilagodlivi predni svetala, po izbor, im dava novo svetlo na svioklivite patišta. Night Vision system (sistem za noќno gledanje) odnosno infracrveni senzori koj postojano ja nadlgeduvaat patekata vo nokni uslovi kako i brzinata na avtomobilot, skršnuvanjeto i upravuvačkiot agol na prednite trkala; togaš sistemot može da ja presmeta patekata na kolovozot pred nego. Elektromotorite gi vrtat prednite svetla za da go nasočat snopot tocno onamu kade sto avtomobilot se upatil. Rezultatot e: mnogu podobreno osvetluvanje i zgolemena bezbednost, osobeno na svioklivi patišta.

(Sl. 2).

2.2 Sistem za zgolemuvanje na vidlivosta

Prednata kamera e postavena vo centarot na predniot odbojnik i koristi specijalni prizmatični leќi, postaveni pod 90 stepeni, za da obezbedi jasen pregled na soobraќajot otstrana na raskrsnicite. Ova e prikazano na on-board monitorot (Sl. 3). Zadnata kamera, postavena na kapakot na bagažniot prostor, se aktivira koga se vklučuva stepen na prenos za ôd nanazad. Taa ja prikazuva oblasta zad avtomobilot (do 131 stepen) i obezbeduva jasen pregled pri ôd nanazad.



(Sl. 3).

2.3 IDrive (kontroler na centralnata konzola)

Maksimalna upotreblivost, minimalna složenost: iDrive (kontroler na centralanata konzola) gi poednostavuva kontrolite na mnogu vozački osobini i karakteristiki na udobnost na kabinite na najnovite vozila. Cesto koristenite karakteristiki – brišači na vetrobranskoto staklo, indikatori, radio i telefon na primer – se kontrolirani preku račkite ili kopčinjata na ili okolu upravuvačot. Pristapot do sekundarnite funkcii kako sto se adresarot, sistemot za navigacija e preku iDrive (kontrolerot na centralnata konzola), so menija i informacii koišto se jasno prikažani na kontrolniot displej.

2.4 Sistem za aktivna kontrola na patnata brzina

Idealen za relaksirano vozenje na golemi rastojanija: Aktivnata kontrola na patnata brzina (ASS) mu ovozmožuva na vozačot da gi odbere posakuvanata brzina na dviženje i rastojanieto koešto treba da se održuva od voziloto pred nego. Senzorite postojano go nadgleduvaat patot pred niv: sè dodeka patot e čist, se odrzuva patnata brzina. Ako se zabelezi vozilo, sistemot ja namaluva brzinata na avtomobilot za da osigura deka taa ke ostane na predodredenoto rastojanie. Otkako patot povtorno e čist, ASS se vraka na patnata brzina.

2.5 Bezbedna pozicija na sedenje

Izbornite komforni sedišta za vozačot, sovozačot i vo zadniot del na kabinata se ergonomski dizajnirani i električno prilagodlivi so cel da se zgolemi bezbednosta. Ventilacijata na sedistata garantira deka duri i pri najdolgite patuvanja možete da uživate vo udobnosta. Osobinata za aktivno sedenje vo sedištata za vozačot i sovozačot ja podobruva cirkulacijata i gi relaksira muskulite pri dolgite patuvanja so nežno podignuvanje i spustanje na površinite za sedenje vo pravilni intervali.

3.Zgolemuvanje na bezbednosta kaj avtomobilite

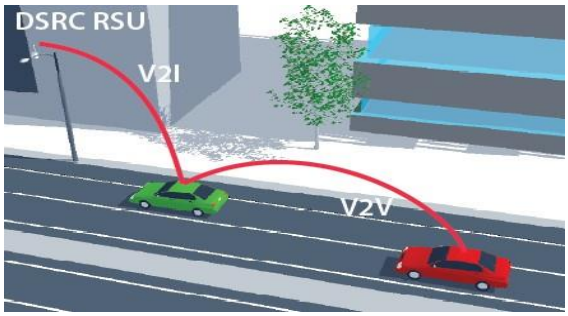
Eden od načinite za sprečuvanje na soorakajnite nezgodi, koj ke se srekava vo idnina, e proizvodstvoto na avtomobili koi mozat da predvidat nezgoda, kako i da prezemat akcija vo vrska so sprečuvanje na istata. Odgovor na ova prasanje dava sistemot V2V - komunikacija pomegu vozilata.

Laboratorijata za istrazuvanje na elektronika na eden golem avtomobilski gigant pusti vo upotreba dva avtomobili so vgradena tehnologija V2V za uspešno upravuvanje na avtomobilite niz San Francisko. Sekako prenosot na prviot podatok do praviot avtomobil, vo tocno opredeleno vreme bara dosta složen algoritam. Zasega eksperimentot dava dobri rezultai koga e vo prašanje pomal broj na avtomobili, teškotiite nastanuvaat vo golemi soobrakajni tokovi.

Nekoj od najnovite avtomobili se opremeni so DSRC. Pojačaniot sistem za kontrola na stabilnosta predviduva koga ke se upati signal od avtomobil so vgraden DSRC sistem koj e zastanat pokraj patot avtomatski signalot da se prenese preku matičniot kompjuter do sopiračkite, pri sto avomobilot započnuva da sopira bez intervencija na vozačot.

Golemite avtomobilski giganti razvivaat sistemi haptic feedback (pedali i vozački stakla koi vibriraat), t. n. sistemi koi se odnesuvaat kako vozač od zadnoto sedište, megutoa so razlika deka ovoj vozač e sekogaš vo pravo.

Vozačite naskoro ќe gi zamenat istrošenite pnevmatici so meki gumi so golemi performansi, pred sè vrz osnova na koristenje na elektroaktivni polimeri. Toa se takvi komponenti koi imaat možnosti slični kako kaj coveckite muskuli, da go menuvaat oblikot koga ke dojde do promena na elektricitetot.



4.Zaključok

Razvojot na elektonikata i sè pomasovnata primena na elektronskite sistemi kaj vozilata, ke ovozmožat posigurno i pobezbedno upravuvanje so motornite vozila, kako i namaluvanje na brojot na soobrakajni nezgodi. Blagodarejќi na naprednite rešenija avtomobilite ke ja trošat energijata mnogu poracionalno.

Idnite rešenija vo vrska so kontrolnata tabla ke bidat mnogu pomoderni i ke pretstavuvaat komanden centar preku koj vozačot ke upravuva so site parametri na voziloto i istovremeno ke kumunicira so site drugi učesnici vo transportot.

Novite sistemi, ne samo sto nudat golema bezbednost i komfor, tie otvoraat mnogu novi možnosti vo proizvodstvoto i dizajnot. Dizajnerite poveke ne moraat da mu robuvaat na klasičniot raspored na upravuvačkite mehanizmi i prekinuvači okolu koi se gradi sè ostanato.

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HIGH MUNICIPAL SCHOOL

“Gošo Vikentiev”

TOPIC : SECURITY IN TRAFFIC

NEW SAFETY TECHNOLOGIES

Prepared by:

Zlatko Petrušov

Graduate Traffic Engineer

Abstract

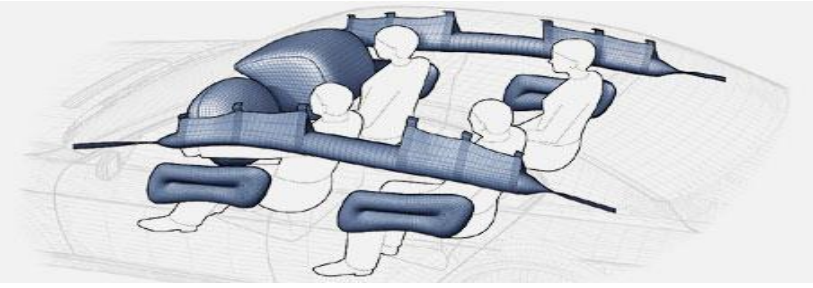
The sudden development of electronics, today has changed the way of management vehicles. The appliance of these systems on vehicles allows improvement of the traffic safety. Thanks to the advanced techniques, most of which are under experimental application, we are eligible to expect reducing the number of traffic accidents. The advantages of these systems come to the fore in extreme driving conditions, eg .frozen road, when built ABS system fails to retention direction of the vehicle. The new systems helped by installment of sensors and control algorithms unmistakably fail to stabilize the vehicle. This seminar work processed the new technologies that contribute hundred of increasing passive and active traffic safety listed several examples of some manufacturers of motor vehicles as they have incorporated security technologies in their vehicles, the way they operate and what are their positive and negative sides.

1. Introduction

The sudden development of electronics today changed the way of the management of passenger vehicles, and what the future will offer we can only guess. There are different opinions about how we should develop transport in the future. As for the transportation of passengers, visible trend of increasing seating positions in passenger cars, could reduce traffic congestion on the roads, and it would increase and traffic safety. Also, systems which maintain distance between vehicles using special radar and sensor have been introduced. Besides efficiency in transport, such solutions will significantly reduce the number of accidents on the roads. The seminar paper processes the new technologies that contribute hundred of increasing passive and active safety in traffic, listed several examples of the latest vehicles certain manufacturers of motor vehicles, as they have incorporated security technologies in their vehicles that way they operate are their positive and negative sides as well as advanced solutions on the stability, braking, visibility, maintaining a safe distance also maintain road speed maintenance, the concentration of the driver and other advanced solutions that have a sizable stake in building a secure transport roads

2.And their latest vehicle safety technologies

Many automotive giants strive to set standards leading security, mutual compete in introduction of numerous innovations to improve safety. Here are some of those innovations: Security system in the latest vehicles use modern sensor technology to ensure that passengers have the necessary protection when they need it. Only five hundred milliseconds is what the system needs to note blow and to calculate its power to identify which of eight airbag pillows should be activated to inflate the correct level. (Fig.1). At the same time, system retention passenger and active head restraints (if fitted luxurious seats choice) are activated as needed.

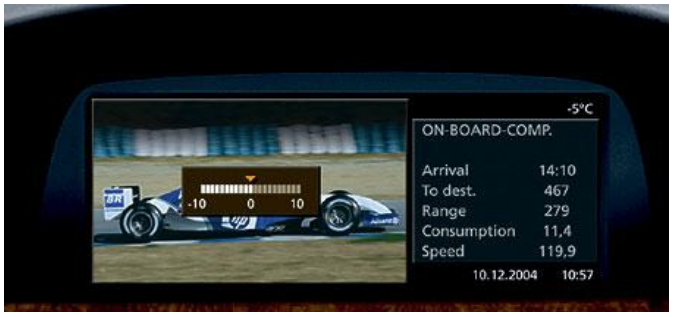


2.1 All night vision

The latest vehicles have built adjustable front lights, optionally, gives new light on cornered (waved) road. Night Vision system (system for night vision) or infrared sensors that constantly monitor the track in night conditions and speed of the car, and deflecting the steering corner of the front wheels; then system are eligible to calculate the path of the road before him. Electric motor turns head lights to beam directed exactly where the car Is directed. The result: much improved lighting and increased security, especially corner roads. (Fig.2).

2.2 System for increased visibility

The front camera is placed in the center of the front bumper and uses special prismatic lenses set at 90 degrees to provide a clear overview of the traffic side of intersections. This is a story of on-board monitor (Fig. 3). The rear camera mounted on the cover of boot space, are activated when includes gear to walkbackwards.It shows the area behind the car (to 131 degree) and provides a clear view at the back.



2.3 I Drive (controller on the center console)

Maximum usability, minimum complexity: I drive (Central console controller) simplifies driving controls with many properties and features the comfort of the cabins on the latest vehicles.

Often used features – wipers on the windscreen, indicators, radio and telephone for example - are controlled by handles or buttons on or around steering.

Access to secondary functions as WTO address, the navigation system is through I drive (controller on the center console), with menu and information which are clearly shown at the control display.

2.4 System for active control of road speed

Ideal for relaxed driving on long distances: The active control of travel speed (ACC) enables the driver to select desired speed and distance movement which they should maintain the vehicle in front. The sensors continuously monitor the road ahead of them: until the road is clear the road speed is maintained. If a vehicle is noticed, the system reduces the speed of the car to ensure it will remain before the specified distance. Once again the road is a clear, ACC returns to road speed.

2.5 Safe seating position

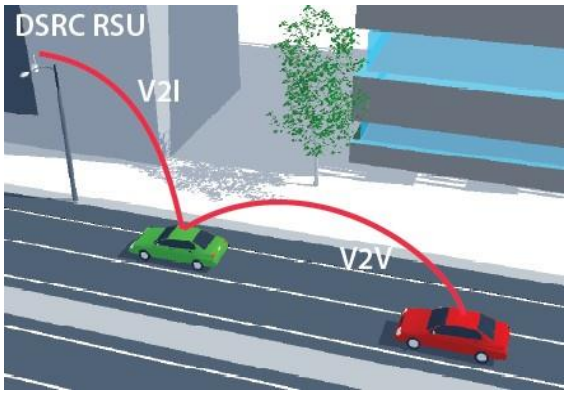
Election comfortable seats for the driver, fellow traveler in the back of the cab is ergonomically designed and adjustable electrically adjustable security. Ventilation seats guarantee that even the longest trips are eligible to enjoy in comfort. Properties of active sitting in seats for driver, fellow traveler

and improves circulation and relaxes muscles in long trips with gently lifting up and down of superficial seating in regular intervals.

3. Incensement of the safety in cars

One of the methods for preventing traffic accidents, which will meet in the future, is producing cars that people could foresee an accident, and to take action in preventing the same. The reply to this question is given by the system V2V - Communication between vehicles.
The research electronics laboratory of a large automotive giant brought in use two cars built for V2V technology management successes car through San Francisco. Certainly, the first data transmission to the right car, corrects some time looking pretty complex algorithm. So far the experiment gives good results when fewer cars are in question, resulting in severe major accidents flows.

One of the newest cars is equipped with DSRC. The strengthened control system provides stability when you are sent a signal from a car with a built-DSRC system roadside stand is automatically signal to be transmitted via computer to personal brakes, the car begins stopping without intervention of the driver. Major automobile giants develop systems haptic feedback (pedal and drivers glass which vibrate), known as slightly systems that act as driver from the back seat. However, the difference is that this driver forever is right.
Drivers soon will replace spent tires with soft tires with great performance, primarily based on using, electro active polymers. These are such components which have opportunities similar like human muscles to change shape when you come to change electricity.



4. Conclusion

The development of electronics and the expanded electronic systems in vehicles will afford more safer management of motor vehicles and reducing the number of traffic accidents. Thanks to the advanced solutions cars will waste energy much more rational.
Future solutions on the dashboard will be very modern and will represent the command center through which driver will manage all the parameters of the vehicle simultaneously with all other communicate participants in transport.

The new systems not only offer one hundred great security and comfort, they open many new possibilities in production and design. Designers no longer will have to be slaves of the classical schedule steering mechanisms and breakers around which everything else is built.

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ŠOLSKI CENTER CELJE
Srednja šola za kemijo, elektrotehniko in računalništvo

Eva Boh, profesorica angleščine

POVEZOVANJE Z GOSPODARSTVOM S POMOČJO UPORABE PEDAGOŠKEGA PRISTOPA STORYLINE PRI ANGLEŠČINI ZA LOGISTIČNE TEHNIKE

POVZETEK:

Prispevek obravnava uporabo mednarodno priznanega pristopa Storyline pri pouku angleščine za logistične tehnike.

V prispevku uvodoma opredelim status angleščine v poklicnem izobraževanju in njeno vlogo v kurikulu. Prispevek nadaljujem s problematiko medpredmetnega povezovanja poučevanja tujega jezika in strokovnih modulov in ponudim rešitve tako vključevanja strokovne terminologije v pouk angleščine kot tudi jezikovnega učenja.

Sledi opis pristopa Stoyline. Predstavim ga od začetne ideje in potrebe po takšnem didaktičnem pristopu do njegovih bistvenih značilnosti ter načel in ključnih elementov.

Prispevek zaključim s praktičnim primerom načrtovanja projekta s pomočjo pristopa Storyline za logistične tehnike. Predstavitev vključuje opise posameznih faz pristopa Storyline za logistične tehnike in možnosti sodelovanja z gospodarstvom za potrebe učnega procesa. Pri pouku angleščine dijaki za slovenska podjetja pripravijo prevode predstavitev novih logističnih trendov v tujini ali jim ponudijo pomoč pri komuniciranju s strankami in s partnerji iz tujine, sodelujejo pri prevajanju logistične dokumentacije in pravil poslovanja v različnih državah ali za logistična podjetja prevedejo predstavitve logističnih storitev naših podjetij.

KLJUČNE BESEDE: Storyline, strokovna angleščina, didaktični pristop, medpredmetno povezovanje

UVOD:

Pri sodobnem pouku tujih jezikov stremimo k medpredmetnemu povezovanju. Poučevanje tujega jezika na srednjih tehniških in strokovnih šolah temelji na dopolnjevanju s stroko, torej logistiko in prometom.

Skozi leta so se oblikovale različne doktrine o tem, kako vpeljati v pouk strokovno terminologijo, vse od zgolj prevajanja strokovnih terminov pa do različnih sodobnih didaktičnih pristopov. Eden takšnih sodobnih pristopov je tudi mednarodno uveljavljen pristop Storyline, oziroma zgodbanje, kot ga poimenujemo v slovenščini. Gre za poučevanje tujega jezika s pomočjo zgodbe, ki kot rdeča nit povezuje učno snov v smiselno celoto. Tak pristop je še posebej učinkovit, če ga povežemo z realnimi okoliščinami, kot je na primer povezovanje s situacijami iz bodočega delovnega okolja dijakov, zato raziskave potrjujejo, da je posebej primeren za poučevanje strokovne terminologije v poklicnem izobraževanju.

ANGLEŠČINA KOT JEZIK STROKE:

Zavod RS za šolstvo je v učnem načrtu za srednjo šolo (Zavod RS za šolstvo, 2018, p. 1) predmet angleščine prepoznal kot ključen dejavnik v procesu svetovne globalizacije, še posebno od vključitvi Slovenije v Evropsko unijo, saj nam znanje tujega jezika omogoča boljši dostop do informacij, intenzivnejšo medsebojno sodelovanje na kulturnem in gospodarskem področju, globlje medsebojno razumevanje in spoštovanje drugačnosti. Učni načrt predlaga sodobne pristope, informacijsko in komunikacijsko tehnologijo in podajanje uporabne in življenjske učne vsebine ter medkulturno ozaveščanje.

Pri predmetu angleščine v srednješolskem poklicnem in strokovnem izobraževanju je velik poudarek na angleščini kot jeziku stroke oziroma strokovni angleščini (angl. English for specific purposes – ESP). Strokovno angleščino lahko torej opredelimo kot poučevanje in učenje specifičnih spretnosti in jezika, potrebnega za določeno skupino učencev in za določen namen (Krzanowski, 2010, p. 4).

Ker pa nikoli v celoti ne moremo predvideti, v kakšnih tujejezikovnih situacijah se bodo dijaki znašli pri opravljanju svojega poklica, je zelo pomembno, da dijakov ne naučimo zgolj določenega nabora strokovne terminologije in izbranih poglavij slovnice, pač pa jih usposobimo za veščine, kot so kreativno razmišljanje, postavljanje ključnih vprašanj, hipotez in lastno raziskovanje problemskih nalog. Samo tako jih bomo opremili z znanji, ki so potrebna, da se bodo znašli v novih situacijah, znali poiskati prave vire informacij, jih ustrezno kritično ovrednotiti in uporabiti.

OPIS PRISTOPKA STORYLINE:

Poučevanje tujega jezika ne bi smelo biti togo zasnovano in vnaprej določeno, ampak bi moralo temeljiti le na naboru preverjenih in znanstveno potrjenih fleksibilnih pedagoških priporočil, postopkov in načel (Ur, 2013, p. 468). Takšen pristop k poučevanju tujih jezikov omogoča pristop zgodbanja.

Creswell (1997, pp. 7–8) opredeljuje ključne elemente pristopa zgodbanja kot:

- Začetno postavljanje ključnih vprašanj, s katerimi ovrednotimo predznanje učencev in prepoznamo vrzeli v znanju;
- Členitev zgodbe v poglavja tako, da z njimi lahko pokrijemo celotno snov;
- Friz ali predstavitveni prostor, ki je končni akcijski cilj, ki omogoča predstavitev ugotovitev in doprinosa učencev širši javnosti;
- Vsak učenec ima svojo vlogo, ki jo sam izoblikuje in ponotranji;
- Med zgodbanjem lahko pride do nepredvidenih in nenačrtovanih situacij, ki jih je potrebno razrešiti in takšne situacije učence spodbujajo h kreativnemu odzivanju in reševanju problemov, to pa je lahko tudi osnova za razširitev in nadgradnjo znanja;
- Zgodbanje se zaključi s predstavitvenim dogodkom, ki omogoča refleksijo naučenega, pregled učnih dosežkov in oceno doseganja učnih ciljev.

Zgodba je glavni vodnik naših misli (Langer, 1967, p. 261), ki nam omogoča naraven način mišljenja in osmišljanja naših izkušenj ter sveta okrog nas (Cremin & Flewitt, 2017). Zato želimo, da tudi poučevanje tujega jezika temelji na tem, kar pa v razredu pri klasičnem poučevanju težko izvedemo. Vpeljava zgodb v pouk nam lahko pomaga kontekstualizirati tujejezični pouk in ga povezati z izkušnjami iz realnega sveta (Kirkgöz, 2012, p. 110). S tem tudi vpeljemo učinkovit model uporabe tujega jezika za učence (Ur, 1999, p. 89) in jezik v rabi (Winch, 2002, p. 365). Učinkovitost rabe zgodb pri pouku tujega jezika ugotavljata tudi Ellis in Brewster (2014, pp. 6–7). Avtorici izpostavljata predvsem motivacijsko vlogo zgodb in učinke na domišljijo učencev, saj je zgodbanje zabavno, poučno, privlačno, vse učence angažira in jih naredi aktivne soustvarjalce zgodbe.

Utemeljitelj pristopa zgodbanja Bell (Bell, 2008, p. 63) zagovarja trditev , da bi se morala kakovost učitelja meriti prav s tem, kako dobro se znajo njegovi učenci učiti sami. Pristop zgodbanja temelji na tem, da učenci najprej ocenijo in ovrednotijo svoje predznanje, si sami postavljajo ključna vprašanja, oblikujejo ideje za rešitve, iščejo potrditve idej, jih prilagajajo glede na pričakovane rezultate in na koncu sami ovrednotijo, kar so naredili. V času, ko nam internet omogoča hiter dostop do vseh informacij, se učni načrti vse bolj odmikajo od poučevanja, ki temelji na informacijah in dejstvih, in vedno bolj temeljijo na poučevanju zmožnosti, veščin in spretnosti, kako poiskati informacije, jih kritično ovrednotiti in uporabiti, se soočiti s problemi, kreativno iskati rešitve, oblikovati svoje ideje, torej se naučiti, kako se učiti, ugotavlja Bell (Bell, 2008, p. 61). Ta avtor vidi možnosti v uporabi zgodbe, tako, da jo umestimo v čas in prostor, na njen potek pa s ključnimi vprašanji vplivajo učenci sami in pri tem raziskovalno iščejo kreativne rešitve problemsko zastavljenih nalog (Bell & Harkness, 2016a, p. 18).

Pristop zgodbanja je torej raziskovalni pristop v vseh fazah procesa zgodbe, tako pri začetnem oblikovanju ključnih vprašanj in izhodiščnega položaja, pri opredelitvi problema, oblikovanju ideje njegove rešitve,

testiranju predlagane rešitve, njenem evalviranju in oblikovanju končne rešitve problema (Järvinen, 2007, p. 53).

Bistvena razlika med pristopom zgodbanja in drugimi didaktičnimi pristopi je v tem, da učencem pripravi iniciativno in kreativno učno okolje s tem, ko učence vpelje v aktivno delo s pomočjo realnih učnih situacij in tem, spodbuja sodelovalno učenje, vključuje »mehka« znanja (angleško *soft skills*), razvija jezikovne kompetence, pa tudi izboljšuje pisne zmožnosti, matematične, IKT in raziskovalne veščine ter sposobnosti vrednotenja, predstavitve in utemeljevanja svojih ugotovitev in rezultatov (Wrigley, 2007, p. 171).

Pristop zgodbanja se od drugih sodobnih didaktičnih pristopov poučevanja angleščine, ki prav tako v ospredje postavljajo učenca in njegovo aktivnost ter projektno delovanje, loči tudi po tem, da v zgodbo vključi čustveno obarvanost in moralne vrednote (Mitchell, 2016, p. 32) ter zagotavlja oseben pristop pri poučevanju (Bell & Harkness, 2016b, pp. 21–22).

Uporaba pristopa zgodbanja je vedno pogosteje vključena v pouk tujih jezikov, saj se je izkazala za učinkovit pripomoček, kar je podprto tudi z znanstvenimi raziskavami in predstavitvami na mnogih mednarodnih konferencah ter v številnih uglednih revijah in drugih publikacijah.

NAČRTOVANJE POUKA S PRISTOPOM STORYLINE:

Creswell (1997, p. 13) omenja štiri temeljna področja pri načrtovanju in izvajanju zgodbanja:

- pripravo urnika,
- načrtovanje poteka zgodbe,
- oblikovanje skupin in
- grupiranje.

Isti avtor zgodbanje deli na:

- začetno postavljanje ključnih vprašanj,

- ovrednotenje predznanja, oceno možnosti uporabe znanja ter potreb po novem znanju;

- nevihto možganov kot iskanje možnih rešitev zastavljenega problema,

- ustvarjanje ozadja zgodbe in njeno umeščanje,

- ustvarjanje, raziskovanje in oblikovanje likov in njihovih življenj, s čimer krepimo odgovornost za potek zgodbe,

- predvidevanje napričakovanih situacij, dogodkov in zapletov ter odzivanje nanje,

- raziskovanje in razreševanje novo nastalih izzivov,

- opredelitev friza, to je priložnosti za predstavitev ugotovitev širši javnosti,

- evalvacijo in samoevalvacijo, povzemanje celotne izkušnje in ugotovitev zgodbe ter primerjavo le te z realnim svetom (Creswell, 1997, pp. 7–8).

Pri načrtovanju mora učitelj zastaviti ustrezno nadgrajevanje vseh štirih jezikovnih spretnosti. Pri tem mora upoštevati kognitivno težavnost nalog, ustrezno časovno načrtovati organizacijo in izpeljavo pouka, predvideti, kdaj bo nova učna snov podana in kdaj utrjena ter načrtovati, kakšna gradiva in drugi materiali bodo pri tem potrebni (Brandford, 2007, p. 68).

MOŽNOST UPORABE PRISTOPA STORYLINE PRI TUJEM JEZIKU V PROGRAMU LOGISTIČNI TEHNIK:

Z zgoraj opisano teorijo lahko ustvarimo v razredu v programu logistični tehnik virtualno podjetniško izkušnjo in jo povežemo z angleščino.

Po načelih pristopa Storyline vedno pričnemo z iskanjem predznanja. Dijaki se torej najprej vprašajo, kaj že vejo o podjetništvu, koliko znanja imajo o logističnih storitvah in kakšno storitev lahko s svojim trenutnim znanjem ponudijo na trgu kot posamezniki ali kot skupina.

Pristop Storyline nadaljuje s postavljanjem ključnih vprašanj. Dijake spodbujamo, da razmišljajo, kakšno podjetje bi lahko ustanovili, kakšne storitve bi lahko ponujali na trgu in kaj bi lahko s tem doprinesli gospodarstvu.

Nato sledi faza postavljanja izhodišč za delovanje podjetja in njihovega raziskovanja. V primeru logističnega tehnika bomo projekt Storyline nadaljevali z razmišljanjem o tem, da bomo na internetu najprej poiskali potencialne partnerje, to pa so lahko podjetja, ki se ukvarjajo z logistiko ali pa podjetja, ki potrebujejo logistične storitve. Razmislili bomo, kakšne storitve bi jim lahko nudili. Za podjetja bi lahko na primer prevajali njihove predstavitvene kataloge, prevajalli navodila za delovanje, logistično dokumentacijo ali pravila poslovanja v različnih državah ter jih seznanjali z aktualnimi novostmi v stroki.

Sledi ustvarjanje vlog in likov v zgodbi, kjer si dijaki razdelijo delo. V našem primeru je ideja zgodbe delovanje podjetja, kjer nekdo na primer prevzame vlogo menedžerja, drugi tajniške posle … in tako si razdelijo vsa delovna mesta, potrebna za delovanje podjetja.

V okviru raziskovanja bomo organizirali projektni teden, v katerem bomo se medpredmetno povezali s stroko in tako pripravili ponudbo sodobnih logističnih rešitev in storitev.

Zbrane podatke raziskovanja bomo oblikovali in izdelali friz oziroma nekakšno vizualno predstavitev rezultatov raziskovalnih nalog. Kontaktirali bomo zainteresirana slovenska ali tuja podjetja in jim predstavili naše podjetniške ideje oziroma novosti v stroki in ponudili možnost sodelovanja.

Na koncu bomo izvedli samoevalvacijo in fokusno skupino celotnega projekta, nato pa pripravili zaključno prireditev. Na zaključni prireditvi je zelo pomembno, da ne le predstavimo svoje delo, ampak tudi povabimo strokovnjake in podjetnike na tem področju, da ti ovrednotijo naše delo še iz njihove perspektive ter s tem osmislijo naše delo.

Tudi ocenjevanje znanja je možno izvesti po načelih pristopa Storyline. Skozi celoten čas poteka projekta namreč dijaki pišejo dnevnike v obliki dnevnih poročil svojih aktivnosti, tako kot bi to počeli, če bi bili zaposleni v pravem podjetju. Učitelj lahko tako na koncu oceni dnevnike, oddana poročila, izdelke, ustne predstavitve posameznih logističnih storitev ali produktov, pa tudi končno celoto, ki jo je posameznik predstavil kot svoje delo in doprinos k projektu na zaključni prireditvi. Ocenjujemo lahko tudi posamezno izvedbo dramskih aktivnosti ali igranja iger vlog. Če dijaki na primer zaigrajo pogovor med stranko in logističnim delavcem, lahko pri tem ocenimo govorno sporočanje in rabo funkcijskega jezika, kot je zmožnost komuniciranja s strankami, postavljanje vprašanj v zvezi z izdelkom ali storitvijo, podajanje navodil za delo, itd. Pri tem je možno upoštevati enake standarde znanja, kot jih sicer predvideva učni načrt za program logistični tehnik.

ZAKLJUČEK:

Mednarodno priznan in uveljavljen pedagoški pristop Storyline temelji na svoji inovativni didaktiki poučevanja in na zgodbi, ki dijake vodi do lastnega odkrivanja novih informacij in urjenja veščin in spretnosti. Dijaki se preko sodelovanja v zgodbi o ustanavljanju in delovanju lastnega logističnega podjetja naučijo strokovno terminologijo v tujem jeziku, podjetništva, raziskovanja, komuniciranja s strankami… torej tako vsebin strokovnih modulov kot uporabe znanj splošno-izobraževalnih predmetov.

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ŠOLSKI CENTER CELJE

Srednja šola za kemijo, elektrotehniko in računalništvo

Eva Boh, teacher of the English language and English literature

CONNECTING WITH ECONOMY WITH THE HELP OF THE TEACHING METHODS OF STORYLINE IN AN ESP CLASSROOM FOR LOGISTICS TECHNITIANS

ABSTRACT:

The article studies the use of Storyline as teaching methodology in an ESP (English for Specific Purposes) classroom for logistics technicians.

Firstly English is defined in terms of its status in vocational education and its role in the curriculum. The article continuous with the issue of cross-curricular integration between English and expert subjects thus offering ideas on how to incorporate expert terminology as well as language knowledge.

What follows is a description of the Storyline method, from its beginnings and needs to its characteristics and key elements.

The article concludes with an example of the plan of a Storyline project for logistics technicians. The presentation includes the description of individual stages of Storyline for logistics technicians and possibilities of cooperation with economy for the purposes of the learning process. In English classroom students prepare translations of new terminology used in logistics for Slovenian companies or they help communicate with clients and partners from abroad, participate in the translation of the logistic documents and regulations for specific countries or logistic services of individual companies.

KEY WORDS: Storyline, expert terminology, teaching methodology, cross-curricular integration

INTRODUCTION:

Modern English language teaching strives towards cross-curricular integration. Foreign language teaching in the higher vocational schools is based on inclusion of expert topics, in this case logistics and transport.

Through years different doctrines have been formed regarding the inclusion of expert terminology, ranging from simple translations of individual vocabulary items to modern teaching approaches. One such approach is also internationally established method called Storyline. With this approach English language teaching is based on a story which connects all learning topics into a meaningful whole. This approach is especially effective when applied to real circumstances, such as situations of students' future employment. Research, therefore, shows that this approach is especially effective for teaching expert terminology in vocational education.

ANGLEŠČINA KOT JEZIK STROKE:

ENGLISH AS THE LANGUAGE OF THE PROFESSION:

National Education Institute Slovenia has identified the subject of English in the curriculum for secondary school (Zavod RS za šolstvo, 2018, p. 1) as a key factor in the process of globalization, especially since Slovenia became a part of the European Union, as knowledge of a foreign language allows us better access to information, more intensive mutual cooperation in the cultural and economic field, deeper mutual understanding and respect for diversity. The curriculum proposes modern approaches, information and communication technology and the presentation of useful and lifelong learning content, as well as intercultural awareness.

In the subject of English in secondary vocational and technical education, great emphasis is placed on English as the language of the profession or professional English (English for specific purposes - ESP). Professional English can therefore be defined as the teaching and learning of specific skills and language required for a particular group of students and for a particular purpose (Krzanowski, 2010, p. 4).

However, since we can never fully predict in which foreign language situations students will find themselves in their profession, it is very important that we not only teach students a certain set of professional terminology and selected chapters of grammar, but also train them in skills such as creative thinking, asking key questions, making hypotheses and doing their own research for problem-solving. Only in this way will we equip them with the knowledge needed for new situations, so that they will be able to find the right sources of information, evaluate them critically and use them appropriately.

DESCRIPTION OF THE STORYLINE APPROACH:

Foreign language teaching should not be rigidly designed and predetermined, but should be based only on a set of validated and scientifically proven flexible pedagogical recommendations, procedures and principles (Ur, 2013, p. 468). Storyline approach enables all the above mentioned characteristics.

Creswell (1997, pp. 7–8) defines the key elements of Storyline as:

- Initial key questions, with which we evaluate students' prior knowledge and identify knowledge gaps;
- Dividing the story into individual chapters, so that we can cover all topics;
- A frieze or a presentation space, which enables the presentation of students' findings and contributions to the general public;
- Each student has his or her own role, which he or she forms and internalizes;
- Unforeseen and unplanned situations can arise during the story that need to be resolved, and such situations encourage students to respond creatively and solve problems, and this can also be the basis for expanding and upgrading knowledge;
- The story ends with a presentation, which enables reflection on what has been learned, an overview of learning achievements and an assessment of the achievement of learning goals.

The story is the main guide of our thoughts (Langer, 1967, p. 261), which allows us a natural way of thinking and making sense of the world around us (Cremin & Flewitt, 2017). Therefore, we want the teaching of a foreign language to be also based on that, but this is something that it is difficult to recreate in the classroom with classical teaching methods. The introduction of stories into lessons can help us to contextualize foreign language lessons and connect them with real-world experiences (Kirkgöz, 2012, p. 110). This also introduces an effective model of using a foreign language for students (Ur, 1999, p. 89) and of language in use (Winch, 2002, p. 365). The effectiveness of the use of stories in foreign language teaching is also noted by Ellis and Brewster (2014, pp. 6–7). The authors emphasize the motivational role of stories and theeir effects on students' imagination, as Storyline is fun, educational, attractive, it engages all students and makes them active co-creators of the story.

The founder of the Storyline approach Steven Bell (Bell, 2008, p. 63) argues that the quality of a teacher should be measured by how well his students know how to teach themselves. The story approach is based on students first assessing and evaluating their prior knowledge, asking themselves key questions, formulating ideas for solutions, seeking validations of ideas, adapting them to expected results, and finally evaluating what they have done. Nowadays when the Internet gives us quick access to all information, curricula are increasingly moving away from teaching based on information and facts, and moving towards teaching abilities, skills and how to find information, critically evaluate it and use it properly, as well as how to deal with problems, creatively seek solutions, formulate your own ideas, and also learning to learn, notes Bell (Bell, 2008, p. 61).This author continuous by seeing stories, set in time and space, in such a way that students themselves can have an influence on them with forming key questions and finding creative solutions to problem-solving tasks (Bell & Harkness, 2016a, p. 18).

The Storyline approach is therefore a research approach in all phases of the process of the story, namely in the initial phase of the key questions formulation, in the process of defining the problem, formulating the

idea of its solution, testing the proposed solution, evaluating it and designing the final solution (Järvinen, 2007, p. 53).

The essential difference between the Storyline approach and other didactic approaches is that it prepares students for an initiative and creative learning environment by introducing students to active work through real learning situations and topics, encouraging collaborative learning, including "soft" skills, developing language competences, as well as improving writing skills, mathematical, ICT and research skills, and the ability to evaluate, present and substantiate one's findings and results (Wrigley, 2007, p. 171).

The Storyline approach differs from other modern pedagogical approaches of English language teaching also because it focuses on the student and his or her activity and project work, by including emotions and moral values in the story (Mitchell, 2016, p. 32) and thus providing personal approach to teaching (Bell & Harkness, 2016b, pp. 21–22).

The use of the Storyline approach is increasingly included in foreign language teaching, as it has proven to be an effective tool, which is also supported by scientific research and presentations at many international conferences and in many reputable journals and other publications.

LESSON PLANNING WITH THE STORYLINE APPROACH:

Creswell (1997, p. 13) mentions four basic areas in Storyline planning and implementation:

- preparation of the schedule,

- storytelling,

- forming groups, and

- grouping.

The same author divides the story into:

- initial formation of key questions,

- the evaluation of prior knowledge, assessment of the possibilities of using the existing knowledge and learners' needs for new knowledge;

- a brainstorming session as a search for possible solutions to a problem,

- creating the background of the story and its placement,

- creating, researching and shaping characters and their lives, thus strengthening responsibility towards the course of the story,

- anticipating and responding to expected situations, events and complications,

- researching and addressing new challenges,

- the definition of the frieze, which is the opportunity to present the findings to the general public,

- evaluation and self-evaluation, summarizing the whole experience and comparing it with the real world (Creswell, 1997, pp. 7–8).

When planning, the teacher must set an appropriate upgrade of all four language skills. In doing so, he or she must take into account the cognitive difficulty of the tasks, plan the organization and delivery of the lesson plans appropriately, anticipate when the new topic will be given and when it will be consolidated, and plan which materials will be needed (Brandford, 2007, p. 68).

POSSIBILITY OF USING THE STORYLINE APPROACH IN A FOREIGN LANGUAGE IN THE LOGISTICS TECHNICIAN PROGRAM:

With the theory described above, we can create a virtual entrepreneurial experience in the classroom in the logistics technician program and connect it to the English classroom.

Following the principles of the Storyline approach, we always start by looking for prior knowledge. Students first ask themselves what they already know about entrepreneurship, how much knowledge they have about logistics services and what services they can offer on the market with their current knowledge as individuals or as a group.

The students in the Storyline approach continue by asking key questions. We encourage students to think about what kind of company they could set up, what services they could offer in the market and what they could do to be helpful to the local businesses.

This is followed by the phase of setting the starting points for the operation of the company and their research. In the case of a logistics technician, we will continue the Storyline project by thinking about finding potential partners on the Internet first, which can be companies that deal with logistics or companies that need logistics services. We will consider what services we could offer to them. For example, students could translate presentation catalogs of various companies, translate operating instructions, logistics paper work or business regulation in different countries, and keep businesses informed of current developments in the field.

This is followed by the creation of the roles and characters in the story, which students divide among themselves. In our case, the idea of the story is the operation of the company, where, for example, someone takes on the role of a manager, others do secretarial work… and thus each student is assigned to a specific job needed for the company to operate.

As part of the research, we will organize a project week, in which we will connect with the teachers of expert subjects in a cross-curricular integration and thus prepare an offer of modern logistics solutions and services.

The collected research data will be designed and made into a frieze or a kind of visual presentation of the results of the research tasks. We will contact potential Slovenian or foreign companies and present them with our entrepreneurial ideas or innovations in the field and offer the possibility of cooperation.

In the end, we will conduct a self-evaluation and a focus group of the entire project, and then prepare the final event. At the end of the Storyline project, it is very important not only to present the work, but also to invite experts and entrepreneurs in this field to evaluate the work from their perspective and thus make our work meaningful.

Knowledge assessment can also be carried out according to the principles of the Storyline approach. Throughout the project, students write diaries in the form of daily reports of their activities, just as they would if they were employed in a real company. In the end, the teacher can evaluate the diaries, submitted reports, products, oral presentations of individual logistics services or products, as well as the whole process, which the individual presented at the organized event at the end of the project. We can also evaluate an individual performance of dramatic activities or role-playing. For example, if students act out a conversation between a customer and a logistics worker, we can assess oral communication and the use of language functions, such as the ability to communicate with customers, ask questions about a product or service, give work instructions, and so on. It is possible to apply the same standards of knowledge as otherwise provided by the curriculum for the logistics technician program.

CONCLUSION:

Storyline is an internationally recognized and established pedagogical approach, which is based on its innovative teaching methodology and on a story that leads students on their way to discovering new information and practicing skills on their own. Through participation in the story about the establishment and operation of their own logistics company, students learn professional terminology in a foreign language, entrepreneurship, research, communication with customers… and therefore acquire skills needed to actively use both, the content of professional modules, and the use of knowledge of general education subjects.

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ŠOLSKI CENTER CELJE
Višja strokovna šola

mag. Andreja Jelen Mernik, univ. dipl. matem.

BO STROJ NADOMESTIL UČITELJA?

POVZETEK

Z vsakim novim tehnološkim izumom v zgodovini se je vedno pojavilo vprašanje: »Ali bo izum nadomestil učitelja?« in vsakič je čas pokazal, da je »klasični« učitelj še vedno potreben in najbolj učinkovit. Novi tehnološki dosežki so poučevanje lahko dopolnjevali, ga popestrili, niso pa mogli enakovredno zamenjati učitelja.

Tehnologija lahko, če je ustrezno uporabljena in umeščena v vzgojni proces, olajša in izboljša učiteljevo delo, omogoča vedno boljše čutno zaznavanje, ponazoritve, prikaze…, ne more pa nadomestiti učiteljevega vzgojnega momenta. Komunikacija med učiteljem in učencem se še vedno kaže kot najučinkovitejši model učenja. Prav tako ne smemo pričakovati, da bomo s tehnologijami dosegli to, česar morda sami v vlogi učitelja ne uspemo, to je aktiviranja in motiviranja učencev.

KLJUČNE BESEDE: izobraževalne tehnologije, strojno učenje, sodobna šola

TEHNOLOŠKI MEJNIKI, KI SO VPLIVALI NA IZOBRAŽEVANJE

V zadnjih desetletjih je tehnologija izredno napredovala na področjih prometa, logistike, komunikacij, pridobivanja in rabe energije, pridelave hrane, nano proizvodnje, medicine, zelene kemije itd. S svojo prisotnostjo vpliva na naš način življenja in nam lajša opravljanje vsakodnevnih opravil. Tehnologija se iz dneva v dan hitreje razvija, zato je pomembno, da se vsak pposameznik zaveda njenega vpliva in uporabe na vseh področjih življenja (Gagel, c. W. 1997, Literacy and Tehnology; Reflections and insight for technological literacy, Journal of Industrial Teacher Education;34,3, str 3-34,

Ob vsakem novem tehnološkem izumu se začne razmislek, kako ga vključiti in uporabiti tudi v izobraževanju. Ob vsakem novem tehnološkem izumu, ki ga začnemo uporabljati v izobraževanju, pa se postavi vprašanje, ali ta izum lahko nadomesti delo učitelja.

KNJIGE

Prve knjige so bile namenjene temu, da se je v njih beležilo in ohranjalo znanje. Tako so omogočale prenos znanja oziroma učenje naslednjim rodovom.

Do iznajdbe tiskarskih strojev je bilo takšno učenje privilegij peščice ljudi, ko pa so se pojavile tiskane knjige, ki so omogočale večjo dostopnost, so bile širšim množicam dane možnosti za učenje s pomočjo knjig, torej za samoučenje..Množična dostopnost do knjig je bil sicer eden od temeljev za boljše in predvsem bolj množično izobraževanje, vendar samo to ni bilo dovolj; potreben je bil tudi učitelj, knjige pa so bile predvsem pripomoček za učitelja.

RADIO IN TELEVIZIJA

Že kmalu po prvem radijskem prenosu leta 1906 se je začelo razmišljati o možni uporabi te nove iznajdbe v izobraževanju. Načrti so šli v dve smeri.

Ocenjevali so, da bo radio lahko rešitev za poučevanje na daljavo na področjih, kjer je težko organizirati pouk v šolah. Zaradi velike oddaljenosti med naselbinami in težavnih vremenskih razmer so v prejšnjem stoletju na takšen način izvajali pouk v nekaterih redko naseljenih predelih Avstralije in Kanade. Kot primarno sredstvo izobraževanja se uporablja še danes, npr. na Tajskem se preko radia uči matematiko, v Maliju se uporablja za trening bralne pismenosti, v Nigeriji pa po radiu lahko spremljajo prispevke povezane z agrikulturo (Sarmah in Lama, 2017).

Načrtovali so tudi pripravo posebnih radijskih ur za vso populacijo. Te ure naj bi vodili najboljši, najbolje pripravljeni in najbolj strokovno usposobljeni učitelji, ki naj bi bili zamenjava za »povprečne« učitelje, s čimer bi širokim množicam omogočali najkvalitetnejše izobraževanje.

Že ko so leta 1928 v Ljubljani slovesno odprli radijsko postajo, so v njej ustanovitelji videli predvsem pomembno izobraževalno ustanovo in so jo nato šele sčasoma prilagodili zahtevam poslušalcev. Pripravljali

so različna predavanja, jezikovne tečaje, otroške, mladinske, ženske, šolske, nacionalne ure ter radijske igre (Pirc, 2005, str. 40) .

Ob pojavu televizije so tudi ta medij podobno kot radio že pred drugo svetovno vojno začeli uporabljati v izobraževanju. Televizija je omogočala predvsem bistveno bolj učinkovite prikaze in ponazoritve.

Kljub velikim pričakovanjem se je hitro pokazalo, da ta medija ne moreta nadomestiti klasičnega poučevanja, ampak sta lahko le njegova poživitev in dopolnilo.

UČNI STROJI

Medtem ko radio in televizija nista bila namensko razvita za potrebe poučevanja, pa so sredi prejšnjega stoletja izdelali prve namenske učne stroje. Ti stroji pa niso bili razviti kot nadomestek za učitelje, ampak kot njihov pripomoček in naj bi jih predvsem razbremenili dolgočasnih rutinskih opravil, kajti ti učni stroji so bili namenjeni za preverjanje in utrjevanje znanja. Njihova prednost pa je bila poleg razbremenitve učiteljev tudi v tem, da so omogočali bolj individualen pristop.

PROJEKCIJSKE NAPRAVE

V prejšnjem stoletju smo v šole uvedli uporabo projekcijskih naprav. To so bile optične naprave za povečanje in projeciranje:

- diaprojektorji in grafoskopi so bili namenjeni povečanju in projeciranju prosojnih slik,
- episkopi so omogočali tudi projeciranje neprosojnih slik.

Te naprave naj bi bile namenjene konkretizaciji in boljši ponazoritvi, pogosto pa so jih žal učitelji uporabljali kar kot sredstvo za svojo razlago. Ta napačna uporaba je bila verjetno razlog, da so bili ti pripomočki slabo učinkoviti in so jih po nekaj letih zelo intenzivne uporabe začeli opuščati.

FONOLABORATORIJI

Sredi prejšnjega stoletja so v šole začeli uvajati fonolaboratorije. To so bili namenski učni stroji, ki so temeljili na uporabi magnetofonov, namenjeni pa so bili predvsem poučevanju tujih jezikov. Tudi pri fonolaboratorijih je bila podobno kot pri projekcijskih napravah smiselna uporaba le pri nekaterih delih pouka in se jih je učinkovito lahko uporabljalo le v majhnem deležu ur, zato so jih v šolah predvsem zaradi težav pri organizaciji urnikov hitro začeli opuščati.

RAČUNALNIKI

Uvajanje računalnikov v šole je omogočilo:

- predstavitvene programe, ki nadomeščajo projekcijske naprave, kot so diaprojektorji, grafoskopi in episkopi (Prezi, Power point…),
- oblikovanje predstavitev z uporabo umetne inteligence (Slidebean),
- soustvarjanje predstavitve v realnem času iz različnih lokacij (Keynote),

- kombiniranje različnih vrst medijev v eno večpredstavnostno predstavitev in aktivno vključevanje publike (SlideDog).

Vsi ti predstavitveni programi omogočajo multimedijske predstavitve, ki lahko vsebujejo fotografije, besedilo, animacije, zvoke, povezave na spletne strani…, ki so za učitelje zelo učinkoviti in enostavni pripomočki, vendar le, če so didaktično ustrezno umeščeni in uporabljeni v izobraževalnem procesu. (Pavlova, 2019, https://graphicmama.com/blog/7-popular-software-presentations/)

UČENJE NA DALJAVO

Danes uporabljamo tudi veliko orodij za lažje poučevanje na daljavo, kot so:

- Notion, ki združuje več orodij hkrati in omogoča skupne zapiske, dokumente in preglednice, skupno bazo znanja, vodenja nalog in zadolžitev, urnik ter pregled ocen,
- klepetalnice, kot sta npr. Skype in NetMeeting ali Slack za naprednejše klepetanje,
- skupinske razprave ali forume za izmenjavo mnenj,
- Zoom, Webex, Jitsi ali Microsoft Teams za videokonference in webinarje,
- Google Obrazci za ankete, kvize in interaktivne preizkuse znanja,
- interaktivno tablo Miro,
- YouTube…
- (Žvan, 2020, https://casoris.si/10-orodij-za-ucitelje-ki-jim-e-posta-ne-zadosca/)

DILEME UPORABE TEHNOLOGIJ V DANAŠNJI ŠOLI

Računalniško podprte tehnologije, posebej vedno večje uveljavljanje umetne inteligence, so zopet odprle vprašanje, kdaj bo stroj lahko nadomestil človeka. S pojavom računalnikov je bila prvotna ideja ta, da naj bi vsi učenci temeljito poznali delovanje računalnikov, ker bomo le tako lahko čim bolj izkoristili njihove zmogljivosti. Z izredno hitrim razvojem računalniških orodij pa smo kmalu prišli do tega, da za njihovo uporabo ne potrebujemo znanja o delovanju teh orodij, ampak moramo samo vedeti, kako te tehnologije uporabljati.

Didaktik dr. Damijan Štefanc iz oddelka za pedagogiko in andragogiko Filozofske fakultete Univerze v Ljubljani takole primerja uporabo tehnologije z magijo: »Je nekaj, česar ne razumemo čisto dobro in samo slutimo lahko, česa vsega je (ali bi lahko bila) zmožna. Prav zato, ker se izmika temu, da bi jo lahko popolnoma dojeli, je – podobno kot magija – hkrati vir fascinacije, upanja, in po drugi strani bojazni.« (Štefanc, 2019, https://video.arnes.si/ portal/asset.zul?id=K2KgHbYQWeUZfVbGHQLU0 LBP).

Čarovniške trike vidimo in se jim čudimo, čeprav vemo, da se za njimi skriva realna, običajno celo zelo trivialna razlaga, ki pa je ne doumemo, zato nas plašijo in zato se odmaknemo od njihove razlage. Podobno je z novimi tehnologijami: vemo, da so zmožne marsičesa, da lahko celo presežejo človekove sposobnosti, ne vemo pa, kako delujejo, zato se bojimo, da nam bodo tehnologije ušle izpod nadzora in podobno je tudi z uporabo tehnologij v šoli.

Po evropski raziskavi o uporabi IKT v izobraževanju izpred dveh let sodi Slovenija po digitalni opremljenosti na 12 mesto in je nad evropskim povprečjem, na področju uporabe tehnologij pri pouku pa zaostaja za evropskim povprečjem.

Večina učiteljev se sicer zaveda, da so minili časi, ko je bil učitelj edini vir znanja in da je pri sodobnem pouku nujna uporaba informacijsko komunikacijske tehnologije, kljub temu pa je delež njene uporabe pri pouku nizek. Vzroke za to lahko iščemo predvsem v tem, da naši učitelji niso dovolj izobraženi za takšne oblike dela, nimajo ustrezne strokovne podpore, pa tudi, da za to niso dovolj motivirani.

Tako dr. **Ivan Gerlič** s Pedagoške fakultete Univerze v Mariboru v svoji raziskavi ugotavlja, da je uporaba računalnikov v osnovnih in srednjih šolah med leti 1994 in 1998 naraščala zelo hitro, po začetnem zagonu pa so kasneje učitelji računalnike pri pouku uporabljali vse manj. Večji je bil delež uporabe pri naravoslovnih predmetih, zaskrbljujoče malo so z računalnikom pri pouku delali učitelji družboslovnih in humanističnih predmetov, večina učiteljev še vedno računalnik uporablja predvsem za pisanje priprav, poročil in dopisov.

Ob vseh dilemah, katere tehnologije so v šoli smiselne in uporabne, se moramo zavedati predvsem tega, da je tehnologija samo orodje in da je najbolj pomembno, kaj z njo storimo. Če učitelj ne zna izkoristiti vseh prednosti tehnologije in jo nekritično uporablja, uporaba tehnologije učnega procesa ne bo izboljšala, lahko ga celo poslabša.

Veliko šol je za nakup tehnološke opreme porabilo ogromno denarja, a pri tem niso bili pozorni na pedagoške cilje in učiteljev niso ustrezno usposobili. Brez tega pa ni mogoče ustvariti razmer za poučevanje, v katerih bi uporaba tehnologije dosegla svoj namen. Zato je pogosto prišlo do ugotovitev, da uporaba tehnologije v učnem procesu ni koristna, vendar bi se morali vedno, ko uporaba tehnologije ne izboljša učenja, najprej vprašati, če ne gre za problem v načinu njene uporabe. Če delo v razredu prilagodimo tehnološkim orodjem, si lahko s tehnologijo učni proces olajšamo in učenje pospešimo in izboljšamo, določena tehnologija nam lahko prihrani čas, denar, sredstva …

Zavedati se moramo, da tehnologija ne bo izginila. S tehnologijo se srečujemo povsod in si življenja brez nje ne znamo več predstavljati, roboti nadomeščajo človeka, umetna inteligenca omogoča nesluten razvoj, tehnologija dopolnjuje človeka, vstopa v njegovo telo, zato bodo tudi učitelji nenehno morali iskati nove poti učenja, ki bo vključevalo sodobne tehnologije.

STROJ LAHKO ZMORE VEČ IN BOLJE, A Z NJIM NE VZPOSTAVIMO ČUSTVENE VEZI

Od uporabe tehnologij imamo vsakič, ko se pojavi nova oblika, velika pričakovanja, upamo, da bomo z uporabo tehnologij dosegli to, česar nam sicer morda ne uspe, npr. da bodo udeleženci bolj motivirani, bolj aktivni, da bodo rezultati boljši. Pričakujemo torej, da bomo s tehnologijami dosegli to, česar sami v vlogi učitelja ne uspemo doseči.

Uporaba tehnologij pri pouku omogoča vedno boljše čutno zaznavanje, ponazoritve, prikaze… in v tem je tehnologija zagotovo lahko boljša od učitelja. Ne more pa tehnologija nadomestiti vzgojnega momenta

učiteljevega dela, kontakta med učiteljem in učencem, vplivanja na učenca, njune komunikacije in interakcije.

Vloga učitelja je, da uči (posreduje znanje) in da poskrbi, da učenci znanje usvojijo (jih vzgaja). Eden od vzrokov, zakaj danes stroj še ne more nadomestiti učitelja, je v tem, da s tehnologijo ne vzpostavimo čustvene vezi, ne bojimo se je, pred njo se ne sramujemo, če naredimo napako, nismo obremenjeni z njenim mišljenjem o nas, ne želimo je očarati, jo presenetiti…

Učitelj je uspešen toliko, kolikor ga učenci sprejemajo kot avtoriteto, tega odnosa pa učenci do stroja ne vzpostavijo.

TUDI ŠOLSKI SISTEM BO POTREBNO PRILAGODITI SODOBNIM TEHNOLOGIJAM

Vzporedno z vpeljavo novih tehnologij v šolski prostor moramo posodabljati tudi šolski sistem, katerega glavni cilj je, da producira izobražene ljudi. S tehnološkimi spremembami pa se spreminja tudi pojem izobraženosti. Danes v sodobnih okoljih izobraženost pomeni predvsem sposobnost vseživljenjskega učenja, samostojnega razmišljanja, inovativnosti in kreativnosti.

Temelji šolskega sistema, kot ga poznamo danes, so bili postavljeni v 19. stoletju, torej v času, ko še ni bilo računalnikov, interneta, robotov, umetne inteligence. Takrat je bila glavna naloga šolskega sistema mlade naučiti pisati, brati in računati in ta temeljna znanja so bila za večino prebivalstva dovolj, da so lahko uspešno funkcionirali v družbi. Bistvena komponenta učenja je bila memoriranje. V današnjem tehnološko naprednem svetu, ko fizična dela namesto ljudi prevzemajo roboti, umska dela pa nadomeščamo s strojnim učenjem in umetno inteligenco, se bo temu moral prilagoditi tudi šolski sistem in bo memoriziranje podatkov moral zamenjati za njihovo apliciranje.

Zaradi hitrih sprememb v družbi ter globalizacije je EU za eno od prednostnih nalog na področju izobraževanja postavila učenčevo doseganje višjih taksonomskih ravni znanj, doseganje njegovih digitalnih kompetenc in kompetenc 21. stoletja. Prožne oblike učenja in ustvarjanje inovativnih učnih okolij za uspešno učenje so v središču politik in raziskav na področju sodobnega izobraževanja.

Uporaba informacijsko-komunikacijske tehnologije v izobraževanju pa ne pomeni zgolj uporabe tehnologije pri poučevanju, temveč vključevanje v vse poglavitne sestavine izobraževalnega procesa, in sicer pedagoško, organizacijsko-tehnično ter vsebinsko. (Flogie, 2019, https://video.arnes.si/portal/asset.zul?id=L1UWZpBS9QnjTfMWhn9BnJdr)

ZAKLJUČEK: KOMU TOREJ POMAGA TEHNOLOGIJA?

Soočamo se z izzivi, ki jih sodobne tehnologije prinašajo na vsa področja življenja, tudi v vzgojo in izobraževanje. Procesom uveljavljanja vse bolj sofisticiranih tehnologij se ne moremo izogniti, postali so del učenja in izobraževanja ter vzgoje. To terja kritičen razmislek o tem, kako tehnologija spreminja prakse vzgoje, učenja in izobraževanja ter kako jo lahko najbolje uporabimo za razvoj dobrobiti posameznika ter

vključujoče in ustvarjalne skupnosti. (Filozofska fakulteta Univerze v Ljubljani, 2020, http://www.ff.uni-lj.si/novice/Pedagosko_ andragoski_dnevi_Vplivi_sodobnih_tehnologij_na_ucenje_izobrazevanje)

Zavedati se moramo, da tehnologije bolj pomagajo učitelju pri poučevanju kot učencu pri učenju. Učitelj s pomočjo sodobnih tehnologij lažje najde novosti, zanimivosti za popestritev, primere za aktualizacijo. Učenec pa še vedno potrebuje učitelja, ki mu vse to predstavi, prenese, naredi izbor, ovrednoti, osmisli, kritično presodi, kaj je smiselno in kaj je zanj uporabno.

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WILL THE MACHINE REPLACE THE TEACHER?

ABSTRACT

With every new technological invention in history, there is always one question that arises: “Will the invention replace the teacher?” In each case, time has shown that the “classical” teacher is still necessary and the most effective. The new technological dose can supplement and enrich the teacher, but it could have never equally replace the teacher.

The technology can be placed in the educational process, as it makes the teacer’s job easier, it enables better sensory perception, illustrations, displays…, but it does not replace the teacher's educational moments. Communication between the teacher and students is still said to be the most effective model of learning. Nor should we expect technology to achieve what we ourselves may fail to do as teachers, that is the activation of technology in motivating students.

KEY WORDS: educational technologies, machine learning, modern school

TECHNOLOGICAL MILESTONES AFFECTING EDUCATION

In recent decades, the technology has advanced tremendously in the fields of transport, logistics, communications, energy production and its use, food production, nano manufacturing, medicine, green chemistry, etc. With its presence, it impacts our way of life and makes it easier for us to perform daily tasks. Technology is evolving faster day by day, so it is important that each individual is aware of its impact in all areas of our lives (Gagel, c. W. 1997, Literacy and Technology; Reflections and insight for technological literacy, Journal of Industrial Teacher Education; 34.3, pp. 3-34).

With each new technological invention, a reflection begins on how to incorporate it and use it in education as well. With each new technological invention that we begin to use in education, however, the question arises as to whether this invention can replace the work of a teacher.

BOOKS

The first books were written in order to describe and preserve knowledge. In this way, they enabled the transfer of knowledge or learning to the next generations.

Until the invention of printing machines, such learning was the privilege of a handful of people, but when printed books appeared, this enabled greater accessibility and more people were given opportunities to learn with the help of books, in a form of self-learning. Books being widely accessible was one of the foundations for widely educating masses, but that alone was not enough; a teacher was also needed, and books were primarily meant as a tool for the teacher.

RADIO AND TELEVISION

Soon after the first radio broadcast in 1906, the possible use of this new invention was considered in educational terms. The trends went in two directions.

They estimated that radio could be a solution for distance teaching in areas where it is difficult to organize lessons at schools. Due to the great distance between settlements and difficult weather conditions, classes were conducted in this way in some areas of Australia and Canada in the last century. As a primary source of education it is still used today, e.g. in Thailand where mathematics is taught via radio, in Mali it is used for reading literacy training, and in Nigeria advancements in agriculture are introduced via radio (Sarmah and Lama, 2017).

They also planned to prepare special radio hours for the whole population. These classes are supposed to be led by the best, the best prepared and most professionally trained teachers, who should be a replacement for "average" teachers, thus providing the widest audiences with the highest quality education.

Already when the radio station was ceremoniously opened in Ljubljana in 1928, the founders saw it as an important educational institution and adapted it to the requirements of the listeners. They prepared various

lectures, language courses, children's, youth, and women's school, national lessons and radio plays (Pirc, 2005, p. 40).

With the invention of television, this medium, like radio, began to be used in education before the Second World War. Above all, television enabled significantly more effective displays and illustrations.

Despite high expectations, it quickly became clear that media could not replace classical teaching, but could only revive and complement it.

LEARNING MACHINES

While radio and television were not purposely developed for teaching purposes, the first dedicated learning machines were manufactured in the middle of the last century. However, these machines were not developed as a substitute for teachers, but as their tool and were supposed to relieve them of boring routine tasks, because these learning machines were intended to test and consolidate knowledge. Their advantage, in addition to relieving teachers, was that they enabled a more individual approach.

PROJECTION DEVICES

In the last century, we have introduced the use of projection devices at schools. These were optical devices for magnification and projection:

- slide projectors and overhead projectors were designed to enlarge and project translucent images,
- they also made it possible to project opaque images.

These devices were supposed to be intended for concretization and better illustration, but unfortunately teachers often used them as a means of their interpretation. This misuse was probably the reason that these devices were poorly effective and began to be abandoned after a few years of very intensive use.

PHONOLABORATORIES

In the middle of the last century, phonolaboratories began to be introduced in schools. These were dedicated learning machines based on the use of tape recorderings, and were intended primarily for teaching foreign languages. As in the case of phonolaboratories, as in the case of projection devices, it was meaningful to use them only in certain types of classes and they could only be used effectively for a small proportion of hours, so schools quickly abandoned them, due to difficulties in organizing schedules.

COMPUTERS

The introduction of computers in schools has enabled:

- demonstration programs replacing projection devices such as slide projectors, overhead projectors, etc. (Prezi, Power point…),
- creating presentations using artificial intelligence (Slidebean),
- co-creation of a real-time presentation from different locations (Keynote),
- combining different types of media into one multimedia presentation and active involvement of the audience (SlideDog).

All these presentation programs enable multimedia presentations, which can contain photos, text, animations, sounds, links to websites…, which are very effective and simple aids for teachers, but only if they are methodologically properly used in the educational process. (Pavlova, 2019, https://graphicmama.com/blog/7-popular-software-presentations/)

DISTANCE LEARNING

Today, we also use many tools to facilitate distance learning, such as:

- Notion, which combines several tools at the same time and provides common notes, documents and spreadsheets, a common knowledge base, task and task management, schedule and review of grades,
- chat rooms, such as Skype and NetMeeting or Slack for more advanced chatting,
- group discussions or forums for the exchange of opinions,
- Zoom, Webex, Jitsi or Microsoft Teams for video conferencing and webinars,
- Google Forms for surveys, quizzes and interactive knowledge tests,
- Miro interactive whiteboard
- YouTube…

(Žvan, 2020, https://casoris.si/10-orodij-za-ucitelji-ki-jim-e-posta-ne-zadosca/)

DILEMMAS OF THE USE OF TECHNOLOGIES IN TODAY'S SCHOOL

Computer-aided technologies, especially the growing use of artificial intelligence, have reopened the question of when a machine will be able to replace humans. With the invention of computers, the original idea was that all students should have a thorough knowledge of how computers work, because only then will we be able to make the most of their capabilities. With the extremely rapid development of computer tools, however, we soon realized that use we do not need the knowledge of how these tools operate, but rather than that we need to know how to use these technologies.

Teaching methodologist dr. Damijan Štefanc from the Department of Pedagogy and Andragogy at the Faculty of Arts, University of Ljubljana compares the use of technology with magic: “It is something we do not understand very well and we can only guess what it is (or could be) capable of. Precisely because it eludes being fully understood, it is - like magic - at the same time a source of fascination, hope, and on the other hand fear. ”(Štefanc, 2019, https://video.arnes.si/ portal /asset.zul?id=K2KgHbYQWeUZfVbGHQLU0 LBP).

We see and adore magic tricks, even though we know that there is a real, usually even very trivial explanation behind them, but we do not understand it, so they scare us and we move away from their explanation.

It is similar with new technologies: we know they are capable of many things, they can even exceed human capabilities, but we do not know how they work, so we are afraid technology will get out of control and it is similar with its use at school.

According to an European survey on the use of ICT in education two years ago, Slovenia ranks 12th in terms of digital equipment and is above the European average, while in the field of the use of technologies for the purposes of teaching it lags behind the European average.

Most teachers are aware that times when the teacher was the only source of knowledge are gone and that the use of information and communication technology is necessary in a modern classroom, but the its use in teaching is rare. The reasons for this can be found mainly in the fact that our teachers are not sufficiently educated for their useage, do not have adequate professional support, and also that they are not sufficiently motivated to do so.

So dr. Ivan Gerlič from the Faculty of Education of the University of Maribor states in his research that the use of computers in primary and secondary schools grew very fast between 1994 and 1998, but after the initial start-up, teachers later used computers less and less in classrooms. They are more widely used in science subjects, worryingly few teachers of social sciences and humanities worked with the computer in the classroom, most teachers still use the computer mainly for writing lesson plans, reports and letters.

With all the dilemmas questioning if technology is meaningful and useful at school, we must be aware of the fact that technology is just a tool and that what matters most is what we do with it. If a teacher does not know how to take the full advantage of technology and uses it uncritically, the use of technology will not improve the learning process, it may even make it worse.

Many schools spent a lot of money to buy technological equipment, but they did not pay attention to the pedagogical goals and did not train their teachers properly. Without this, however, it is not possible to create teaching conditions in which the use of technology would achieve its purpose. Therefore, it has often been found that the use of technology in the learning process is not useful, but whenever the use of technology does not improve learning, we should first ask ourselves if there is maybe a problem in the way it is used. If we adapt classroom work to technological tools, we can use technology to facilitate the learning process and speed it up and improve learning, a certain technology can also save us time, money, resources…

We need to be aware that technology will not disappear. We encounter technology everywhere and can no longer imagine our lives without it, as robots replace humans, artificial intelligence enables unimaginable development, and technology complements man, enters the body, etc., so teachers will constantly have to look for new ways of learning that include modern technologies.

A MACHINE CAN DO MORE AND BETTER, BUT WE DO NOT ESTABLISH AN EMOTIONAL CONNECTION WITH IT

Every time a new form of technology appear we have high expectations and we hope that by using this technology we will achieve what we might otherwise fail to do, e.g. that participants will be more motivated, more active, that results will be better. We therefore expect to achieve with technology what we ourselves, as teachers, fail to achieve.

The use of technologies in the classroom enables better sensory perception, illustrations, displays… and in this sense technology can certainly be better than the teacher. However, technology cannot replace the educational moment of the teacher's work, the contact between the teacher and the student, the influence on the student, their communication and interaction.

The role of the teacher is to teach (transfer knowledge) and to make sure that students acquire knowledge (get educated). One of the reasons why today the machine cannot replace a teacher is that we do not establish an emotional connection with technology, we are not afraid of it, we are not ashamed of it if we make a mistake, we are not stressed about what its thinks of us, we do not want to impress it, to surprise it…

The teacher is successful as much as the students accept him or her as an authority, and the students do not establish this relationship with the machine.

THE SCHOOL SYSTEM WILL ALSO NEED TO BE ADAPTED TO MODERN TECHNOLOGIES

Parallel to the introduction of new technologies in the school environment, we must also modernize the school system, whose main goal is to produce educated people. With technological changes, the concept of education is also changing. Today, in modern environments, education means above all the ability of lifelong learning, independent thinking, innovation and creativity.

The foundations of the school system as we know it today were laid in the 19th century, that is, at a time when there were no computers, the Internet, robots, or artificial intelligence. At that time, the main task of the school system was to teach young people to write, read and count, and this basic knowledge was enough for the majority of the population to be able to function successfully in the society. An essential component of learning was memorization. In today's technologically advanced world, where physical work is taken over by robots instead of humans, and mental work is replaced by machine learning and artificial intelligence, the school system will have to adapt and data memorization will have to be replaced by skills learning.

Due to rapid changes in the society and globalization, the EU has made the priorities in the field of education for the students to achieve higher taxonomic levels of knowledge, digital skills and other 21st century competencies. Flexible forms of learning and the creation of innovative learning environments for successful learning are at the heart of policies and research in the field of modern education.

The use of information and communication technology in education does not only represent the use of technology in teaching, but also integration into all the main components of the educational process, namely pedagogical, organizational-technical and content. (Flogie, 2019, https://video.arnes.si/portal/asset.zul?id=L1UWZpBS9QnjTfMWhn9BnJdr)

CONCLUSION: SO WHO BENEFITS FROM TECHNOLOGY?

We are faced with the challenges that modern technologies bring to all areas of life, including education. The process of implementing increasingly sophisticated technologies cannot be avoided, as they have become a part of learning, education and upbringing. This requires critical reflection on how technology is changing the practices of upbringing, learning and education, and how it can best be used to develop the well-being of the individual and an inclusive and creative community. (Faculty of Arts, University of Ljubljana, 2020, http://www.ff.uni-lj.si/novice/Pedagosko_andragoski_dnevi_Vplivi_sodobnih_tehnologij_na_ucenje_izobrazevanje).

We need to be aware of the fact that technologies help the teacher more to teach than they help the student to learn. With the help of modern technologies, the teacher can find new trends more easily, make the lessons

more interesting, provide updated examples. However, the student still needs a teacher who presents all this to him or her, transfers it, makes a choice, evaluates it, makes sense of it, critically assesses what makes sense and what is useful.

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Sebastjan Andrejc

mag. Roman Krajnc

ASISTENČNI SISTEMI ZA VARNOST V CESTNEM PROMETU

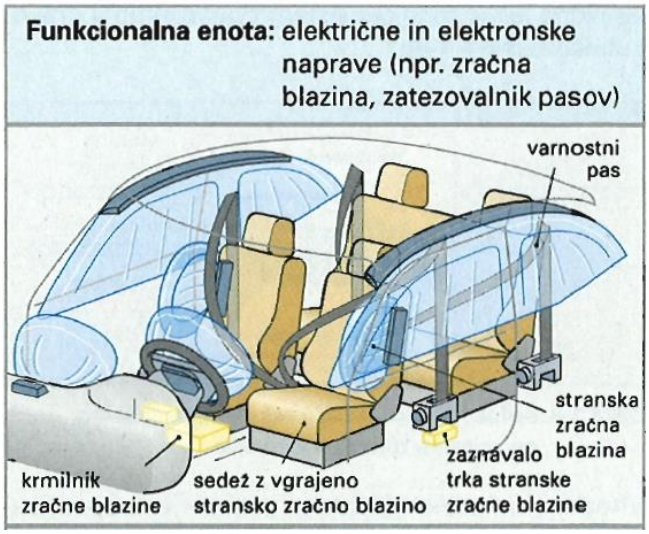
Namen sodobnih sistemov je, da vozniku pomagajo, da se prepreči eventualna prometna nesreča. Kljub uporabi tehnične opreme je voznik še vedno odgovoren za svoje ravnanje in vožnjo v cestnem prometu. To pomeni, da voznik ne sme »izkoriščati« sisteme na račun manjše pozornosti upravljanja vozila in spremljanja prometa. Dvig stopnje varnosti v prometu zahteva od konstruktorjev in proizvajalcev vozil, da sledijo smernicam za doseganje maksimalne varnosti vseh udeležencev v cestnem prometu. Lahko rečemo, da skorajda ni tehnično-tehnoloških ovir za doseganje le tega. Torej samo tako naprej, varno v promet. V prispevku je opisanih nekaj temeljnih asistenčnih naprav.

1. Pred desetletji

To je bilo obdobje, ko je bila tehnika v polni meri razvoja. Vozila so bila »enostavne konstrukcije«. Nekatera vozila niso imela vgrajenega servo ojačevalca zavor, saj so bila so brez servo volana in ABS sistema. Spomnimo se še na začetke vgrajevanja varnostih pasov. Varnostni pas je temeljni del varnostne opreme v avtomobilu - brez njega svoj pomen izgubijo vse ostale naprave za zagotavljanje pasivne varnosti (1). Varnostni pas ni že od vsega začetka sestavni del avtomobilov - njegova zgodovina je dolga dobrih 60 let. Prve varnostne pasove so v avtomobile, po zgledu trebušnih varnostnih pasov v letalih, začeli vgrajevati proti koncu petdesetih let prejšnjega stoletja, a zgolj kot dodatno opremo. Za začetek vgradnje tritočkovnih varnostnih pasov v avtomobile velja leto 1959, ko je švedski Volvo v svoja modela 121 Amazon in PV544 začel serijsko vgrajevati tritočkovni varnostni pas, ki je bil pripet na karoserijo avtomobila in je ob trku zadržal voznikovo telo na sedežu. Izumitelj tega varnostnega pasu je bil Nils Bohlin, ki je k Volvu prišel leta 1958 z izkušnjami pri razvoju sedežev v letalih, ki jih je bilo ob resni nevarnosti mogoče katapultirati iz letala.

Tako je bilo nekoč. Danes je situacija povsem drugačna. Vsi udeleženci v prometu se zavedamo pomena varnosti. Tako že nastaja velika konkurenca proizvajalcev vozil, ki tekmujejo, kdo bo ponudil boljšo in več opreme. Slika št. 3 prikazuje napredno funkcionalno enoto zračne blazine in varnostni pas.

Slika št. 1: Funkcionalna enota (2)



Dejstvo je, da so sodobni sistemi sestavni del vseh motornih vozil. Vsak udeleženec v prometu ali uporabnik prometne storitve želi imeti sistem, ki zadovoljuje njegove potrebe in pričakovanja. Zagotavljanje večje varnosti je mogoče s spodbujanjem udeležencev v prometu k odgovornejšemu vedenju, spoštovanju predpisov in oblikovanju zavesti o pomenu prometne varnosti ter z zagotavljanjem varnejših vozil in cestne

infrastrukture. Slednje lahko in hkrati morajo udejanjiti konstruktorji, proizvajalci, servisi vozil, projektanti in izvajalci infrastrukture.

2. Obremenitev vozila

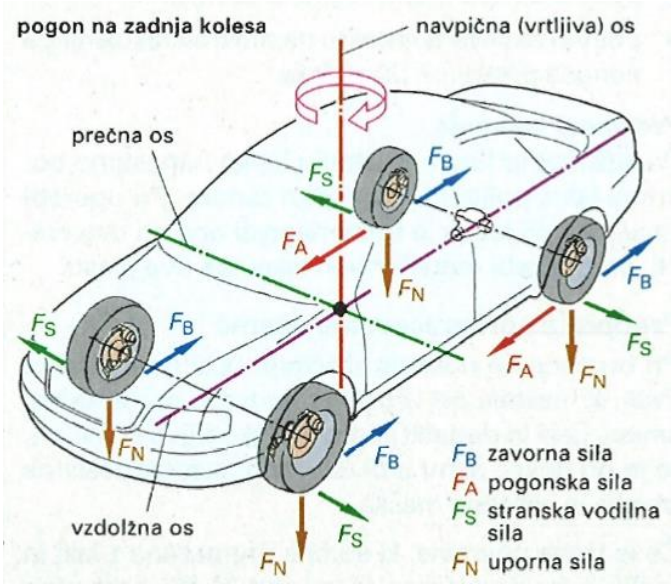
Po Zakonu o motornih vozilih (4) se lahko proizvodi dajo na trg in se začnejo uporabljati, če so skladni s tehničnimi zahtevami glede varnosti, zavarovanja življenja in zdravja ljudi, varstva okolja in z drugimi zahtevami vezanimi na vozila, če so bili njihova skladnost s predpisanimi tehničnimi zahtevami ter tehnično stanje in identiteta potrjeni v predpisanem postopku, če so označeni v skladu s predpisi, ki urejajo ugotavljanje skladnosti vozil. To je pogoj, da lahko pričakujemo, da so vozila konstruirana po določenih tehničnih pogojih. Na vozila vplivajo različne sile in upori. Obremenitev posameznih koles je pomemben podatek za vlečno in zavorno sposobnost vozila. Obremenitev koles je odvisna od (3):

- lege težišča vozila,
- nagiba ceste,
- upora zraka,
- vztrajnostnih sil,
- pospeška ali pojemka ...

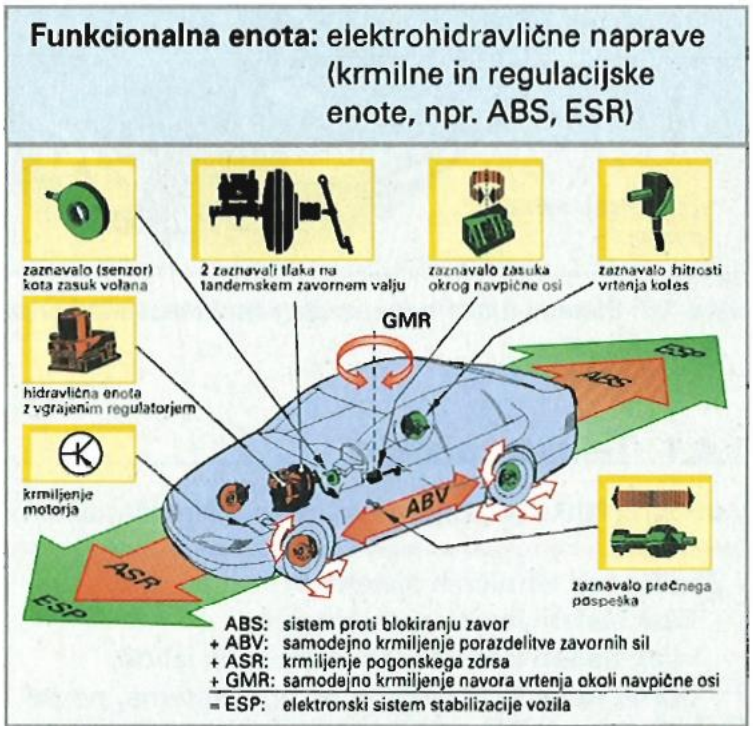
Upori v prometu so sile, ki se upirajo gibanju prevoznih sredstev. Nastanejo zaradi prevoznih sredstev samih ali zaradi vozne poti. Če želimo, da se vozilo giblje, moramo premagati vse upore. Upori pri vozilih so (3):

- upor pri kotaljenju koles,
- zračni upor,
- upor pri premagovanju strmine,
- upor pri pospeševanju oziroma zaviranju vozila.

Slika št. 2: Sile in osi na vozilu (2)



Prisotnost vse večjih in hitrejših vozil se izraža v dinamiki vožnje. Tako ni dvoma, da je v primerjavi s preteklostjo, danes zelo pomembno konstruiranje tehnik in tehnologij v vozilu, ki nudi podporo vozniku. Slika št. 2 prikazuje funkcionalno enoto ABS in ESR z ustrezno tehnično podporo.



Slika št. 3: Funkcionalna enota (2)

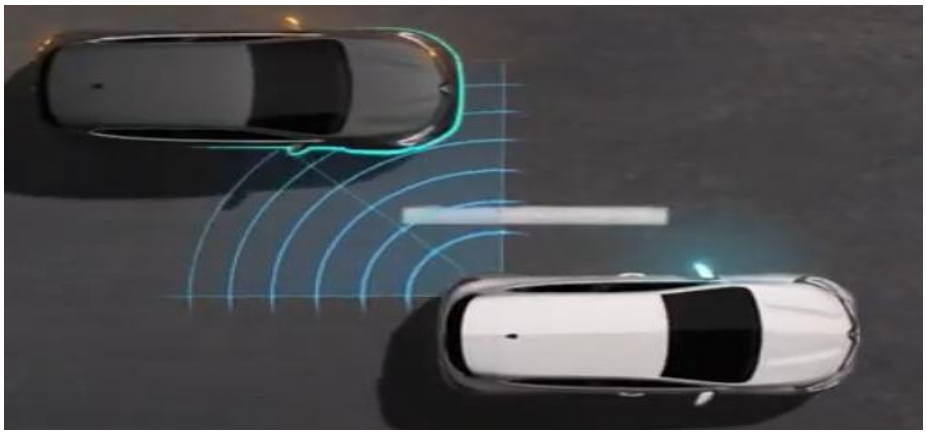
V nadaljevanju prispevka bomo opisali nekaj elementov – funkcionalnih enot, ki so bistveno dvignila nivo varnega upravljanja vozila. V prispevku se bomo omejili le na določene elemente asistenčnih sistemov za osebna vozila. Avtonomijo vozila ne bomo obravnavali, je pa priložnost za nadaljnje raziskovanje.

3. Nadzor mrtvega kota

Mrtvi kot je polje, ki ga voznik pri pogledu skozi okno ali v običajno ogledalo ne more videti. Zaradi mrtvega kota je veliko nesreč avtomobilov in tovornjakov, ko vozniki ne vidijo motoristov, kolesarjev ali pešcev, zlasti pri zavijanju v desno. Sistem za nadzor mrtvega kota s prikazom simbola v zunanjih ogledalih opozarja na prisotnost vozila v mrtvem kotu. Sistem, ki deluje po enakem načelu kot tipala za vzvratno vožnjo, je pomemben za varnost, še posebej pri mestni vožnji. Sistem deluje skupaj z opozorilnikom na nenamerno menjavo voznega pasu: poleg opozorilne lučke, ki sveti v vzvratnem ogledalu na ustrezni strani, voznik začuti popravek smeri vožnje, če prevozi talno črto z vključenim smernim kazalcem. Namen popravka je pomagati vozniku, da se izogne trčenju (5). Slika 4 prikazuje opozorilo o približevanju vozila v mrtvem kotu.

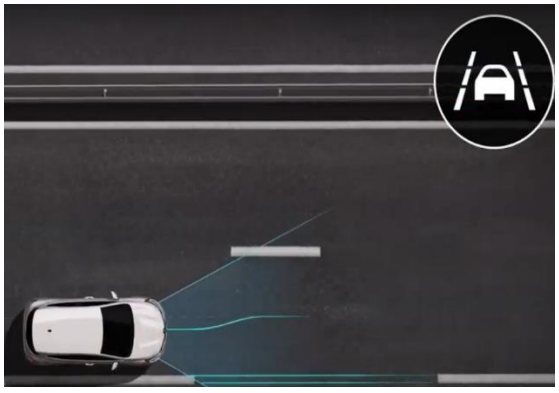
Slika št. 4: Opozorilo v vzratnem ogledalu (5)

Slika št. 5: Delovanje senzorja za nadzor mrtvega kota (6)



4. Opozorilnik za nenamerno menjavo voznega pasu

Opozorilnik za nenamerno menjavo voznega pasu je sistem, ki s pomočjo kamere za prepoznavanje prekinjene oziroma neprekinjene črte zaznava nenamerno vožnjo čez vzdolžno talno označbo, ki med seboj ločuje vozne pasove. Za varno vožnjo kamera analizira sliko. Če vozniku upade pozornost in se vozilo giblje s hitrostjo nad 80 km/h, ob odstopanju od smeri sproži vizualno in zvočno opozorilo. Med 65 km/h in 180 km/h aktivni opozorilnik na nenamerno menjavo voznega pasu ob tem sproži še popravek smeri vožnje: čim sistem ugotovi nevarnost nenamerne vožnje čez zaznano razdelilno talno črto, se volan postopoma obrača v drugo smer, da bi vozilo ohranil na trenutnem voznem pasu. Če voznik želi ohraniti smer gibanja vozila, lahko popravek prepreči tako, da čvrsto zadrži volan (na primer med izogibanjem oviri). Popravek se prekine, čim voznik vklopi smerne kazalce (6). Slika št. 6 prikazuje sistem za ohranjanje pozicije vozila na voznem pasu.



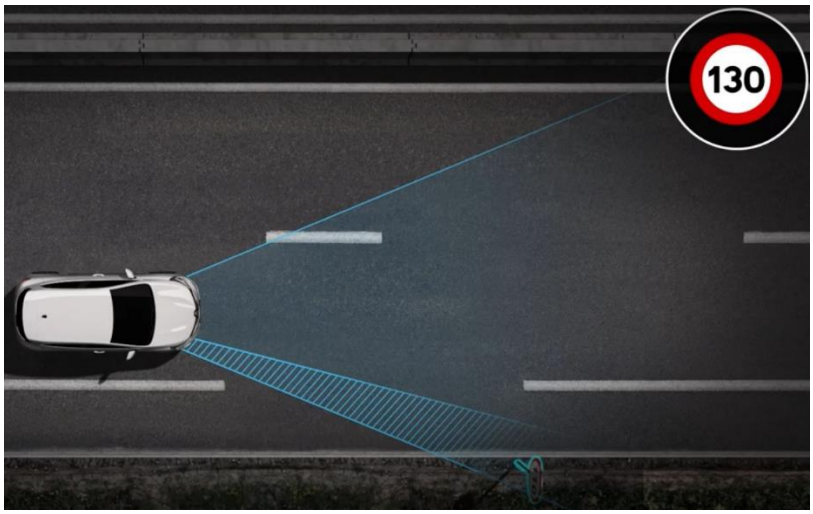
Slika št. 6: Sistem za ohranjanje vozila na voznem pasu (6)

5. Opozorilnik prekoračitve hitrosti s sistemom za prepoznavo prometnih znakov

Nenehno se srečujemo s pomanjkljivostjo, da določenih situacij ali prometnih znakov ne vidimo, oziroma jih ne zaznamo. Seveda to ni dobro, saj ne samo da kršimo zakonska določila za varno vožnjo, temveč ima lahko za posledico tudi prometno nesrečo.

Med vožnjo ste obveščeni o omejitvah hitrosti in opozorjeni, če prekoračite hitrost. Sistem, ki je opremljen s kamero, zbira, analizira in primerja podatke na prometnih znakih z informacijami na zemljevidih ter vas obvešča prek armaturne plošče in projekcijskega zaslona (odvisno od vozila in različice). Za večjo učinkovitost nastavite omejevalnik hitrosti na največjo zaznano vrednost (6). Slika št. 7 prikazuje sistem branja oz. prepoznavanje vsebine prometnega znaka

Slika št. 7: Opozorilnik prekoračitve hitrosti s sistemom za prepoznavanje prometnih znakov (6)



6. Aktivni varnostni pasovi

Aktivna varnostna pasova voznika in sovoznika sta opremljena z motorčkom, ki ob nevarnosti samodejno napne varnostni pas in tako doseže največjo možno zaščito. Pri hitrostih nad 10 km/h se nekoliko napneta in tako voznika in sovoznika prisilita v pravilno sedenje. Številnim poškodbam se je mogoče izogniti, če potniki pravilno sedijo na sedežih. Žal tega sistema še ni nameščenega na zadnjih sedežih (5). Slika št. 8 prikazuje delovanje zatezne sile na varnostnem pasu.

Slika št. 8: Aktivni varnostni pas (5)

7. Zasilni zaviralni sistem (Active Safety Break)

Active Safety Break je zasilni zaviralni sistem, ki je zasnovan tako, da preprečuje trčenje pri nizkih hitrostih. Zmanjša nevarnost za trčenje s prednje strani prek samodejnega zaviranja namesto voznika, ko hitrost preseže 5 km/h. Če sistem zazna nevarnost trka, pošlje vozniku jasno opozorilo. Če ni odgovora na signal, sistem samodejno zavira. Sistem zazna vozila, ki vozijo v isto smer ali mirujejo, prav tako sistem zazna tudi pešce na vozišču (koles, motorjev, živali in predmetov na vozišču sistem ne zazna). Sistem Active Safety Brake deluje v naslednjih pogojih:

- hitrost vozila med 5 km/h in 140 km/h, ko je zaznano premikajoče vozilo;

- hitrost vozila ne presega 80 km/h, ko je zaznano nepremično vozilo;

- hitrost vozila ne sme presegati 60 km/h, ko je zaznan pešec (5).

Slika št. 9 prikazuje sistem samodejnega zaviranja na osnovi zaznavanj nenadzorovanega približevanja oviri, to je vozila, pešec, idr.

Slika št. 9: Zasilni zaviralni sistem (5)

8. Sistem za pomoč vozniku na avtocesti (HIGHWAY DRIVER ASSIST)

Sistem lahko nadzoruje vozilo z nastavljeno hitrostjo, razdaljo med vozili in znotraj voznega pasu. Sistem za pomoč vozniku na avtocesti predstavlja prvi korak k avtonomni vožnji, saj avtomobilu omogoča upravljanje lastnih funkcij hitrosti, poti in položaja na voznem pasu. Združuje prilagodljivi/ aktivni tempomat s funkcijo Stop & Go, kar omogoča, da se avtomobil samodejno zaustavi in znova zažene na podlagi premikanja avtomobila pred njim (5).

Slika št. 10 prikazuje sistem nadzora za pomoč vozniku na avtocesti, kot na primer: pozicija vozila, aktivnost tempomata, idr.

Slika št. 10. Sistem za pomoč vozniku na avtocesti (5)

9. Zaključek

Asistenčni sistemi nudijo pomoč pri upravljanju vozil in morebitnih neljubih situacij v prometu. Kljub že znanim tehničnim rešitvam za avtonomno vožnjo vozil, bo verjetno minilo nekaj časa, da bo prišlo do masovne uporabe asistenčnih sistemov. Zato bodimo vestni pri upravljanju vozil in upoštevajmo načela defenzivne vožnje. Tehnične rešitve naj nam bodo v pomoč, mi pa s polno zavestjo upravljajmo vozilo.

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(3) Harl B., Kegl, M. Prevozna sredstva cestnega prometa. Elektronski vir. Konzorcij višjih strokovnih šol za izvedbo projekta IMPLETUM. 2008.

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Sebastjan Andrejc

mag. Roman Krajnc

DRIVER-ASSISTANCE SYSTEMS IN ROAD SAFETY

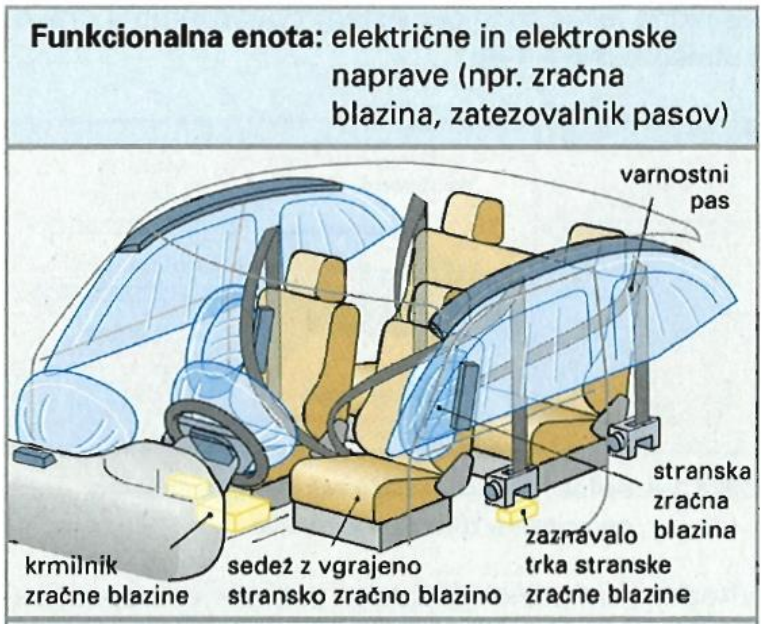
The purpose of advanced systems is to help the driver to prevent a possible traffic accident. Despite the use of technical equipment, the driver is still responsible for his behaviour and driving on the road. This means that the driver must not exploit the systems at the expense of less attention to vehicle management and traffic monitoring. Raising the level of road safety requires designers and vehicle manufacturers to follow the guidelines for achieving maximum safety for all road users. We can say that there are almost no technical-technological obstacles to achieving this. So just keep going, safely in traffic. The article describes some basic assistance devices.

1.Decades ago

This was a period when the technology was in full development. The vehicles were of "simple construction". Some vehicles did not have a built-in power brake booster as they were without a servo wheel and ABS system. Remember the beginnings of installing seat belts. The seat belt is a fundamental part of the car's safety equipment - without it, all other passive safety devices lose their significance (1). The seat belt has not been an integral part of cars from the very beginning - its history is more than 60 years long. The first seat belts were installed in cars, following the example of belts in airplanes, towards the end of the 1950s, but only as an accessory. The year 1959 is marked as the beginning of the installation of three-point seat belts in cars, when Swedish Volvo began to install a three-point seat belt as standard in its 121 Amazon and PV544 models, which was attached to the car's body and kept the driver's body in the seat in the event of a collision. The inventor of this seat belt was Nils Bohlin, who came to Volvo in 1958 with experiences in developing seats in airplanes that could be catapulted out of an airplane in the event of serious danger.
That's how it used to be. Today, the situation is completely different. All road users are aware of the importance of safety. Thus, there is already a lot of competition from vehicle manufacturers competing over

who will offer better and more equipment. Photo no. 3 shows an advanced airbag functional unit and seat belt.

Photo no. 1: functional unit (2)



The fact is that modern systems are an integral part of all motor vehicles. Every traffic participant or user of a traffic service wants to have a system that meets their needs and expectations. Ensuring greater safety is possible by encouraging road users to behave more responsibly, comply with regulations and raise awareness of the importance of road safety, and by providing safer vehicles and road infrastructure. The latter they can and must be implemented by designers, manufacturers, vehicle services, designers and infrastructure contractors.

2.Vehicle load

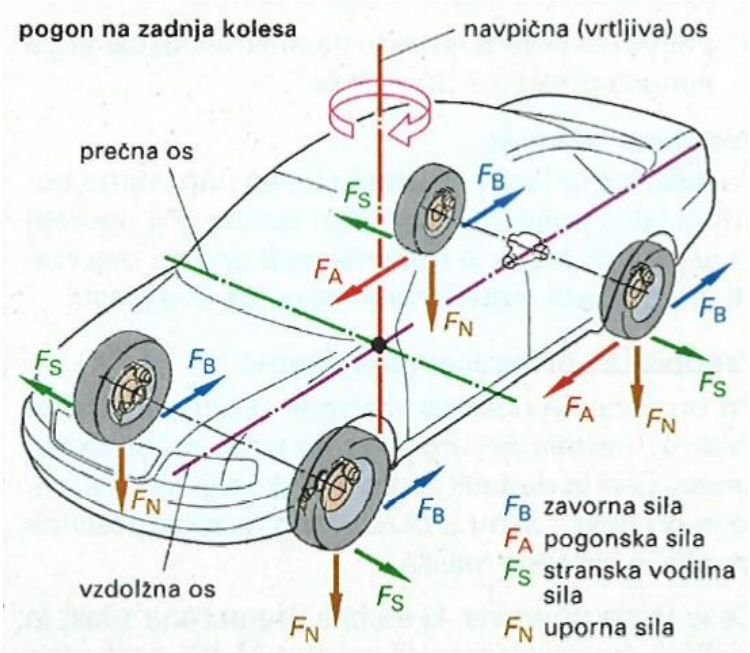
According to the Motor Vehicles Act (4), products are placed on the market and put into service if they comply with the technical requirements concerning safety, life and health protection, environmental protection and other requirements related to vehicles, if their compliance with the prescribed technical requirements and technical condition and identity have been confirmed in the prescribed procedure, if they are marked in accordance with the regulations governing the conformity assessment of vehicles. This is a condition that we can expect the vehicles to be constructed according to certain technical conditions. Vehicles are affected by various forces and resistances. The load on individual wheels is an important piece of information for the vehicle's traction and braking ability. The wheel load depends on (3):

- positions of the vehicle's centre of gravity,
- road slope,
- air resistance,

- inertia forces,
- acceleration or deceleration ...

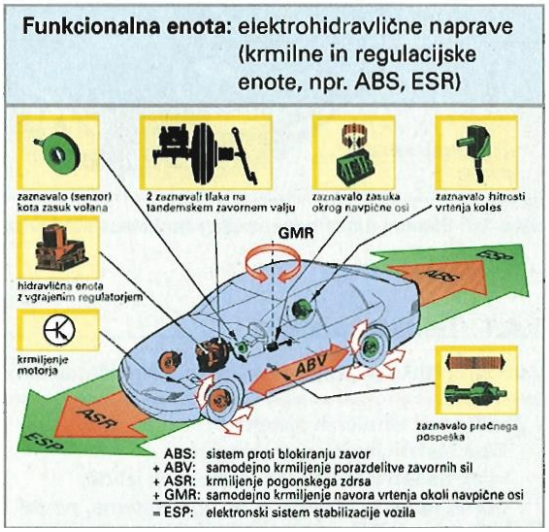
Traffic resistances are forces that resist the movement of means of transport. They are caused by transport vehicles themselves or due to the driving route. If we want the vehicle to move, we have to overcome all resistances. The resistors in vehicles are (3):
- rolling resistance,
- air resistance,
- resistance in overcoming the slope,
- resistance when accelerating or braking the vehicle.

Photo no. 2: Forces and axles on the vehicle (2)



The presence of larger and faster vehicles is reflected in the driving dynamics. Thus, there is no doubt that compared to the past, it is very important today to construct techniques and technologies in the vehicle that provide support to the driver. Photo no. 2 shows the ABS and ESR control unit with appropriate technical support.

Photo no. 3: Functional unit (2)



In the continuation of the article, we will describe some elements - functional units that have significantly raised the level of safe vehicle management. In this article, we will limit ourselves to certain elements of assistance systems for passenger cars. We will not discuss vehicle autonomy, but it is an opportunity for further research.

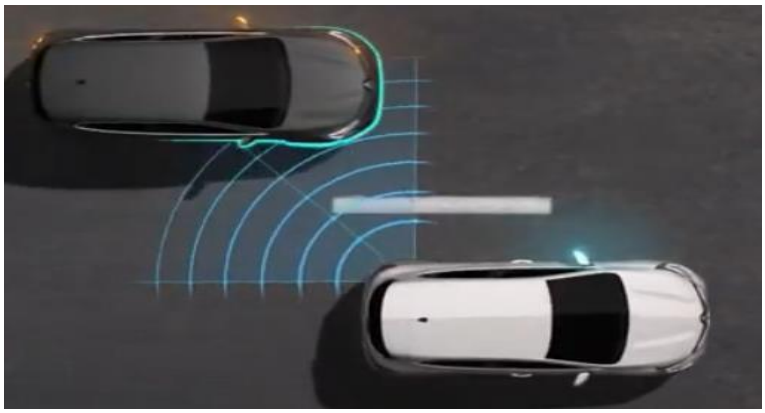
3.Blind-spot monitoring

A blind spot is a field that the driver cannot see when looking out the window or in a normal mirror. Due to the blind spot, there are many car and truck accidents when drivers do not see motorcyclists, cyclists or pedestrians, especially when turning right. The blind spot monitoring system displays the presence of the vehicle in the blind spot by displaying the symbol in the exterior mirrors. A system that works on the same principle as reversing sensors is important for safety, especially in city driving. The system works in conjunction with an inadvertent lane departure warning: in addition to a warning light illuminating in the rear-view mirror on the corresponding side, the driver senses a correction in the direction of travel if he crosses the floor line with the direction indicator on. The purpose of the repair is to help the driver avoid a collision (5). Photo 4 shows a warning of approaching the vehicle in a blind spot.

Photo no. 4: Warning of approaching the vehicle in a blind spot (5)

Photo no. 5 shows a blind angle monitoring sensor operation.

Photo no. 5: Blind angle monitoring sensor operation (6)



4.Lane departure warning

An inadvertent lane departure warning is a system which, with the help of a camera for detecting a broken or continuous line, detects inadvertent driving over a longitudinal floor marking, which separates the lanes. For safe driving, the camera analyses the image. If the driver's attention is lost and the vehicle is moving at a speed above 80 km/h, it triggers a visual and audible warning when deviating from the direction. Between 65 km/h and 180 km/h, the active lane departure warning also triggers a correction of the direction of travel: as soon as the system detects the danger of accidental driving over the detected dividing floor line, the steering wheel gradually turns in the other direction to keep the vehicle on current lane. If the driver wishes to maintain the direction of movement of the vehicle, he can prevent the correction by holding the steering wheel firmly (for example, while avoiding an obstacle). The correction is stopped as soon as the driver switches on the turn signals (6). Photo no. 6 shows a system for maintaining the vehicle's position in the lane.

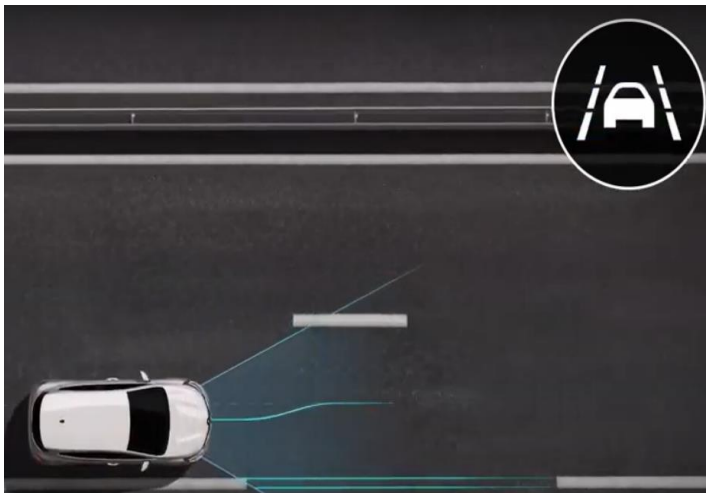
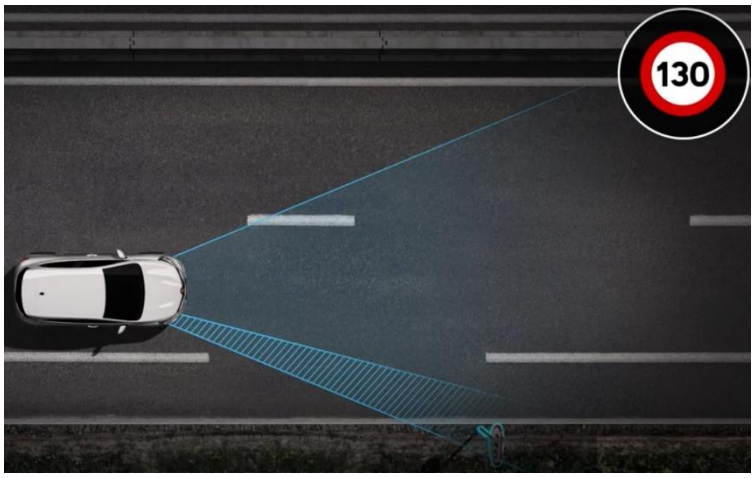


Photo no. 6: System for maintaining the vehicle's position in the lane (6)

5.Speeding warning with traffic-sign recognition system

We are constantly confronted with the disadvantage that we do not see or perceive certain situations or traffic signs. Of course, this is not good, as not only do we violate the legal provisions for safe driving, but it can also result in a car accident.
While driving, you are informed of speed limits and warned if you exceed the speed limit. The camera-equipped system collects, analyses and compares data on traffic signs with information on maps and informs you via the dashboard and projection screen (depending on the vehicle and version). For greater efficiency, set the speed limiter to the maximum detected value (6). Photo no. 7 shows the reading system or recognizing the content of a traffic sign.

Photo no. 7: Warning speeding with a traffic sign recognition system (6)



6.Active seat belts

The active seat belts of the driver and front passenger are equipped with a motor that automatically tightens the seat belt in the event of danger, thus achieving maximum protection. At speeds above 10 km/h, they become slightly tense, forcing the driver and front passenger to sit properly. Many injuries can be avoided if passengers sit properly in their seats. Unfortunately, this system is not yet installed in the rear seats (5). Photo no. 8 shows the action of the tensile force on the seat belt.

Photo no. 8: Active seat belt (5)

7.Emergency braking system (Active Safety Break)

Active Safety Break is an emergency braking system designed to prevent a collision at low speeds. Reduces the risk of a frontal collision via automatic braking instead of the driver when the speed exceeds 5 km/h. If the system detects a collision hazard, it sends a clear warning to the driver. If there is no signal response, the system brakes automatically. The system detects vehicles driving in the same direction or at a standstill, and the system also detects pedestrians on the roadway (bicycles, motorcycles, animals and objects on the roadway are not detected by the system). The Active Safety Brake system operates under the following conditions:
- vehicle speed between 5 km/h and 140 km/h when a moving vehicle is detected;
- the vehicle speed does not exceed 80 km/h when a stationary vehicle is detected;
- the vehicle speed must not exceed 60 km/h when a pedestrian is detected (5).

Photo no. 9 shows an automatic braking system based on the detection of uncontrolled approach to an obstacle - vehicles, pedestrians, etc.

Photo no. 9: Emergency braking system (5)

8.Motorway driving assistance system (HIGHWAY DRIVING ASSIST)

The system can control the vehicle at the set speed, distance between vehicles and within the lane. The motorway driver assistance system is the first step towards autonomous driving, as it allows the car to control its own speed, route and lane position functions. It combines adaptive / active cruise control with the Stop & Go function, which allows the car to stop automatically and restart based on the movement of the car in front of it (5).

Photo no. 10 shows a control system to assist the driver on the motorway, such as: vehicle position, cruise control activity, etc.

Photo no. 10. Motorway driving assistance system (5)

9.Conclusion

Assistance systems offer assistance in driving and potentially unpleasant traffic situations. Despite the already known technical solutions for autonomous driving, it will probably take some time for the assistance systems to be widely used. Therefore, let us be diligent in driving vehicles and follow the principles of defensive driving. Technical solutions should help us, and we should operate the vehicle with full awareness.

10.Literature

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“СООБРАЌАЈНАТА БЕЗБЕДНОСТ НА УЧЕНИЦИТЕ ОКОЛУ УЧИЛИШТАТА”

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Герамитчиоска Валенетина

Прилеп, Јули, 2020

Абстракт: Главната цел во овој труд е да се нагласи потребата од подигнување на безбедноста на сообраќајот и сообраќајната инфраструктура како и обележувањето околу училишните средини.Имено забележително е дека нецелосно е сигурна безбедноста во сообраќајот на учениците околу училишната средина со што се доведува во прашање нивната сигурност при доаѓање, заминување од училиште како и за време на престојот во училиштето и користењето на слободното време пред училишната зграда. Со овој наш труд сметаме дека ќе придонесеме кон подигање на свеста на сите релевантни фактори кои на било кој начин можат да се препознаат како главни во обезбедувањето на безбедноста во сообраќајот како и однесувањето на самите ученици како учесници во сообраќајот пред училишните згради.Акцентот ќе се стави на обележувањето , на обезбедувањето сигурност на учениците, потребнитse информации кои треба да ги имаат учениците за нивната безбедност во сообраќајот како и начините на кој начин че ги добиваат истите.Цениме дека доколку сите компетентни ја увидат и утврдат потребата од обезбедување на поголема безбедност на сообраќајната инфраструктура како и колку повеќе информирани ученици толку повеќе ќе очекуваме стапката на направени сообраќајни истапи, грешки како и грешки со фатални исходи ќе биде сведен на минимум. Ова нема да претставува наш личен успех или придобивка туку тоа ќе е едновремено придобивка за целокупната заедница. За да се се обезбеди здрава , безбедна сообраќајна инфраструктура цениме дека најнапред треба да се детектираат пропустите во истата во сите училишта кои постојат во градот без разлика дали станува збор за основни или средни училишта.

Клучни зборови: Безбедноста во сообраќајот на учениците околу училиштата, сообраќајна инфраструктура, учесници во сообраќајот, формално, неформално образование..

В О В Е Д

На ниво на нашата Општина постојат вкупно 7 основни и 5 средни училишта во кои вкупно наставата ја следат некаде околу 8000 ученици. Повеќето од нив доаѓаат до училиштата по не обезбедени патеки т.е. необележани, други пак доаѓаат со организиран превоз кој неретко ги остава на неколку метри оддалеченост од училиштето, а се повеќе е евидентно доаѓањето на училиште со сопствен превоз, посебно кај младите кои се стекнале со право на возачка дозвола и управување на автомобил или мотоцикл, не помал е и бројот на учениците кои го користат велосипедот како превозно средство за доаѓање на училиште. Во сите горенаведени случаи низ изминатите години се забележуваат голем број неправилности како и несреќи во користењето на превозните средства или пак ако се најдат во улога на пешаци. Тоа е резултат пред се на лошата сообраќајна инфраструктура, недоволната присутност на униформирани лица (сообраќајци) на места кои се со висок ризик за предизвикување на некаква сообраќајна незгода. Не помалку од значење е и ниската сообраќајна свест кај младите, која можеби недоволно ја стекнале низ формалното или неформалното образование. Иако низ годините евидентна е заложбата на централните власти преку рекламни пораки и мал број на едукативни емисии да се зголеми сообраќајната свест сепак се покажува како недоволно во напорот да се обезбеди безбедноста на учениците во сообраќајаот.

Главна цел на проектот е да се подобри безбедноста и пристапноста на учениците до училиштата

Специфични цели:

- Да се поттикни и подигни свеста на учесниците во сообраќајот за важноста на нивната улога при учеството во сообраќајот,
- Да се понудат конкретни сообраќајно – регулативни мерки и инвестициско – инфраструктурни интервенции што ќе доведат до решавање на идентификувани проблеми и да се понуди препорачано , канализирани движења на учесниците во сообраќајот во зоните на училиштата,
- Да се усогласат термините и активностите на комерцијалните објекти лоцирани во непосредна близина на училиштето согласно приоритетите за безбедно движење на учениците до училиштата.

2.Улогата на училиштето во обезбедување на сообраќајна сигурност на учениците

Како еден од најповиканите фактори кои можат да придонесат во обезбедувањето на сообраќајна сигурност и безбедност на учениците се образовните институции. Кога ги споменуваме нив не целиме кон тоа дека нивната улога во давањето на ваква поддршка лежи само во организирањето на наставата т.е. реализација на наставни содржини во кои се третира баш оваа проблематика. Секако дека ова е неизоставен и многу суштествен момент, но кога зборуваме за безбедност на учениците

тука мислиме и на ангажманот на менаџерскиот тим во обезбедувањето на сигурност во сообраќајната инфраструктура пред училиштето. Имено, секое училиште треба да има менаџерски тим кој ќе има разбирање за тоа дека треба да направи одреден план кој треба да го поднесе до општинските власти преку кој ќе изнуди сигурно доаѓање и заминување на учениците од и до училиштето како и времето поминато пред училиштето за време на големите одмори.

Евидентно е дека сеуште пред одредени училишта не се поставени потребните сигнализации а уште помалку инфраструктурни решенија на улицата која се најдува пред училиштето во смисла на обезбедување на хоризонтална и вертикална сигнализација. Немањето на вакви безбедни обележја било причина за доведување на сообраќајни незгоди дури некогаш и со фатални последици. Затоа, час поскоро секое училиште треба да изготви таков план со кој што ќе се зголеми безбедноста, истиот ќе се презентира пред поширокатa заедница, пред родителите, наставниот кадар а најмногу пред учениците кои учат во одреденото училиште. Важноста од запознавање на сите гореспоменати е со цел подигање на свеста и давање одредени напатствија како да се однесуваат сите чинители во сообраќајот а посебно како да се заштитат учениците во сообраќајот пред одредено училиште. Она што сметаме дека е најнеопходно е поставувањето на вертикална и хоризонтална сигнализација на ударни места кои што пред се ќе сигнализираат дека на одредена оддалеченост т.е. во близина има училиште. Исто така треба добро да се осмисли поставеноста на легнатите полицајци на улицата која е пристапна до училиштето од сите влезови кои што водат до училиштето. Пожелно е во моментите кога учениците доаѓаат и го напуштаат училиштето да има униформирано лице или пак волонтери кои ќе се грижат за безбедното доаѓање и заминување на учениците до и од училиштето. Вака изготвениот план треба да биде поднесен пред стручен тим кој ќе биде составен од членови од локалната самоуправа како и од униформирани лица од полициската станица. Стручното познавање е од огромно значење во изработката и имплементацијата на добро осмислен план кој што има главна цел да ја обезбеди сигурноста на учениците во сообраќајот.

Од непомалку значење е и она што погоре го напоменавме а тоа е обезбедување на информации на учениците низ формалното и неформалното образование за тоа како да се однесуваат во сообраќајот и што самите тие можат да преземат за што повеќе да се заштитат себеси но и останатите чинители во сообраќајот.

Сообраќајното бразование во нашиот образовен систем се воведува уште од предшколска возраст и низ наставни содржни се третира во продолжение во основното образование но многу малку или така речи воопшто не е застапено во средното образвание. Она што е се забележува е дека теоретските знаења се можеби солидни но истите непоткрепени со практични покази остануваат само на “голи информации” кои учениците неможат да ги апсловираат доволно и неможат да создатат јасна слика. Неопходно е истите да бидат поткрепени со практични покази т.е. често извлекување на учениците од училниците и водење на улиците со цел она што го учат во училницата и да го доживеат. На вој начин ќе се поддржи и еден од главните дидактички принципи на нагледност во наставата со кој во голема мера се овозможува олеснување во стекнувањето на теоретските знаења преку нагледност во наставата и практични примери. Од голема помош е вклучувањето на униформирано лице кое на начин кој соодветсвува на интелектуалниот развој на учениците ќе им ги пообјасни или доближи основните правила и начела за движење и днесување во сообраќајот , посебно во округот на нивното училиште.

Од не помало значење е и неформалното образование, т.е. она кое не е внесено во наставните содржини туку училиштето го обезбедува преку др начини како организирање на едукативни работилници со наменски содржини за ученици, родители , наставници, организирање на полигон, пригодни предавања одстрана на компетентни униформирани лица, вклученост на учениците во Сообраќајна единица и нивно активно ангажирање на терен, пригодни предавања од страна на Граѓнскиот сектор, проекција на кратки филмови со едукативна содржина, приказ на примери од настанати сообраќајни незгоди и сл.

3.Улогата на родителите во подигање на сообраќајната свест кај сопствените деца и можни начини на заштита

Во намерата да го пишуваме овој труд се повикавме и на искуствата од странските држави каде можеби стапката незгоди на учениците во сообраќајот во околината на училиштата е поголема поради поголемиот број на ученици како и пофрекфентниот сообраќај. Одтука во тие држави целеле дека многу повеќе во напорот да се обезбеди поголема сигурност на учениците во сообраќајаот околу училиштата е вклучувањето на родителите во логистиката на сопствените деца при вклучување во сообраќај и нивното однесување во истиот.Сосема е очекувано дека однесувањето на децата да биде сосема непредвидливо , така што посебно на помалите деца им е потребен надзор.Почитувањето на сообраќајните знаци и правила каде има вклученост на пешаци, велосипеди, автомобили посебно околу училиштата е од особено значење.Ова ја наметнува потребата од поголема ангажираност и вклученост на родителите во воведувањето на сопстевените деца во сообраќајот и запознавањето на елементарната сообраќајна култура. Имено родителите треба да:

- Ја изберат најсигурната патека која води до училиштето пред да се осамосталат истите да ја користат во иднина;
- Да ги научат децата никогаш да не преминуваат меѓу паркирани автомобили;
- Пред да преминат одреден пат или улица внимателно да проверат за присутноста на автомобили, велосипеди на патот и доколку е можно да остваруваат контакт со очи со возачите со цел да достават до знаење дека се пристуни како пешаци;
- Да им укажат дека додека се преминува одредена улица секогаш вниманието да и е фокусирано на безбеден премин без дистрација;
- Доколку децата за да пристигнат до училиштето короистат велосипед задолжително е носење на заштитна опрема;
- Пред да се вклучат во сообраќајот и пред да тргнат на училиште обавезно да ги научат на препознавање на основните сообраќајни знаци , како што се знкаот Стоп, црвената сигнализација на семафорот;
- Да им предочат за тоа дека треба да бидат исклучително внимателни за скриените патеки од кои ненадејно може да излезе автомобил, мотор или велосипе;
- Секогаш при одење или враќање од училиште да ги користат тротоарите доколу постојат;

- Пожелно е родителите да им обезбедат безбедносна флуоресцентна опрема која можеби најповеќе чќе им треба во вечерните часови кога си доаѓаат од училиште со цел да бидат од поголема оддалеченост препознатливи во сообраќајот;

4. Значењето и улогата на возачите во сообраќајот

Секако дека еден од главните услови да се обезбеди сигурноста во сообраќајот е улогата на возачите, нивното однесување и присебност посебно во зони каде што има училишта и ученици.Честопати се случува поради нивната несовесност да настанат ситуации, сообраќајни незгоди дури и со потешки последици, оттука излегува потреба дека и тие треба да се крајно совесни и претпазливи посебно во зоните каде има училишта.Она што е најважно а се однесува натоа што тие треба да го имаат предвид во сообраќајот, во зоните на училиштата е следното:

- Секогаш кога пешакот има предимство на премин треба да го пропуштат;
- Секаде каде што нема сообраќајни знаци да подзабави или пак да запри за да ги пропушти пешаците;
- Секогаш да застани кога се приближува до училишен автобус кој врши пренос на ученици до училиштето;
- Да ги почитува правилата за ограничување и секогаш да ја прилагоди брзината кога наидува во зони каде има училшта;
- Да се избегнува двојно паркирање и секогаш доколку забележат дека од автомобил излегува ученик истиот да го остават безбедно да излези од автомобилот;
- Подеднакво да се внимава и на учениците кои користат велосипед во сообраќајот за нивното движење по улица, посебно кога нема велосипедски патеки;
- Посебно да се внимава во движењето во времето на големите одмори кога учениците масовно излегуваат пред училиштето.
- Да избегнуваат опасни маневри како нагло свртување;
- Да се избегнува паркирање непосредно пред училиштето освен ако истото е од голема неопходност;
- Да се ослободат пристапите за влез и излез од училиштето.

5.Прибирање , анализа на податоци и идентификација на проблемите

Анализа на постојната состојба и локација на едно основно училиште коешто се најдаува во централното градско подрачје и е најкритично по по однос на движењето и пристапот на ученицте до него. Станува збор за ООУ “Кире Гаврилоски –Јане “ ,од Прилеп кое е лоцирано на улиците “Јоска Јорданоски” и “Кеј 1ви Мај”.

По однос на локацијата на училиштето се определивме да го земем него како за пример па врз основа на тоа учениците од Сообраќајната единица при нашето училиште СОУ “Ристе Ристески-Ричко” со нивните одговорни наставници од сообраќајната струка во временски период од 1 месец вршеа набљудување на теренот и прибирање на податоци.

Прибирањето на податоците еизвршено во месец Ноември 2019 при што е користен метод на рачно прибирање на податоците а снимањето е извршено според видот на возило, велосипед и пешаци, како и приодот и насоките на движење.

При вршењето на набљудувањето на влезот и излезот на училиштето се забележа голема конфликтност помеѓу за достава , пешаци и останати возила.На оовој начин е намалена пристапноста , безбедноста поради преплетувањето на токовите на движење, полукружни свртувања и слично.

6.Анализа на теоријата и добри практики за проектирање на безбедни рути до училиштата

Се смета дека дека со правилен избор на иншенерски елементи и сообраќајни решенија може да се подобри движењето во училишните зони каде ќе се обезбеди средина за сигурна средина за учесниците во сообраќајот.Кон ова најповеќе мислиме на следните решенија:

- Инженерски елементи и третмани за пешаци
- Инженерски елементи и третмани за велосипедисти
- Мерки за смирување на сообраќајот

Кон првото решение цениме дека треба да има хоризонтална сигнализација на сообраќајниците , приодот на патеките за пешаци и велосипедисти и истите да бидат изработени од ладан пластика или термопластика.

Вертикална сигнализација и другите сигнали со кои ќе се предушредат учесниците во сообраќајот за локацијата на училиштето, пешачки премин, знаци за пешаци, велосипедисти и истите да бидат поставени на флуоресцентна жолто-зелена позадина

Дпбро би било доколку се постави пешачки премин во различна текстура како една од мерките за смирување на сообраќајот во близина на училиштата со таканаречено поставување на 3 D пешачки премин “пијано”.

Кон ова би било пожелно да се постави и осветлен пешачки премин (особено значаен за во вечерните часови).

При набљудувањето е оценето дека можат да се превземат дополнителни инженерски решенија и тоа во насока на креирање на пристапни улици, пократки патеки и алтернативни рути до училиштето.

По однос на тротоарите цениме дека истите се доволно широки и безбедни, берем оние неколку кои се најдуваат во близина на училиштата.

Кон второто решение т.е. за инженерските елементи и третмани за велосипедистите потребно е да имаат соодветно означено и безбедно место за паркирање на велосипедот со различни изведби. Неопходно е велосипедските патеки кои водат до училиштата да бидат безбедни што значи истите да се добро обележани со соодветна сигнализација и истите да се издвоени од моторниот сообраќај.

Кон третото решение или мерките за смирување на сообраќајот со која на возачите им се дава визуелна перцепција кога влегуваат во зоната на смирено подрачје а при тоа се вклучени вибрациски направи, знаци со променлива порака за брзината на движење и сл.Од големо значење за возачите како учесници во сообраќајот е тие да забавуваат како резултат на извршените интервенции на сообраќајниците (стеснет профил на сообраќајницата, ленти за паркирање).

7.Предлози,препораки и одговорности за реализација на активностите

1.Фоормирање на координативно тело составено од претставници од училиштето, совет на родители, Општината и претставници на совет за безбедност и СВР за координација на активностите и реаллизација на предлог проект доколку има изготвено одредено училиште а се однесубва на безбедноста на учесниците во сообраќајот во зоните на училиштата.

2.Одржување обуки од страна на Советот за безбедност на сообраќајот во соработка со одделот за превенција при СВР со цел подигање на свеста за безбедноста наменета за учениците како и учесниците во сообраќајот.

3. Обележување на униформите на учениците , посебно на основошколците со флуоресцентна лепенка за да се зголеми нивнта забележливост.

4. Изработка на промотивни материјали за унапредување на безбедноста и подигнување на нивото на свест кај учесниците во сообраќајот.

5.Изработка на флаери со едукативни содржини и нивно поделување меѓу учесниците во сообраќајот од страна од учениците и наставниците.

6.Поставување на постери на големи билборди непосредно до училиштата на видливи места со моќни пораки.

7.Изработка на едукативни видео клипови со вклучување на познати чичности ккао и учрници и нивно медиумско промовирање и на социјалните мрежи.

8.Организирање и спроведување на едукативни работилници со пригодни предавачи, компетентни, од делот на превенција во сообраќајот.

9.Извршување на инфраструктурните интервенции за имплементирање и примена на основниот сообраќаен проект.

10. Промовирање на концептот и запознавање на клучните учесници со правилата на однесување и начинот на учество во сообраќајот.

8. Очекувани резултати

Врз основа на превземените активности априори очекуваме да се подобри целокупната состојба по однос на безбедноста на учесниците во сообраќајот посебно во зоната на училиштата како и подигање на свеста и сообраќајната култура на сите учесници во сообраќојот.

Имајќи ги во предвид мерките кои се превзеле се очекуваат следните резултати:

- **Формирано координативно тело** кое треба да ги опфати претставниците од училиштето, Советот на родители, Локалната самоуправа како и претсатавниците од Советот на безбедност при СВР.
- **Реализирани најмалку 2 обуки,** истите да се спроведат од страна на Советот за безбедност на сообраќајот на патиштатав во соработка со одделот за превенција при СВР.
- **Обележани униформи на учениците со флуоресцентни лепенки**
- **Изработени пригодни промотивни материјалисо едукативни содржини**, наменети за учесниците во сообраќајот.
- **Изработени флаери** со кратка наменлива содржина и нивна дистрибуција меѓу учесниците во сообраќајот
- **Изработени и поставени постери, избор на добра , видлава локација при нивното поставување**
- **Изработени 3 видео клипови со познати личности и ученици** и нивно медумско прикажување како и споделување на социјалните мрежи.
- **Реализирани едукативни работилници** со вклучени компетентни лица од секторот за безбедност во сообраќајот
- **Реализирани инфраструктурни интервенции** за имплементирање на сообраќајниот проект и
- **Промовиран концептот** пред поширокатa локална заедница за правила на однесување и начин на учество во сообраќајот.

9.Заклучни согледувања

Неомнено дека од огромна важност и значење е обезбезбедувањето на сигурна сообраќајна средина за сите учесници во сообраќајот, посебно на учениците околу училиштата па отука и заложбите на сите фактори во сообраќајот а посебно на училишниот менаџмент.

Ова произлегува од јасно нагласениот проблем на сообраќајното задушување пред влезот, т.е излезот на училиштето.Несовесното однесување на дел од учесниците во сообраќајот доведува до несакани последици пред се порди неправилно паркарињe на возилата, блокирање на пешачките премини како и непропоисните полукружни свртувања на возилата и преплетување на токовите.Голем проблем во целата ситуација се издвојуваат и напостоењето на препорачани канализирани патеки за движење на учесниците во сообраќајот во зоните на училиштата.Уште повече ваквата ситуација ја отежнуваат и постоењето на комерцијални објекти во близина на училиштата што генерираат и акумулираат зголемена фрекфенција на возила и пешаци.

За да се осигура безбедноста на сообраќајот во зоните на училиштата неопходно е превземање на итни мерки како и зголемена свест на сите учесници во сообраќајаот. Само на ваков начин може да се осигура и подобри безбедноста на учесниците во сообраќајот, посебно на учениците.

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"TRAFFIC SAFETY OF STUDENTS AROUND THE SCHOOL"

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Abstract: The main goal of this paper is to emphasize the need to increase traffic safety and traffic infrastructure as well as marking around school environments. Namely, it is noteworthy that the safety of students in traffic around the school environment is incompletely questionable safety on arrival, leaving school as well as during the stay at the school and the use of free time in front of the school building. With this paper we believe that we will contribute to raising awareness of all relevant factors that in any way can be recognized as key in ensuring traffic safety and the behavior of students themselves as participants in traffic in front of school buildings. The emphasis will be marking, ensuring the safety of students, the necessary information that students should have about their traffic safety as well as the ways in which they will receive them. We appreciate that if all competent see and determine the need to ensure greater safety of traffic infrastructure as well as the more informed students the more we expect the rate of traffic jams, errors and errors with fatal outcomes will be reduced to a minimum. This will not be our personal success or benefit but it will be a benefit for the whole community at the same time. In order to ensure a healthy, safe traffic infrastructure, we appreciate that first of all, the flaws in it should be detected in all schools that exist in the city, regardless of whether they are primary or secondary schools.

Keywords: Student traffic safety around schools, traffic infrastructure, traffic participants, formal, non-formal education.

1. Intudiction

At the level of our Municipality there are a total of 7 primary and 5 secondary schools in which a total of about 8000 students attend classes. Most of them come to schools on unsecured paths. unmarked, others come with organized transport that often leaves them a few meters away from the school, and it is increasingly evident coming to school with their own transport, especially among young people who have acquired the right to a driver's license and drive a car or motorcycle, no The number of students who use the bicycle as a means of transportation to school is also lower. In all the above cases, over the past years, a number of irregularities have been noticed as well as accidents in the use of vehicles or if they find themselves in the role of pedestrians. This is primarily a result of the poor traffic infrastructure, the insufficient presence of uniformed persons (drivers) in places that are at high risk of causing a traffic accident. No less important is the low traffic awareness among young people, which they may not have sufficiently acquired through formal or non-formal education. Although over the years the commitment of the central authorities through advertising messages and a small number of educational shows to increase traffic awareness is evident, it still proves to be insufficient in the effort to ensure the safety of students in traffic.

The main goal of the project is to improve the safety and accessibility of students to schools

Specific objectives:

• To encourage and raise the awareness of traffic participants about the importance of their role in traffic participation,

• To offer specific traffic - regulatory measures and investment - infrastructure interventions that will lead to solving identified problems and to offer recommended, channeled movements of traffic participants in school areas,

• To harmonize the terms and activities of the commercial facilities located in the immediate vicinity of the school in accordance with the priorities for safe movement of students to the schools.

2. The role of the school in providing traffic safety to students

As one of the most important factors that can contribute to ensuring traffic safety and security of students are educational institutions. When we mention them, we do not mean that their role in providing such support lies only in the organization of teaching, ie. realization of teaching contents in which this issue is treated. Of course, this is an indispensable and very essential moment, but when we talk about the safety of students, we also mean the engagement of the management team in ensuring safety in the traffic infrastructure in front of the school. Namely, every school should have a management team that will have an understanding that it should make a certain plan that it should submit to the municipal authorities through which it will ensure the safe arrival and departure of students to and from school as well as the time spent in front of the school during the big holidays.

It is evident that the necessary signalizations have not been placed in front of certain schools yet, much less the infrastructural solutions on the street in front of the school in terms of providing horizontal and vertical signalization. The lack of such safe signs was the reason for leading traffic accidents even sometimes with fatal consequences. Therefore, as soon as possible, each school should prepare a plan that will increase safety, it will be presented to the wider community, parents, teachers and most of all to students who study in the school. The importance of getting to know all of the above is in order to raise awareness and give certain instructions on how to behave all stakeholders in traffic and especially how to protect students in traffic in front of a particular school. What we consider to be the most necessary is the placement of vertical and horizontal signalization at impact points which will primarily signal that at a certain distance, ie. there is a school nearby. The placement of lying policemen on the street that is accessible to the school from all entrances leading to the school should also be well thought out. It is desirable in the moments when students come and leave the school to have a uniformed person or volunteers who will take care of the safe arrival and departure of students to and from school. The plan prepared in this way should be submitted to an expert team that will be composed of members of the local self-government as well as uniformed persons from the police station. Professional knowledge is of great importance in the development and implementation of a well-thought-out plan which has the main purpose of ensuring the safety of students in traffic.

Of no less importance is what we have mentioned above and that is providing information to students through formal and non-formal education on how to behave in traffic and what they can do to protect themselves and other stakeholders in traffic.

Traffic education in our educational system is introduced from pre-school age and through teaching content is treated in continuation in primary education but very little or so is not present at all in secondary education. What is noticeable is that the theoretical knowledge may be solid but the same unsupported by practical

evidence remain only "naked information" that students can not absorb enough and can not create a clear picture. It is necessary to support them with practical evidence, ie. often pulling students out of classrooms and guiding them through the streets in order to experience what they are learning in the classroom. In this way, one of the main didactic principles of teaching in teaching will be supported, which greatly facilitates the acquisition of theoretical knowledge through teaching in teaching and practical examples. It is of great help to include a uniformed person who in a way that corresponds to the intellectual development will explain or bring closer to the students the basic rules and principles for movement and behavior in traffic, especially in the district of their school.

Non-formal education is of no less importance, ie. what is not included in the curriculum but the school provides it through other ways such as organizing educational workshops with dedicated content for students, parents, teachers, organizing a training ground, appropriate lectures by competent uniformed persons, involvement of students in the Traffic Unit and their active engagement in the field, appropriate lectures by the Civil Sector, screening of short films with educational content, showing examples of traffic accidents, etc.

3. The role of parents in raising traffic awareness among their own children and possible ways of protection

In the intention to write this paper, we also referred to the experiences from foreign countries where perhaps the rate of accidents of students in traffic around schools is higher due to the larger number of students and more frequent traffic. Hence, in those countries, the goal was to involve parents in the logistics of their own children in traffic and their behavior in the effort to ensure greater safety of students in traffic around schools. It is quite expected that the behavior of children to be completely unpredictability, so that younger children in particular need supervision. Observance of traffic signs and rules involving pedestrians, bicycles, cars, especially around schools is of particular importance. This imposes the need for greater involvement and involvement of parents in the introduction of own children in traffic and getting to know the elementary traffic culture. Namely, parents should:

• Choose the safest path that leads to the school before they become independent to use it in the future;

• Teach children never to pass between parked cars;

• Before crossing a road or street, carefully check for the presence of cars, bicycles on the road and, if possible, make eye contact with drivers in order to let them know that they are present as pedestrians;

• To point out to them that when crossing a certain street, their attention should always be focused on safe crossing without distraction;

• If children use bicycles to get to school, it is mandatory to wear protective equipment;

• Before getting involved in traffic and before going to school, be sure to teach them to recognize the basic traffic signs, such as the Stop sign, the red signal at the traffic light;

• Point out to them that they need to be extremely careful about hidden paths from which a car, motorcycle or bicycle can suddenly come out;

• Always use the sidewalks when leaving or returning from school if available;

• It is desirable for parents to provide them with safety fluorescent equipment that they may need most in the evening when they come home from school in order to be recognizable from a greater distance in traffic;

4. The importance and role of drivers in traffic

Of course, one of the main conditions to ensure traffic safety is the role of drivers, their behavior and composure, especially in areas where there are schools and students. It often happens due to their negligence to occur situations, traffic accidents even with more serious consequences, hence It turns out that they should also be extremely conscientious and careful, especially in the areas where there are schools.

• Whenever a pedestrian has the right of way, they should miss it;

• Wherever there are no traffic signs to slow down or stop to miss pedestrians;

• Always stop when approaching a school bus carrying students to school;

• Obey the rules of restraint and always adjust the speed when coming across areas where there are schools;

• Avoid double parking and always if they notice that a student gets out of the car, let him leave the car safely;

• Equally pay attention to students who use bicycles in traffic for their movement on the street, especially when there are no bicycle paths;

• Pay special attention to the movement during the big holidays when students go out in front of the school en masse.

• Avoid dangerous maneuvers such as sudden turns;

• Avoid parking directly in front of the school unless it is of great necessity;

• Free access to and from school.

5. Data collection, analysis and problem identification

Analysis of the current situation and location of a primary school which is located in the downtown area and is the most critical in terms of movement and access of students to it. It is about the primary school "Kire Gavriloski - Jane", from Prilep, which is located on the streets "Joska Jordanoski" and "Kej 1vi Maj".

Regarding the location of the school, we decided to take it as an example, and based on that, the students from the Traffic Unit at our school "Riste Risteski-Ricko" with their responsible teachers in the traffic profession for a period of 1 month observed terrain and data collection.

The data collection was performed in November 2019, using the method of manual data collection and the recording was performed according to the type of vehicle, bicycle and pedestrian, as well as the approach and directions of movement.

During the monitoring of the entrance and exit of the school, a great conflict was noticed between the delivery, pedestrians and other vehicles.

6. Analysis of theory and good practices for designing safe routes to schools

It is believed that with the right choice of engineering elements and traffic solutions can improve the movement in school areas where a safe environment will be provided for traffic participants. Towards this we mostly think of the following solutions:

• Engineering elements and treatments for pedestrians

• Engineering elements and treatments for cyclists

• Traffic calming measures

According to the first solution, we estimate that there should be horizontal signalization of the roads, the approach of the pedestrian and bicycle paths and they should be made of plastic or thermoplastic.

Vertical signalization and other signals that will warn the participants in the traffic about the location of the school, pedestrian crossing, pedestrian signs, cyclists and place them on a fluorescent yellow-green background

It would be good if a pedestrian crossing with a different texture is set up as one of the measures for calming the traffic near the schools by setting up a so-called 3D pedestrian crossing "piano".

To this it would be desirable to place a well-lit pedestrian crossing (especially important in the evening).

During the monitoring, it was assessed that additional engineering solutions can be taken in order to create access streets, shorter paths and alternative routes to the school.

Regarding the sidewalks, we appreciate that they are wide enough and safe enough, at least the few that are located near the schools.

Towards the second solution, ie. for the engineering elements and treatments for the cyclists it is necessary to have a properly marked and safe parking place for the bicycle with different designs. It is necessary for the bicycle paths leading to the schools to be safe, which means that they are well marked with appropriate signalization and that they are separated from the motor traffic.

Towards the third solution or the measures for calming the traffic with which the drivers are given a visual perception when entering the zone of calm area, which includes vibrating devices, signs with variable message for the speed of movement, etc. Of great importance for the drivers as traffic participants is that they have fun as a result of the performed interventions on the roads (narrowed road profile, parking lanes).

7. Proposals, recommendations and responsibilities for realization of the activities

1. Establishment of a coordination body composed of representatives from the school, parents' council, the Municipality and representatives of the safety council and SIA for coordination of activities and realization of a project proposal if a certain school has been prepared and it is related to the safety of traffic participants in the zones of schools.

2. Holding trainings by the Traffic Safety Council in cooperation with the Prevention Department at the SIA in order to raise safety awareness intended for students and traffic participants.

3. Marking the uniforms of students, especially elementary school students with a fluorescent sticker to increase their visibility.

4. Development of promotional materials for improving safety and raising the level of awareness among traffic participants.

5. Making flyers with educational contents and their distribution among the participants in the traffic by the students and the teachers.

6. Placing posters on large billboards next to schools in visible places with powerful messages.

7. Making educational videos with the inclusion of well-known virtues such as excerpts and their media promotion on social networks.

8. Organizing and conducting educational workshops with suitable lecturers, competent, in the field of traffic prevention.

9. Execution of infrastructural interventions for implementation and application of the basic traffic project.

10. Promoting the concept and introducing the key participants to the rules of conduct and the manner of participation in traffic.

8. Expected results

Based on the undertaken activities a priori, we expect to improve the overall situation regarding the safety of traffic participants, especially in the school area, as well as raising awareness and traffic culture of all road users.

Taking into account the measures taken, the following results are expected:

• Established coordination body that should include the representatives of the school, the Parents' Council, the local self-government as well as the representatives of the Security Council of the SIA.

• At least 2 trainings were realized, to be conducted by the Road Traffic Safety Council in cooperation with the Prevention Department at the SIA.

• Marked student uniforms with fluorescent stickers

• Made suitable promotional materials with educational content, intended for traffic participants.

• Made flyers with short intended content and their distribution among the participants in the traffic

• Posters made and placed, selection of good, visible location during their placement

• Made 3 videos with celebrities and students and their media presentation as well as sharing on social networks.

• Implemented educational workshops with the involvement of competent persons from the traffic safety sector

• Realized infrastructural interventions for implementation of the traffic project and

• The concept of rules of conduct and manner of participation in traffic was promoted to the wider local community.

9. Concluding remarks

Undoubtedly, it is of great importance and importance to provide a safe traffic environment for all participants in traffic, especially students around schools, hence the efforts of all factors in traffic and especially school management.

This stems from the clearly emphasized problem of traffic suffocation in front of the entrance, ie the exit of the school. A big problem in the whole situation is the existence of recommended canal paths for the movement of traffic participants in the school areas. This situation is further complicated by the existence of commercial buildings near schools that generate and accumulate increased frequency of vehicles and pedestrians.

In order to ensure the traffic safety in the school zones, it is necessary to take urgent measures as well as increased awareness of all traffic participants. Only in this way can the safety of traffic participants, especially students, be ensured and improved.

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ŠKOLA ZA CESTOVNI PROMET, ZAGREB

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Proširenje pješačke zone u centru Grada Zagreba

Sažetak:

Kretanje je temeljno pravo svakoga čovjeka koje mu omogućuje odrađivanje svakodnevnih aktivnosti, a s druge strane izlaže ga velikim opasnostima. Ograničavanje kretanja pješaka s ciljem povećanja sigurnosti cestovnog prometa nije najbolji izbor, već treba težiti promicanju neovisnog i autonomnog kretanja pješaka.

Proširenje pješačke zone u centru Grada Zagreba idejno je rješenje koje je izradila tvrtka Mobilita Evolva d.o.o. U istoimeni elaborat uključeni su i učenici završnih razreda Škole za cestovni promet iz Zagreba koji su na određenim mjestima u užem centru Grada brojali motorizirani i nemotorizirani promet. Na temelju dobivenih rezultata Tvrtka Mobilita Evolva d.o.o. napravila je prometni model s tri varijantna rješenja koja uključuju broj potrebnih ulica, parkirnih mjesta, ukupne površine i izgradnju novih garaža. Za svako rješenje napravljena je višekriterijska analiza. Varijantna rješenja su se interno evaluirala kako bi se odabrala optimalna solucija. Odabirom optimalnog rješenja slijede daljnje aktivnosti vezane za ishođenje potrebnih suglasnosti, donošenje rješenja i implementaciju na terenu.

Uključenost učenika u izradu idejnog rješenja proširenja pješačke zone u Gradu Zagrebu ima utjecaj na povezivanje obrazovanja s realnim sektorom.

Ključne riječi:

- sigurnost prometa
- pješačka zona
- obrazovanje

PROŠIRENJE PJEŠAČKE ZONE U CENTRU GRADA ZAGREBA

I. Cilj i svrha izrade elaborata

Bilježenjem stope rasta te razvoja generatora odnosno atraktora putovanja u gradskom središtu posljednjih godina, direktno se utječe na povećanje prometne potražnje. Problematika se javlja u neadekvatnoj povezanosti mreže pješačkih koridora te je ista mreža isprekidana. Osim kolizije pješačkog i biciklističkog prometa u užem centru centra grada dolazi i do kolizije s motoriziranim prometom što znatno utječe na sigurnost odvijanja prometa najugroženijih skupina (pješaka).

Cilj elaborata je kroz detaljnu analizu postojećeg stanja, pregledom tehničke značajke prometne mreže i sigurnosnih uvjeta za nesmetano odvijanje motoriziranog i nemotoriziranog prometa utvrditi nedostatke na mreži pješačkih koridora te kroz pregled relevantne projektne i studijske dokumentacije uklopiti varijantna rješenja u već planirana. Analizom organizacije pješačkih zona u sličnim europskim gradovima nastoji se uvidjeti utjecaj već provedenih postupaka organizacije prometa u pješačkim zonama te načinima uvođenja istih. [3]

Svrha je istražiti i predložiti mogućnosti i potrebe proširenja i povezivanja mreže pješačke zone pritom uzimajući u obzir utjecaj istog na funkcionalnu revitalizaciju i/ili fizionomsku obnovu prostora te sukladno navedenome iznijeti idejna rješenja. Proširenjem pješačke zone odnosno izbacivanjem motornih vozila iz užeg središta Grada želi se ostvariti ušteda energije u prometnom sustavu, povećanje razina sigurnosti pješačkog i biciklističkog prometa, smanjenje emisije štetnih plinova te razine buke motoriziranog prometa, povećanje protočnosti ljudi kroz centar grada, ostvarenje ekonomske koristi u vidu otvaranja novih radnih mjesta u trgovini i pružanju usluga (restorani i kafići), poticanje zdravstvene koristi u vidu pješačenja i korištenja bicikla te poticanje korištenja javnog prijevoza, povećanje atraktivnost građevina i gospodarske aktivnosti te razvoj kulture i umjetnosti s ciljem poboljšanja suživota građana.[4]

II. Metodologija brojenja prometa

Osnovna zadaća brojenja prometa je realan prikaz dinamike prometnih tokova na mjernom mjestu u određenom vremenskom intervalu. Osnovni podaci dobiveni brojenjem prometa su broj vozila, struktura prometnog toka i smjer kretanja vozila. Osim tri osnovna parametra brojenjem je moguće ustanoviti i niz drugih značajki prometnog toka poput brzine vozila, razmaka između vozila te vršnog opterećenja. Brojenjem se dobiva uvid u trenutno stanje prometa te prikazani podaci predstavljaju osnovu za prognoziranje, planiranje i projektiranje odnosno rekonstrukciju prometnog sustava s ciljem poboljšanja istog što u konačnici rezultira smanjenjem eksternih troškova u prometu odnosno povećanjem kvalitete življenja posebice u užim centrima gradova.

[3] Prometni elaborat, Idejno rješenje proširenja pješačke zone u centru grada zagreba, Zagreb, veljača, 2020.

[4] Ibidem, str. 7

III. Prostorni obuhvat elaborata

Prostorni obuhvat elaborata smješten je u dijelu Gradu Zagrebu koji se proteže kroz dvije gradske četvrti, Gornji Grad – Medveščak i Donji Grad. Ukupna površina područja obuhvata iznosi oko 2.146.850 m2. Slika 1. prikazuje mikrolokaciju područja obuhvata elaborata.

Slika 1. Mikrolokacija područja obuhvata elaborata[5]

Prometnim elaboratom obuhvaćeno je šire područje središnjeg dijela Grada s posebnim osvrtom na mogućnosti i potrebom za proširenje postojeće pješačke zone. Područje obuhvata definirano je sljedećim prometnicama:

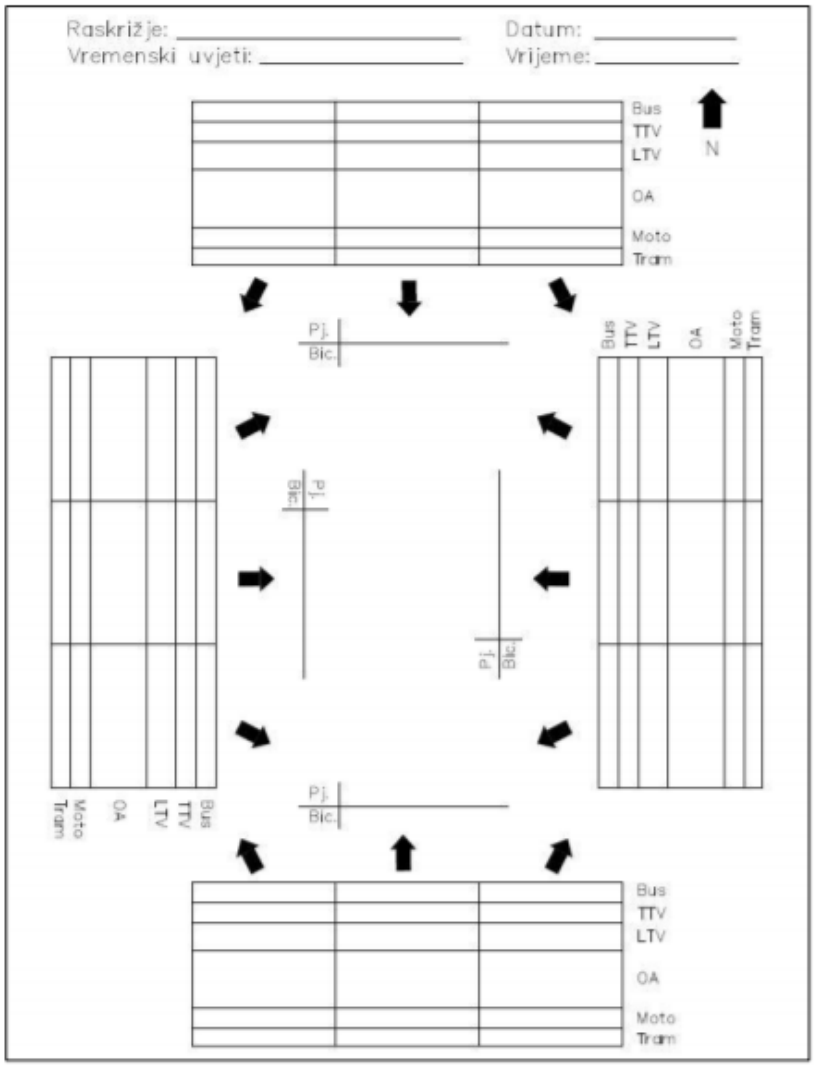
[5] Ibidem. str. 11

- Na zapadnom dijelu obuhvat je definiran Savskom cestom i Frankopanskom ulicom,
- Na južnom dijelu obuhvat je definiran Zagrebačkim Glavnim kolodvorom odnosno željezničkom prugom i Ulicom Kneza Branimira,
- Na sjevernom dijelu obuhvat je definiran Ulicom Gupčeva Zvijezda i Ulicom Antuna Vrančića,
- Na istočnom dijelu obuhvat je definiran Draškovićevom ulicom, Vlaškom ulicom, Ulicom Franje Račkog, Ulicom Kneza Višeslava te Hrvatskim društvom likovnih umjetnika.

U obuhvat ulazi i lokacije prema, i iz kojih generatori putovanja dolaze do pješačke zone u središnjem dijelu Grada (pješačke ulice, trgovi, pješački prolazi), a odnose se na autobusne terminale, željezničke kolodvore, turističke atrakcije, ugostiteljske objekte, kulturno umjetničke ustanove, trgovačke centre, hotele te ostale smještajne kapacitete.

IV. Metodologija brojenja motoriziranog i nemotoriziranog prometa

Brojenja na raskrižjima i prometnim presjecima provedena su referentnim danima u tjednu zadanim projektnim zadatkom za sve lokacije u vremenskim periodima jutarnjeg i popodnevnog vršnog opterećenja te u jednom izvan vršnog opterećenja u intervalima od po dva sata. Za jutarnji vršni sat zadan je interval od 07:00 do 09:00 sati, a za popodnevni od 15:00 do 17:00 sati. Period izvan vršnog brojenja zadan je od 19:00 do 21:00 sati. U svrhu analize postojećeg stanja prometnog elaborata provedeno je također i brojenje referentnog vikenda (dana subote) u pripadajućim terminima vršnih opterećenja. Termini vršnih opterećenja dana subote su od 10:00 do 14:00 sati te od 19:00 do 21:00 sati poslijepodne. Brojenje prometa provedeno je ručno zapisivanjem na brojačke listiće uz prethodnu edukaciju brojitelja prometa (učenici završnih razreda Škole za cestovni promet, smjer tehničar za cestovni promet). Kako bi se precizno odredila vremenska neravnomjernost u prometnom toku brojenje prometa provedeno je u vremenskim intervalima po 15 minuta. Struktura vozila koja se bilježila na brojački listić podijeljena je u šest osnovnih kategorija za motorizirana vozila: motocikli, osobni automobili, laka teretna vozila, teška teretna vozila, autobusi i tramvaji. Osim motoriziranih skupina brojene su i ne motorizirane skupine: pješaci i biciklisti.



Slika 2. prikaz brojačkog listića[6]

V. Područje obuhvata brojenja motoriziranog i nemotoriziranog prometa

Područje obuhvata brojenja motoriziranog cestovnog i nemotoriziranog prometa odnosi se na dio središta grada Zagreba. Potrebno je bilo izvršiti minimalno brojenje prometa na ulazu i izlazu iz zone obuhvata, koja je definirana projektnim zadatkom te su dodatno provedena brojenja i pojedinih lokacija unutar zone obuhvata koje su bitne za bolji uvid u kretanje svih vrsta prometa sa posebnim naglaskom na nemotorizirani promet odnosno pješake. Slika 3. prikazuje lokacije brojenja motoriziranog cestovnog i nemotoriziranog prometa. Crvenim kružićem prikazane su lokacije brojenja svih vrsta prometa na presjecima, plavim kružićem prikazane su lokacije brojenja svih vrsta prometa na raskrižjima te su žutom bojom prikazane sve lokacije brojenja nemotoriziranog (pješačkog i biciklističkog) prometa na presjecima ulica.

[6] Ibidem, str. 13

Slika 3. Prostorni prikaz lokacija brojanja[7]

VI. Prijedlozi proširenja pješačke zone u gradu Zagrebu

Prijedlozi proširenja pješačke zone prikazane su u tri varijante. Prva varijanta obuhvaća zatvaranje 37 ulica, druga varijanta obuhvaća zatvaranje 55 ulica dok treća varijanta obuhvaća zatvaranje 95 ulica za promet motornih vozila.

a. Prvo varijantno rješenje

[7] Ibidem, str. 16

S obzirom na to da se Varijanta 1 provodi na površinski najmanjem prostoru (obuhvaća 9,73 % od ukupne površine obuhvata elaborata) te obuhvaća najmanji broj ulica, njene najznačajnije komparativne prednosti u odnosu na druge varijante su kraći vremenski period provedbe i najniža financijska izdavanja, jer je za njenu provedbu potrebno najmanje zahvata u prostoru i prometnom sustavu. Također, provedba Varijante 1, pogodna je iz razloga što je pristup svim planiranim garažama moguć bez prolaska kroz pješačku zonu, dok je kod provedbe ostalih varijanti u sklopu pješačke zone potrebno predvidjeti prostor za pristup garažama za vozila koja imaju dozvolu za prometovanje kroz pješačku zonu.

Prema prometno-tehnoloških kriterijima, provedba Varijante 1, najmanje je kompleksna jer zahtjeva ukidanje najmanje parkirnih mjesta i za njenu provedbu potrebno je izgraditi najmanje novih garaža, ali se njome postiže i najmanja razina integracije pješačkog prometa s javnim gradskim prijevozom. [8]

b. Drugo varijantno rješenje

Varijanta 2, prema gotovo svim podkriterijima nalazi se između Varijante 1 i Varijante 3. Promatrajući prostorno-urbanističke kriterije Varijanta 2 predstavlja zapravo daljnju fazu širenja pješačke zone u odnosu na Varijantu 1 te je njome obuhvaćeno sveukupno 12,85 % od ukupne površine prostora obuhvata elaborata. S obzirom na veći prostor obuhvata Varijante 2 njome se omogućava i pristup većem broju točaka od interesa, kao i veća cjelovitost pješačkog koridora. U odnosu na Varijantu 1, Varijantom 2 se pješački promet integrira s javnim prijevozom na većem broju lokacija, ali je potrebno izgraditi dvije garaže više u odnosu na Varijantu 1. Ipak radi manjeg prostora obuhvata, Varijanta 2 u odnosu na Varijantu 3 ima manji utjecaj na smanjenje razine emisije štetnih plinova i razinu emisije buke iz prometa te je njenom provedbom manja mogućnost implementacije pametnih tehnologija i proširenja zelenila i zelenih površina u odnosu na Varijantu 3.[9]

c. Treće varijantno rješenje

Varijanta 3 predstavlja najkompleksniju promjenu, pa su shodno tome procijenjeni investicijski troškovi 3.5 puta veći za provedbu Varijante 3 u odnosu na Varijantu 1, te dvostruko veći za provedbu Varijante 3 u odnosu na provedbu Varijante 2. Po pitanju troškova održavanja ta razlika je još veća, odnosno procijenjeni troškovi održavanja sedam puta veći kod Varijante 3 u odnosu na Varijantu 1, te četiri puta veći u odnosu na Varijantu 2. S obzirom da Varijanta 3 ima najveći prostorni obuhvat (23 % od ukupne površine prostora obuhvata elaborata), njome se postižu i najveći učinci po pitanju smanjenja razine emisije štetnih čestica kao i smanjenja razine buke iz prometa.

Osim toga, Varijantom 3 je obuhvaćen i najveći broj stanovnika, te je omogućeno stvaranje najvećeg broja novih prostora za rekreaciju, najveće su mogućnosti za implementaciju pametnih tehnologija te je najpovoljnija po sigurnosnom kriteriju jer na značajnom dijelu prostora obuhvata je motorizirani promet u potpunosti eliminiran.[10]

[8] Ibidem str. 132
[9] Ibidem str. 133
[10] Ibidem str. 133

VII. Zaključak

Analizom je utvrđeno da pješačku zonu središta grada Zagreba čini sustav pješačkih trgova, ulica i prolaza površine oko 98.800 m². Funkcionalno, pješačka zona najviše odiše trgovačkim sadržajem u iznosu od 27,7%, sadržajem profesionalnih usluga 21,7% te 18,6% ugostiteljskim objektima. Biciklistička infrastruktura na području obuhvata elaborata sastoji se od biciklističkih staza, traka i „zone 30“ u kojoj dolazi do interakcije motoriziranih vozila i biciklista s preporučenom brzinom kretanja od 30 km/h. Terenskim istraživanjem utvrđena je ukupna duljina biciklističke infrastrukture oko 8,1 km.

Ovim rješenjima bi se uvelike digla kvaliteta života stanovništva i posjetitelja u zoni obuhvata ovog elaborata. Širenjem pješake zone ne dobivaju se samo novi pravci za pješake, već i novi biciklistički koridori koji se mogu implementirati uz rubove pješačke zone što potiče razvoj novih sustava kao na primjer „bike and ride“ sustava.

Implementacija novih pješačkih koridora te uvođenje održivih oblika prijevoza u skladu je sa smjernicama urbane mobilnosti Europske unije. Modalnom raspodjelom putovanja („modal shift“) određeno je koliki će se broj putovanja obaviti određenim prijevoznim sredstvom na području obuhvaćenom prometnim planom. Provođenjem širenja pješačke zone smanjio broj putovanja osobnim automobilom te dolazi do povećanja putovanja biciklom za 15% i povećanje pješačenja u zoni obuhvata za 20% u odnosu na postojeće stanje. Temeljem izrade simulacijskog modela te simulacijom kretanja pješaka za proširenje pješačke zone kroz Varijantu 2, procijenjeno je da će se 40% više ljudi odlučiti da do svog odredišta u zoni obuhvata koristi pješačenje, putovanje biciklom i javni gradski prijevoz umjesto osobnog automobila.

VIII. Literatura

1. Prometni elaborat, Idejno rješenje proširenja pješačke zone u centru grada zagreba, Zagreb, veljača, 2020.

SCHOOL FOR ROAD TRAFFIC, ZAGREB, CROATIA

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Expansion of the pedestrian zone in the center of the City of Zagreb

Abstract:

Movement is a fundamental right of every man that allows him to perform daily activities, and on the other hand exposes him to great dangers. Restricting pedestrian movement with the aim of increasing road safety is not the best choice, but should strive to promote independent and autonomous pedestrian movement. The expansion of the pedestrian zone in the center of the City of Zagreb is a conceptual solution developed by the company Mobilita Evolva d.o.o. The eponymous study also includes students in the final grades of the School of Road Traffic from Zagreb, who counted motorized and non-motorized traffic in certain places in the city center. Based on the obtained results, the company Mobilita Evolva d.o.o. made a traffic model with three variant solutions that include the number of required streets, parking spaces, total area and construction of new garages. A multi-criteria analysis was performed for each solution. Variant solutions were evaluated internally to select the optimal solution. The selection of the optimal solution is followed by further activities related to obtaining the necessary approvals, decision-making and implementation in the field. The involvement of students in the development of the conceptual solution for the expansion of the pedestrian zone in the City of Zagreb has an impact on connecting education with the real sector.

Keywords:

- traffic safety
- Pedestrian zone
- Education

EXTENSION OF THE PEDESTRIAN ZONE IN THE CENTER OF THE CITY OF ZAGREB

I. Aim and purpose of the study

By recording the growth rate and development of generators or travel attractors in the city center in recent years, it directly affects the increase in traffic demand. The problem arises in the inadequate connection of the network of pedestrian corridors and the same network is interrupted. In addition to the collision of pedestrian and bicycle traffic in the center of the city, there is also a collision with motorized traffic, which significantly affects the safety of traffic of the most vulnerable groups (pedestrians). The aim of the study is to identify deficiencies in the network of pedestrian corridors through a detailed analysis of the current situation, review of the technical characteristics of the transport network and safety conditions for smooth and motorized traffic and to incorporate variant solutions into the already planned ones through a review of relevant project and study documentation. The analysis of the organization of pedestrian zones in similar European cities seeks to see the impact of the already implemented procedures for the organization of traffic in pedestrian zones and the ways of introducing them.[11] The purpose is to investigate and propose the possibilities and needs of expanding and connecting the network of the pedestrian zone, taking into account the impact of the same on the functional revitalization and / or physiognomic renovation of the space and in accordance with the above to present conceptual solutions. By expanding the pedestrian zone or removing motor vehicles from the city center, the aim is to save energy in the transport system, increase the level of safety of pedestrian and bicycle traffic, reduce emissions and noise levels of motorized traffic, increase the flow of people through the city center. creating new jobs in trade and services (restaurants and cafes), encouraging health benefits in the form of walking and using bicycles and encouraging the use of public transport, increasing the attractiveness of buildings and economic activities and developing culture and arts to improve the coexistence of citizens.[12]

II. Traffic counting methodology

The basic task of traffic counting is a realistic presentation of the dynamics of traffic flows at the measuring point in a certain time interval. The basic data obtained by counting the traffic are the number of vehicles, the structure of the traffic flow and the direction of movement of the vehicle. In addition to the

[11] Traffic study, Preliminary design for the expansion of the pedestrian zone in the center of Zagreb, Zagreb, February, 2020.
[12] Ibidem, str. 7

three basic parameters, it is possible to establish a number of other characteristics of the traffic flow by counting, such as vehicle speed, distance between vehicles and peak load. The count provides an insight into the current state of traffic and the presented data are the basis for forecasting, planning and designing or reconstructing the transport system with the aim of improving it, which ultimately results in reducing external costs in traffic and increasing quality of life, especially in urban centers.

III. Spatial scope of the study

The spatial scope of the study is located in the part of the City of Zagreb that extends through two city districts, Gornji Grad - Medveščak and Donji Grad. The total area of the coverage area is about 2,146,850 m2. Figure 1 shows the microlocation of the study area.

Figure 1. Microlocation of the study area[13]

[13] Ibidem. str. 11

The traffic study covers a wider area of the central part of the City with special reference to the possibilities and needs for the expansion of the existing pedestrian zone. The coverage area is defined by the following roads:

- In the western part, the coverage is defined by Savska cesta and Frankopanska ulica,
- In the southern part, the coverage is defined by the Zagreb Central Station, ie the railway and Kneza Branimira Street,
- In the northern part, the coverage is defined by Gupčeva Zvijezda Street and Antun Vrančić Street,
- In the eastern part, the coverage is defined by Draškovićeva Street, Vlaška Street, Franje Račkog Street, Kneza Višeslava Street and the Croatian Society of Fine Artists.

The scope also includes locations according to, and from which travel generators come to the pedestrian zone in the central part of the City (pedestrian streets, squares, pedestrian passages), and relate to bus terminals, railway stations, tourist attractions, restaurants, cultural and artistic institutions, shopping malls, hotels and other accommodation facilities.

IV. Methodology for counting motorized and non-motorized traffic

Counts at intersections and traffic intersections were performed on reference days in the week given by the project task for all locations in the time periods of morning and afternoon peak load and in one outside the peak load at intervals of two hours. For the morning peak hour, the interval is from 07:00 to 09:00, and for the afternoon from 15:00 to 17:00. The period outside the peak count is set from 19:00 to 21:00. For the purpose of analyzing the current state of the traffic study, the reference weekend (Saturday) was counted in the corresponding peak load terms. The peak load times on Saturday are from 10:00 to 14:00 and from 19:00 to 21:00 in the afternoon. Traffic counting was carried out manually by writing on counting sheets with prior education of traffic counters (students of the final grades of the School of Road Traffic, majoring in road traffic technician). In order to accurately determine the time irregularity in the traffic flow, the traffic counting was performed at time intervals of 15 minutes. The structure of the vehicles recorded on the ballot paper was divided into six basic categories for motorized vehicles: motorcycles, passenger cars, light trucks, heavy goods vehicles, buses and trams. In addition to motorized groups, there are also non-motorized groups: pedestrians and cyclists.

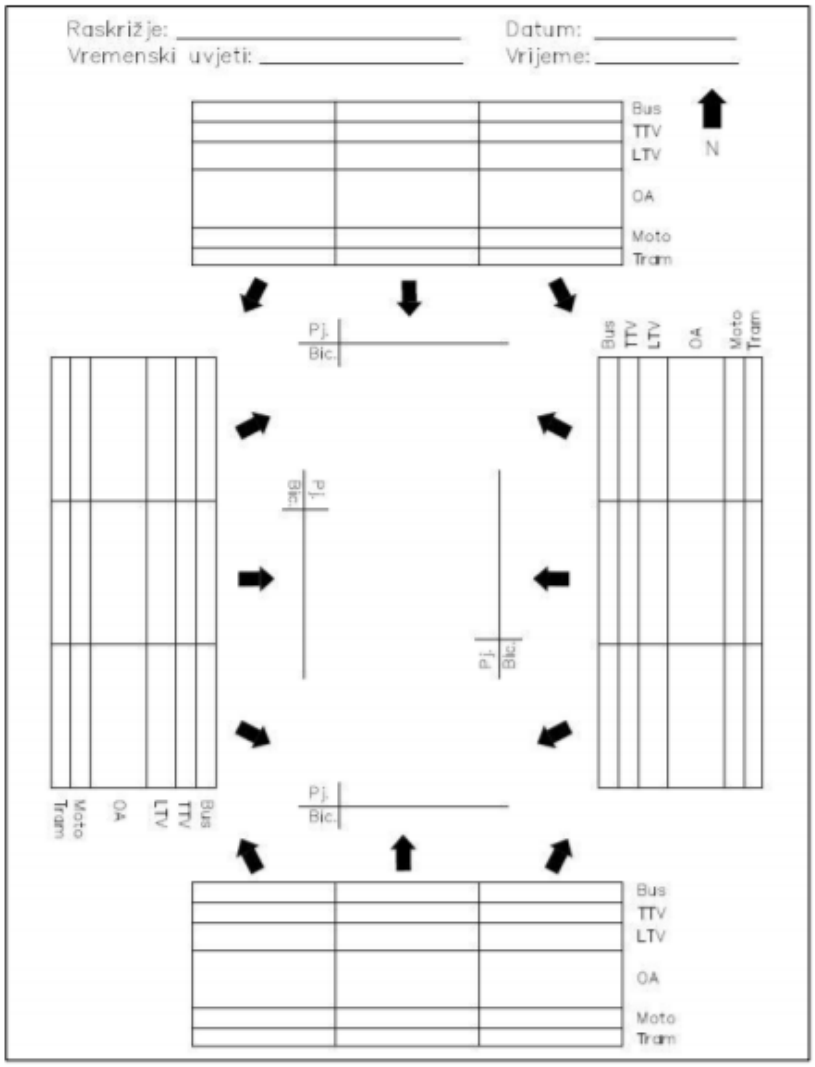

Figure 2. Counting sheet[14]

V. The area includes counting of motorized and non-motorized traffic

The area of counting motorized road and non-motorized traffic refers to a part of the center of the city of Zagreb. It was necessary to perform a minimum traffic count at the entrance and exit from the coverage area, which is defined by the project task, and additional counts were performed and individual locations within the coverage area that are important for better insight into the movement of all types of traffic with special emphasis on non-motorized traffic. . Figure 3 shows the counting locations of motorized road and non-motorized traffic. The red circle shows the counting locations of all types of traffic at

[14] Ibidem, str. 13

intersections, the blue circle shows the counting locations of all types of traffic at intersections and the yellow circle shows all counting locations of non-motorized (pedestrian and bicycle) traffic at street intersections.

Figure 3. Spatial representation of counting locations[15]

VI. Proposals for the expansion of the pedestrian zone in the city of Zagreb

Proposals for widening the pedestrian zone are presented in three variants. The first variant involves the closure of 37 streets, the second variant involves the closure of 55 streets while the third variant involves the closure of 95 streets for motor vehicle traffic.

[15] Ibidem, str. 16

a. The first variant solution

Given that Variant 1 is implemented in the smallest area (covers 9.73% of the total area covered by the study) and covers the smallest number of streets, its most significant comparative advantages over other variants are a shorter implementation period and the lowest financial expenditures, because its implementation requires the least intervention in space and the traffic system. Also, the implementation of Variant 1 is suitable because access to all planned garages is possible without passing through the pedestrian zone, while in the implementation of other variants within the pedestrian zone it is necessary to provide space for garages for vehicles licensed to pass through the pedestrian zone. According to traffic technology criteria, the implementation of Variant 1 is the least complex because it requires the abolition of the least parking spaces and for its implementation it is necessary to build at least new garages, but it also achieves the lowest level of integration of pedestrian traffic with public transport.[16]

b. Another variant solution

Variant 2, according to almost all sub-criteria, is located between Variant 1 and Variant 3. Observing the spatial-urban criteria, Variant 2 actually represents a further phase of expanding the pedestrian zone in relation to Variant 1 and covers a total of 12.85% of the total study area. . Given the larger scope of Variant 2, it also allows access to a larger number of points of interest, as well as greater integrity of the pedestrian corridor. Compared to Option 1, Option 2 integrates pedestrian traffic with public transport in more locations, but it is necessary to build two more garages compared to Option 1. However, due to the smaller coverage area, Option 2 has less impact on Option 3 compared to Option 3. reducing the level of harmful gas emissions and the level of noise emissions from traffic, and its implementation reduces the possibility of implementing smart technologies and expanding greenery and green areas compared to Option 3.[17]

c. The third variant solution

Variant 3 represents the most complex change, so the estimated investment costs are 3.5 times higher for the implementation of Variant 3 compared to Variant 1, and twice as high for the implementation of Variant 3 compared to the implementation of Variant 2. In terms of maintenance costs, this difference is even higher, that is, the estimated maintenance costs are seven times higher in Option 3 compared to Option 1, and four times higher compared to Option 2. Given that Option 3 has the largest spatial coverage (23% of the total

[16] Ibidem, str. 132
[17] Ibidem, str. 133

area covered by the study), it also achieves the greatest effects in terms of reducing the level of emissions of harmful particles as well as reducing the level of noise from traffic. In addition, Variant 3 covers the largest number of inhabitants, and enables the creation of the largest number of new recreational spaces, the greatest opportunities for the implementation of smart technologies and is the most favorable in terms of safety criteria because a significant part of the coverage area is completely eliminated.[18]

VII. Conclusion

The analysis established that the pedestrian zone of the center of the city of Zagreb consists of a system of pedestrian squares, streets and passages with an area of about 98,800 m2. Functionally, the pedestrian zone exudes the most trade content in the amount of 27.7%, the content of professional services 21.7% and 18.6% catering facilities. The cycling infrastructure in the area covered by the study consists of bicycle paths, lanes and "zone 30" in which motorized vehicles and cyclists interact with the recommended speed of 30 km / h. The field research determined the total length of the cycling infrastructure of about 8.1 km. These solutions would greatly increase the quality of life of the population and visitors in the scope of this study. With the expansion of the pedestrian zone, not only new routes for pedestrians are obtained, but also new bicycle corridors that can be implemented along the edges of the pedestrian zone, which encourages the development of new systems such as bike and ride systems. The implementation of new pedestrian corridors and the introduction of sustainable forms of transport is in line with the European Union's urban mobility guidelines. The modal shift determines how many trips will be made by a particular means of transport in the area covered by the traffic plan. By implementing the expansion of the pedestrian zone, it reduced the number of passenger car journeys and there was an increase in bicycle travel by 15% and an increase in pedestrian zone coverage by 20% compared to the existing situation. Based on the development of a simulation model and the simulation of pedestrian movement to expand the pedestrian zone through Option 2, it is estimated that 40% more people will choose to use walking, cycling and public transport instead of a car to reach their destination in the coverage area.

VIII. Literature

1. Traffic study, Preliminary design for the expansion of the pedestrian zone in the center of Zagreb, Zagreb, February, 2020.

[18] Ibidem, str. 133

КОМПАРАТИВНА АНАЛИЗА ЗНАЊА ВОЗАЧА СА ПРОБНОМ ВОЗАЧКОМ ДОЗВОЛОМ У ЗАВИСНОСТИ ОД НАЧИНА ОСПОСОБЉАВАЊА

Ивица Ристић[19], Ивана Селенић[20], Милица Цветковић[21]

Резиме: Оспособљавање возача је основа од чијег квалитета у многоме зависи какав ће се возач у саобраћају наћи након полагања испита и добијања возачке дозволе. У Србији оспособљавање возача могу вршити средње стручне школе или привредна друштва. Теоријском, као и практичном обуком кандидатима се поред стицања знања и вештина, жели формирати правилан став о безбедном учешћу у саобраћају. Циљ рада је да се сагледају и анализирају знања возача са пробном возачком дозволом који су обуку завршили у привредним субјектима, као и знања возача који су обуку завршили у средњим стручним школама. Упоређивање знања ће се извршити на основу тестова који ће се спровести са ове две категорије младих возача. У оквиру рада биће извршено и поређење знања особа женског пола у односу на особе мушког пола, старосне доби од 17 до 19 година. Тестирање је вршено у два града Врању и Богатићу. Тестирању је било подвргнуто 144 возача са пробном возачком дозволом. Генерално гледано ученици који су возачку дозволу стекли код привредних друштава имају веће знање о учешћу у саобраћају у односу на ученике који су возачку дозволу стекли кроз средње стручне саобраћајне школе.

Кључне речи: оспособљавање кандидата, знање, безбедност саобраћаја

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УВОД

Оспособљавање возача је основа од чијег квалитета у многоме зависи какав ће се возач у саобраћају наћи након полагања испита и добијања возачке дозволе. У Србији оспособљавање возача могу вршити средње стручне школе или привредна друштва. Теоријском, као и практичном обуком кандидатима се, поред стицања знања и вештина жели формирати правилан став о безбедном учешћу у саобраћају.

Циљ рада је да се сагледају и анализирају знања возача са пробном возачком дозволом који су обуку завршили у привредним субјектима, као и знања возача који су обуку завршили у средњим стручним школама.

Возачи који су стекли возачку дозволу у средњим стручним школама, знање за познавање саобраћајних прописа стичу кроз четворогодишње школовање. Ученици смера техничар друмског саобраћаја имају у другој години предмет Регулисање и безбедност саобраћаја који има фонд часова 70 годишње, односно два пута недељно. Такође, из премета Практична настава у другој години имају блок наставу која траје 30 часова годишње, која се реализује у једној недељи по 6 часова дневно. Ученици смера техничар друмског саобраћаја имају 100 часова годишње у другој години средње школе на којима слушају наставу везану за познавање саобраћајних прописа. Ученици смера техничар унутрашњег транспорта у другој години из предмета Практична настава имају блок наставу која траје 20 часова годишње, која се реализује у једној недељи по 4 часа дневно и у трећој години имају блок наставу која траје 30 часова годишње, која се реализује у једној недељи по 6 часова дневно. Ученици смера техничар унутрашњег транспорта имају 50 часова у другој и трећој години средње школе на којима слушају наставу везану за познавање саобраћајних прописа.

Возачи који стичу возачку дозволу у ауто школама слушају теоријску наставу о познавању саобраћајних прописа у виду 40 часова који се реализују за 14 радних дана.

Заборављање је активан процес у људском организму. Ниво познавања саобраћајних правила и прописа се често смањује проласком дужег временског периода, јер се нека правила која се дуже не примењују и заборављају.

Метод истраживања

У овом раду вршено је тестирање познавања саобраћајних прописа и правила возача који су возачку дозволу стекли кроз средње стручне саобраћајне школе и возача који су возачку дозволу стекли у привредним друштвима – ауто школама. Сви испитаници су ученици средњих школа у Врању и Богатићу. Тестирању је било подвргнуто укупно 144 возача, од тог броја по 72 возача који су возачку дозволу стекли кроз средње стручне саобраћајне школе и ауто школе. Од укупног броја возача који су стекли возачку дозволу у средњим стручним школама 27 особа су женског пола, а 45 мушког пола. Од укупног броја возача који су стекли возачку дозволу у ауто школама 34 особа су женског пола, а 38 мушког пола.

Истраживање је рађено 16.04.2021. године у Врању и 23.04.2021. године у Богатићу.

Возачи који су возачку дозволу стекли кроз средње стручне школе су образовних профила техничар друмског саобраћаја и техничар унутрашњег транспорта. Возачи који су возачку дозволу стекли у ауто школама су из Гимназије, Економске школе, Медицинске школе, Пољопривредне школе, Хемијско-технолошке школе - разних смерова.

Старост возача који су стекли возачку дозволу у стручним школама била је од 17 до 19 година. Од тог броја 15 возача са 17 година, 41 возач са 18 година и 16 возача са 19 година. Старост возача који

су стекли возачку дозволу у ауто школама била је од 17 до 19 година. Од тог броја 29 возача са 17 година, 33 возача са 18 година и 10 возача са 19 година.

Возачи су стекли возачке дозволе у периоду од 2019. до 2021. године. Од тог броја 12 возача је стекло возачку дозволу 2019. године, 40 возача је стекло 2020. године и 20 возача 2021. године. Ови подаци се односе на стучне школе.

Возачи су стекли возачке дозволе у периоду од 2019. до 2021. године. Од тог броја 5 возача је стекло возачку дозволу 2019. године, 45 возача је стекло 2020. године и 22 возача 2021. године. Ови подаци се односе на ауто школе.

Сви возачи који су стекли пробну возачку дозволу у средњим стручним школама су имали пробну возачку дозволу „B“ категорије. Возачи, њих 17 који су стекли пробну возачку дозволу у ауто школама, имало је пробну возачку дозволу „A1“ категорије, 62 је имало пробну возачку дозволу „B“ категорије, 7 је имало пробну возачку дозволу „A1“ и „B“ категорије.

Возачи нису били упознати да ће бити извршено тестирање. Приликом позивања обавештени су да треба да дођу да би урадили анкету за научни рад.

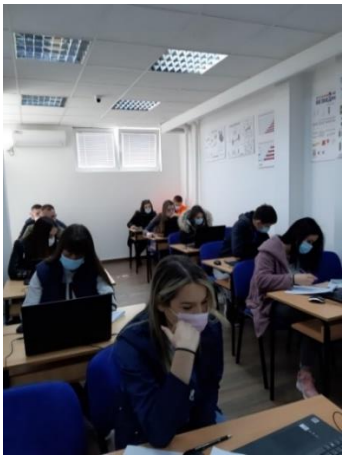
Сви возачи су били подвргнути тестирању које се састојало из два дела. У првом делу испитаници су решавали теоријски тест о познавању правила у саобраћају који се користе у средњим стручним школама, а које је објавила Заједница саобраћајних школа Републике Србије. Овај тест се решавао у штампаној форми. У другом делу испитаници су решавали теоријски тест (симулације теоријског испита) који се користи за полагање испита у ауто школама. Овај тест се решавао на рачунарима.

Сваки испитаник је радио различит тест.

Тестови Заједнице саобраћајних школа Републике Србије имају укупно 50 питања подељених на 5 области. Максимални број бодова по тесту је био 110. У свакој области је било по 10 питања од чега:

- Прва област се састојала од питања са саобраћајним ситуацијама у сликама, која су носила 2 и 3 бода.
- Друга област се састојала од „сувих питања“ у вези са изразима, појмовима, правилима саобраћаја, која су носила од 1 до 3 бода.
- Трећа област се састојала од саобраћајних знакова који су носили по 2 бода.
- Четврта област се састојала од две раскрснице које су носиле по 4 бода и допунских табли, ознака на коловозу, знакова која дају овлашћена лица која су носила од 1 до 3 бода.
- Пета област се састојала од „сувих питања“ у вези са одузимањем возачке дозволе, искључења возила и возача, техничким прегледима, која су носила 1 и 2 бода.

Тестови који се користе у ауто школама су званични тестови Министарства унутрашњих послова Републике Србије, имају укупно 41 питање подељено на 9 области. Максимални број бодова по тесту је био 100.



Слика 1. Приказ тестирања

Возачи су попуњавали и анкетни упитник који је био анониман. Попунило га је 144 испитаника, који су наведени у претходном делу.

Анкета је садржала следећих 10 питања:

1. Пол?
2. Године живота?
3. Датум стицања пробне возачке дозволе?
4. Школа и смер?
5. Категорија пробне возачке дозволе?
6. Назив привредног друштва где сте положили возачки испит?
7. Да ли сте имали било какав саобраћајни прекршај од тренутка када сте стекли пробну возачку дозволу?
8. Уколико сте имали прекршај наведите врсту прекршаја.
9. Да ли сте имали саобраћајну незгоду у својству возача моторног возила, од тренутка када сте стекли пробну возачку дозволу?
10. Уколико сте имали саобраћајну незгоду у својству возача моторног возила, да ли сте ви узрок саобраћајне незгоде?

Код питања број 5, 7, 9 и 10 били су понуђени одговори.

Ограничавајући фактор овог истраживања је да је због сложене епидемиолошке ситуације у земљи, изабрана само једна ауто школа са највећом пролазношћу на теоријском делу испита. У овој ауто школи пролазност на теоријском делу испита је преко 90%.

резултати спроведеног истраживања

У табели 1 дати су упоредни резултати спроведеног теоријског дела тестирања на основу теста Заједнице саобраћајних школа. Табеларно су приказани резултати за возаче који су возачку дозволу стекли у стручној школи и за возаче који су возачку дозволу стекли у ауто школама и то збирно, као и резултати у зависности од пола возача.

Интересантан податак је да, уколико се посматра тест Заједнице саобраћајних школа и ако се разматра данашњи праг пролазности на теоријском испиту возачког испита од 85%, од укупно 144 испитаника положило би испит њих 26, односно 18,05% и то 15, односно 20,83% из групе возача који

су стекли возачку дозволу у стручним школама и 11, односно 15,28% који су стекли возачку дозволу у ауто школама. Посматрајући ове податке возачи који су стекли возачку дозволу у стручним школама имају боље резултате у односу на возаче који су стекли возачку дозволу у ауто школама. Истраживачи су били изненађени оваквим резултатом јер су очекивали већу пролазност и боље резултате возача из средњих стручних школа. Разлика је само 5,55%.

Од возача који су возачку дозволу стекли у средњим стручним школама, посматрајући тест Заједнице саобраћајних школа, највећи број бодова је остварио возач са 106 бодова, док је најмањи број бодова имао возач са 47 бодова. Најмањи број бодова код возача из ауто школа био је 48, а максималан 109 бодова.

Табела 1. Табеларни приказ резултата теоријског дела тестирања на основу теста Заједнице саобраћајних школа

Возачи средње стручне школе						
	жене		мушкарци		укупно	
	тачно (%)	нетачно (%)	тачно (%)	нетачно (%)	тачно (%)	нетачно (%)
I област	78,67	21,33	81,42	17,69	80,39	19,61
II област	76,64	23,36	79,49	20,51	78,42	21,58
III област	73,70	26,30	73,33	26,27	**73,47**	**26,53**
IV област	77,47	22,53	71,48	28,52	73,73	26,27
V област	61,73	38,27	60,15	39,95	60,74	39,26
Укупно					**74,63**	**25,37**
Возачи ауто школе						
	жене		мушкарци		укупно	
	тачно	нетачно	тачно	нетачно	тачно	нетачно

	(%)	(%)	(%)	(%)	(%)	(%)
I област	83,35	19,65	79,52	20,48	79,92	20,08
II област	75,75	24,25	70,15	29,85	72,84	27,16
III област	78,26	21,74	80,40	19,60	**79,38**	**20,63**
IV област	72,64	27,36	69,50	30,50	71,01	28,99
V област	72,46	27,54	65,33	34,67	68,75	31,25
Укупно					**74,68**	**25,32**

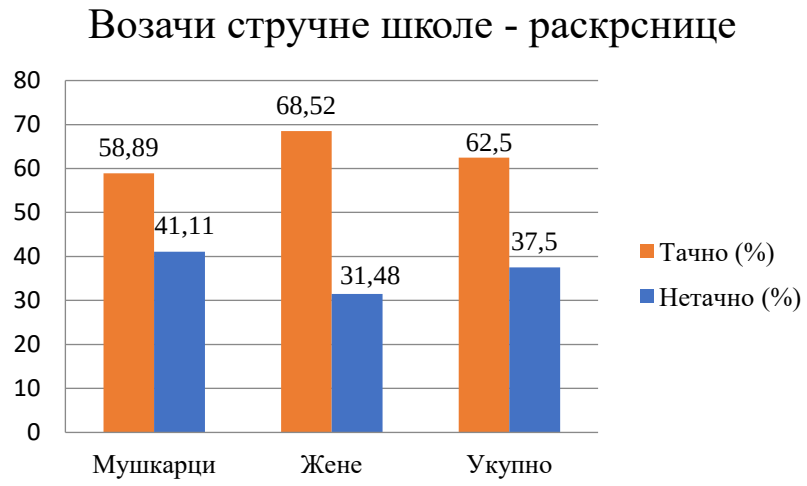
Ако се посматрају укупно добијени резултати, видимо да је код возача који су стекли пробну возачку дозволу у средњим стручним школама било 74,63% тачних одговора и 25,37% нетачних одговора. Код возача који су стекли пробну возачку дозволу у ауто школама било је 74,68% тачних и 25,32% нетачних одговора. Возачи из средњих стручних школа су били бољи за незнатних 0,05%.

Када се упореде возачи из стручних школа, жене су остварила боље резултате у односу на мушкарце, на трећој, четвртој и петој области. Мушкарци су били бољи из преостале две области.

Када се упореде возачи из ауто школа, жене су остварила боље резултате у односу на мушкарце, на првој, другој, четвртој и петој области. Мушкарци су били бољи у трећој области.

Посебно истичемо следећи податак, возачи из средњих стручних школа су погрешили 26,53% саобраћајних знакова. Возачи из ауто школа су погрешили 20,63% саобраћајних знакова. Возачи из средњих стручних школа нису знали значење сваког четвртог саобраћајног знака.

На следећа два графикона, слика 2 и слика 3 приказани су резултати тестирања испитаника за решавање раскрсница. Испитаници су имали да реше укупно 288 раскрсница тј. сваки испитаник по две. Резултати су приказани посебно за жене, посебно за мушкарце и укупно.



Слика 2. Графички приказ успешности решавања раскрснице – возачи стручне школе

Укупно је било 62,50% тачно решених раскрсница и 37,5% нетачних. Жене су имале 68,52% тачних одговора, мушкарци 58,89%. Жене су биле боље за 9,63%.

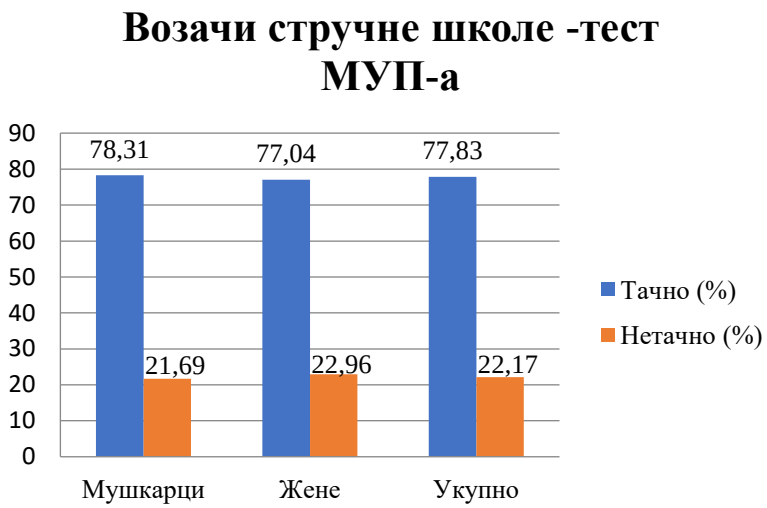
Слика 1. *Графички приказ успешности решавања раскрснице – возачи ауто школе*

Укупно је било 58,33% тачно решених раскрсница и 41,67% нетачних. Жене су имале 56,62% тачних одговора, мушкарци 60%. Мушкарци су били бољи за 3,38%. Напомињемо да су возачи из средњих стручних школа остварили боље резултате на раскрсницама. Забрињавајући резултат је што возачи из средњих стручних школа нису решили 37,50% раскрсница, а возачи из ауто школа нису решили 41,67% раскрсница, ситуација у којима се свакодневно налазе.

На следећа два графикона приказани су резултати спроведеног теоријског дела тестирања на основу теста Министарства унутрашњих послова. Графички су приказани резултати на сликама 4 и 5 за возаче који су возачку дозволу стекли у стручној школи и за возаче који су возачку дозволу стекли у ауто школама. Резултати су приказани посебно за жене, посебно за мушкарце и укупно.

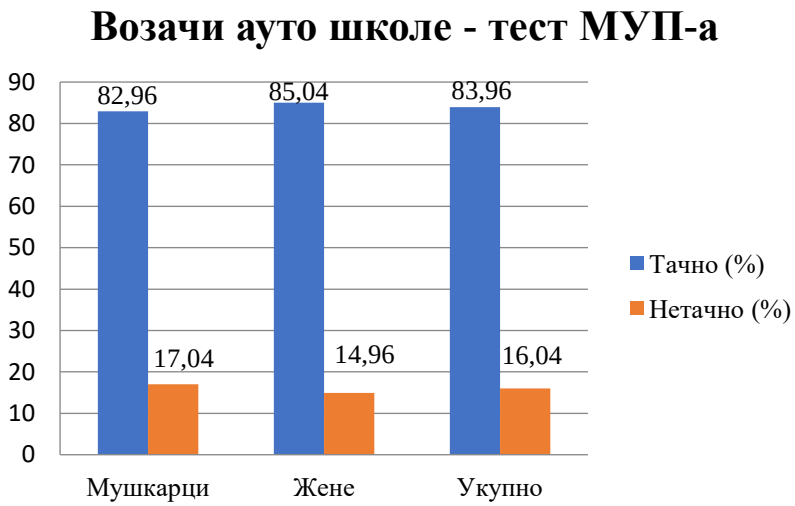
Интересантан податак је да, уколико се посматра тест Министарства унутрашњих послова и ако се разматра данашњи праг пролазности на теоријском испиту возачког испита од 85%, од укупно 144 испитаника положило би испит њих 56, односно 38,89% и то 20, односно 27,78% из групе возача који су стекли возачку дозволу у стручним школама и 36, односно 50,00% који су стекли возачку дозволу у ауто школама. Посматрајући ове податке возачи који су стекли возачку дозволу у ауто школама имају боље резултате у односу на возаче који су стекли возачку дозволу у стручним школама. Истраживачи су били изненађени оваквим резултатом јер су очекивали већу пролазност и боље резултате возача из средњих стручних школа. Разлика је чак 22,22%.

Од возача који су возачку дозволу стекли у средњим стручним школама, посматрајући тест Министарства унутрашњих послова, највећи број бодова је остварио возач са 98 бодова, док је најмањи број бодова имао возач са 52 бода. Најмањи број бодова код возача из ауто школа био је 56, а максималан 99 бодова.



Слика 2. *Графички приказ успешности решавања теста МУП-а – возачи стручне школе*

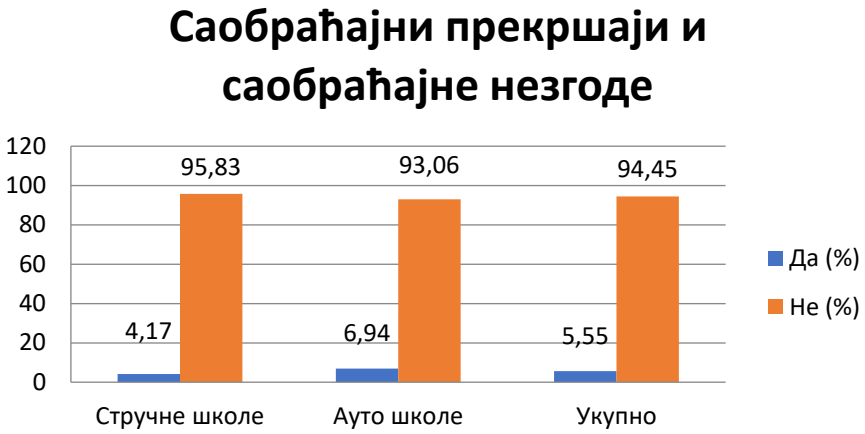
Укупно је било 77,83% тачних одговора и 22,17% нетачних. Жене су имале 77,04% тачних одговора, мушкарци 78,31%. Мушкарци су били бољи за 1,27%. Ови резултати се односе на стручне школе.



Слика 3. *Графички приказ успешности решавања теста МУП-а – возачи ауто школе*

Укупно је било 83,96% тачних одговора и 16,04% нетачних. Жене су имале 85,04% тачних одговора, мушкарци 82,96%. Жене су биле боље за 2,08%. Ови резултати се односе на ауто школе.

Посматрајући оба теста види се да су обе категорије возача показали боље резултате на тесту Министарства унутрашњих послова. Разлика је чак 20,84%. Разлоге треба тражити у концепту теста или у тежини теста. Морамо напоменути да тестови МУП-а имају више понуђених одговора са више тачних одговора, док тестови Заједнице саобраћајних школа имају више понуђених одговора са једним тачним одговором.



Слика 4. *Графички приказ саобраћајних прекршаја и саобраћајних незгода*

Посматрајући број саобраћајних прекршаја, на слици 6, видимо да су возачи из средњих стручних школа имали 3 прекршаја или 4,17%. Возачи из ауто школа су имали 5 прекршаја или 6,94%. Возачи из средњих стручних школа су имали мањи број прекршаја за 2,77%.

Посматрајући број саобраћајних незгода видимо да су возачи из средњих стручних школа имали 3 прекршаја или 4,17%. Возачи из ауто школа су имали 5 прекршаја или 6,94%. Возачи из средњих стручних школа су имали мањи број незгода за 2,77%. Посматрајући саобраћајне незгоде на основу анкетног упитника возачи из стручних школа нису били узрочници саобраћајних незгода. Возачи из ауто школа су били узрочници у 2 незгоде, односно 40% свих саобраћајних незгода.

закључак

Ограничење овог истраживања је да се ради о малим узорцима испитаника као и да примењена статистичка метода не даје довољно података да ли су разлике у постигнућу између две групе возача резултат случајности или системског деловања независних варијабли. Ограничавајући фактор овог истраживања је и да је због сложене епидемиолошке ситуације у земљи, изабрана само једна ауто школа са највећом пролазношћу на теоријском делу испита. У овој ауто школи пролазност на теоријском делу испита је преко 90%.

Посматрајући тест Заједнице саобраћајних школа и ако се разматра данашњи праг пролазности на теоријском испиту возачког испита од 85%, од укупно 144 испитаника положило би испит њих 26, односно 18,05% и то 15, односно 20,83% из групе возача који су стекли возачку дозволу у стручним школама и 11, односно 15,28% који су стекли возачку дозволу у ауто школама.

Уколико се посматра тест Министарства унутрашњих послова и ако се разматра данашњи праг пролазности на теоријском испиту возачког испита од 85%, од укупно 144 испитаника положило би испит њих 56, односно 38,89% и то 20, односно 27,78% из групе возача који су стекли возачку дозволу у стручним школама и 36, односно 50% који су стекли возачку дозволу у ауто школама.

Анализом оба теста (Министарства унутрашњих послова и Заједнице саобраћајних школа) ако се разматра данашњи праг пролазности на теоријском делу возачког испита од 85%, теоријски испит положило би 28,47% возача.

Упоређивајући оба теста возачи који су стекли возачку дозволу у ауто школама су били бољи од возача који су стекли возачку дозволу у средњим стручним школама за 8,33%. Овај резултат је био изненађење за истраживаче имајући у виду да је фонд часова који имају возачи у стручним школама много већи од фонда часова који возачи слушају у ауто школама. Осим тога у већини стручних предмета у средњим саобраћајним школама имамо области које обухватају саобраћајне прописе.

Возачи из средњих стручних школа су погрешили 26,53% саобраћајних знакова. Возачи из ауто школа су погрешили 20,63% саобраћајних знакова. Забрињавајући податак је да возачи из стручних школа нису знали значење сваког четвртог саобраћајног знака.

Забрињавајући резултат је што возачи из средњих стручних школа нису решили 37,50% раскрсница, а возачи из ауто школа нису решили 41,67% раскрсница, ситуација у којима се свакодневно налазе.

Посматрајући оба теста види се да су обе категорије возача показале боље резултате на тесту Министарства унутрашњих послова. Разлика је чак 20,84%. Разлоге треба тражити у концепту теста или у тежини теста. Морамо напоменути да тестови МУП-а имају више понуђених одговора са више тачних одговора, док тестови Заједнице саобраћајних школа имају више понуђених одговора са једним тачним одговором.

Аутори су мишљења да мора постојати нека форма едукације. Предлог аутора би био, да се одговарајућим изменама ЗОБС-а, обавежу сви возачи или одговарајуће категорије да слушају 10 часова теоријске наставе приликом продужавања возачке дозволе. Након одслушаних предавања возачи би полагали само теоријски део испита и то само раскрснице, основна правила саобраћаја и саобраћајне знакове. Аутори предлажу праг знања од 60%.

Капацитете за спровођење ових едукација и тестирања би требало тражити у стручним саобраћајним школама и ауто школама.

Интересантан предлог би био и начин финансирања. Уколико возачи у последње три године не би направили ни један саобраћајни прекршај, финансирање едукације и испита би сносила држава или локална самоуправа по систему “несавесни финансирају савесне”, који се већ примењује у одговарајућим ситуацијама.

У зависности од броја прекршаја и тежине прекршаја едукација и тестирање би различито коштали. На тај начин добили би још једну превентивну меру за повећање безбедности саобраћаја.

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THE COMPARATIVE ANALYSES OF DRIVER'S KNOWLEDGES WITH THE PROVISIONAL DRIVER LICENSE DEPENDING ON DRIVING ATTITUDES ACROSS TRAINING

Ivica Ristic[22], Ivana Selenic[23], Milica Cvetkovic[24]

Abstract: Driver education and training candidates is the base of which quality mainly depends what kind of driver in traffic should be after passing a driving test and getting the driver licence. In Serbia, the training of the candidates for drivers could be done by Secondary Vocational schools and Business Companies. In theoretical and practical training of candidates the result is to supplement the knowledge and improve skills , but creating the right attitude about traffic safety. The aim of the work is to perceive and analyze knowledge of drivers with the provisional driver licence, who had finished the driver's training in Business Companies as the candidates who had finished it In the Secondary Vocational schools. The comparison of knowledges will be done by survey that will be conducted on those two categories of young drivers. This work is going to introduce the comparison of the knowledges between male and female drivers 17 to 19 years of age,their attitudes linked to traffic safety and the driving skills and abilities of the drivers mentioned before. The survey was done in two towns :Vranje and Bogatic. In this research 144 drivers were included with a possession of provisional driving license. The most important and final result is that: all students who got their driving education in the public companies or similar institutions had more knowledge about traffic safety, being more conscious than the students getting their driver licenses in Secondary Vocational schools, vocational profile – traffic.

Keywords: drivers training, knowledge, traffic safety

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INTRODUCTION

Drivers education and training candidates is the base of which quality mainly depends what kind of driver in traffic should be after passing a driving test and getting the driver licence. In Serbia, the training of the candidates for drivers could be done by secondary vocational schools and business companies. In theoretical and practical training of candidates the result is to supplement the knowledge and improve skills,but creating the right attitude about traffic safety. The aim of the work is to perceive and analyze knowledge of drivers,with the provisional driver licence,who had finished the driver's training in business companies, as the candidates who had finished it in the secondary vocational schools.

Drivers who had obtained a driver's license in secondary vocational schools are educated for knowledge of the traffic rules through four years of schooling.In the second grade, students who attend the occupation – techninician of road traffic have the subject of Traffic Regulation and Safety,one year 70 hours course,two classes a week.Vocational profile Technician of Road Traffic is a four-year vocational schooling program.Students of the second grade attend a 70 hours course of Traffic Regulation and Safety and additional one week 30-hours course of Road Traffic Regulations as a part of Practical Training course. Also,students have additional 100 hours through
other courses on topics related to the traffic regulation and traffic safety.
Vocational profile Technician of Intermodal Transport is a four-year vocational schooling program.Students of the second grade attend a one week 20-hours course of Road Traffic Regulations as a part of Practical Training course and students of third grade attend a one 30-hours course of Road Traffic Regulations as a part of Practical Training course. Also, students of the second and third grade have additional 50 hours through other courses on topics related to the traffic regulations and traffic safety.

Forgetting is an active process in the human body. The level of traffic rules and regulations knowledge often decreases with the passing of a longer period of time, because some inapplicable rules are forgotten.

RESEARCH METHODS

In this research, the knowledge of traffic regulations and rules was tested between drivers who have obtained a driver's license through secondary vocational traffic schools and drivers who have obtained a driver's license in companies- driver training schools. All responders are secondary school students in the city of Vranje and Bogatic. A total of 144 drivers were tested, of which 72 were drivers who obtained a driver's license through secondary vocational schools and driver training schools.The total number of drfivers who obtain a driver's license in secondary vocational schools includes 20 female and 45 male students.The total number of drivers who obtain driver's license in driver training schools includes 34 female and 38 male students.

The research was undertaken on 16th April 2021 in Vranje and 23th April in Bogatic. Drivers who have acquired driver's licence through secondary vocational schools are students of two vocational profiles: Technician of Road Traffic and Technician of Intermodal Transport.

Drivers who have acquired a driver's license in driver training schools are mostly from Gymnasium, Secondary School of Economics, Secondary Medical School, Secondary Chemical School, Secondary Technology School and other various occupations.

Age of participans who obtained driver's license in secondary vocational schools was from 17 to 19. Of this number, 15 drivers have got 17, 41 of drivers are 18 and 16 drivers are 19 years old. Age of participans who obtained driver's license in driver training schools was from 17 to 19 years old. Of this number, 29 drivers has got 17, 33 drivers has got 18 and 10 drivers are 19 years old.

Drivers obtained driving licenses in the period from 2019 to 2021. 12 drivers obtained driver's license in 2019, 40 drivers got their license in 2020 and 20 drivers in 2021. These facts refer to vocational schools.

Drivers obtained driving licenses in the period from 2019 to2021. 5 drivers obtained driver's license in 2019, 45 drivers got their licenses in 2020 and 22 drivers in 2021. These facts refer to driver training schools.

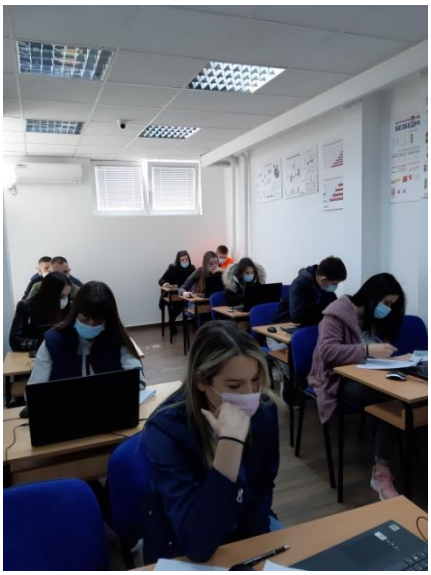
All drivers who acquired a provisional license in secondary vocational schools had the provisional driving license of "B" category. 17 drivers who got provisional license in driver training schools had the temporary license of "A1" category and 62 of them had driver's license of "B" category while 7 had provisional "A1" and "B" categories.

Drivers were not informed that testing would be done. They were informed that they should come to do survey for scientific work.

All participants have done a test consisted of two parts. In the first part, the respondents solved a theoretical test about knowing the traffic rules used in secondary vocational schools and published by The Association of Traffic Schools – Republic of Serbia.Printed copies of tests were used for testing. In the second part the theoretical test,printed copies are used for testing (simulations of the theoretical exam) that are used for taking the exam in driver training schools. This test is solved by computers. Each respondent has done a different test. The Association of Traffic Schools' tests of the Republic of Serbia have a total of 50 questions divided into five areas. The maximum number of points per test was 110. There were 10 questions in each area, of which:

- The first area consisted of traffic situation in the pictures that carried 2 and 3 points.
- The second area consisted of "theoretical questions" and this area was connected with expressions, terms, the traffic rules and carried from 1 to 3.
- The third area was related to traffic signs definitions that carried 2 points each.
- The fourth area consisted of two intersections, 4 points each and also additional signs, road markings, signs given by persons authorized to manage traffic carrying from1 to 3 points.
- The fifth area consisted of "theoretical questions" related to the deprivation of the driver's licenses, exemption of vehicles and drivers, technical inspection, which carried 1 and 2 points.

Tests used in driver training schools are official tests of the Ministry of Interior of the Republic of Serbia and they have a total of 41 questions divided into 9 areas. The maximum number of points was one hundred.



Picture 1. Test display

Drivers also filled in a questionnaire that was anonymous. It was filled in by 144 respondents, who are listed in the previous section.The survey contained the following 10 questions:

11. Gender?
12. Age?
13. Date of obtaining provisional driver's licence?
14. School and occupation?
15. Provisional driving licence category?
16. Name of the company where you have passed the driving test?
17. Have you ever had any traffic violations since you have obtained your provisional driver's license?
18. If you had traffic violations, specify the type?
19. Have you ever had a car accident as a motor vehicle driver, from the moment you have got a provisional driver's license?
20. If you had a traffic accident as a motor vehicle driver, were you responsible for the accident?

There were offered answers in questions 5, 7, 9 and 10.

The limiting factor of this research was that due to the complex epidemiological situation in the country, only one driver training school was selected with the highest pass rate in the theoretical part of the exam. There is a passing rate of over 90% in the theoretical part of the exam in this school.

THE RESULTS OF THE RESEARCHES

The following table 1 shows the comparative results about theoretical part of testing according to The Association of Traffic Schools. The results are shown in tables for drivers who obtained a driver's license in a vocational school and for drivers who obtained a driver's license in driver training school, first for all of them as well as the results depending on gender of drivers.

An interesting fact is that if you look at the test from The Association of Traffic Schools and if you consider today's passing the theoretical part of the driving test of 85%, of a total of 144 participants the test would pass 26 or 18, 05%. Of which 15 participants or 25, 83% of the drivers group who got the drivers' license in vocational school and 11 or 15, 28% drivers who got the driver's license in driver training school.

Observing all these facts, drivers who have obtained driver's license in vocational schools have better results compared to drivers who have obtained a driver's license in driver training schools. The researchers were surprised by this result because they have expected higher passability and better results for drivers from the secondary vocational schools. The differnce is only 5,55%.

From drivers who have obtained a driver's license in secondary vocational schools, observing the test of The Association of Traffic Schools, the driver who achieved the highest number of points was with 106 points, while the driver with 47 points had the lowest number of points. The lowest number of points for drivers from driver training school was 48, and the maximum was 109 points.

Table 1. Tabular presentation , the theoretical part results,testing based on the test of The Association of Traffic Schools

Drivers of secondary vocational school						
	women		man		in total	
	correct (%)	incorrect (%)	correct (%)	incorrect (%)	correct (%)	incorrect (%)
I area	78,67	21,33	81,42	17,69	80,39	19,61
II area	76,64	23,36	79,49	20,51	78,42	21,58
III area	73,70	26,30	73,33	26,27	**73,47**	**26,53**
IV area	77,47	22,53	71,48	28,52	73,73	26,27
V area	61,73	38,27	60,15	39,95	60,74	39,26
In total					**74,63**	**25,37**
Drivers of the driver training school						
	women		man		in total	
	correct (%)	incorrect (%)	correct (%)	incorrect (%)	correct (%)	incorrect (%)
I area	83,35	19,65	79,52	20,48	79,92	20,08
II area	75,75	24,25	70,15	29,85	72,84	27,16
III area	78,26	21,74	80,40	19,60	**79,38**	**20,63**

IV area	72,64	27,36	69,50	30,50	71,01	28,99
V area	72,46	27,54	65,33	34,67	68,75	31,25
In total					**74,68**	**25,32**

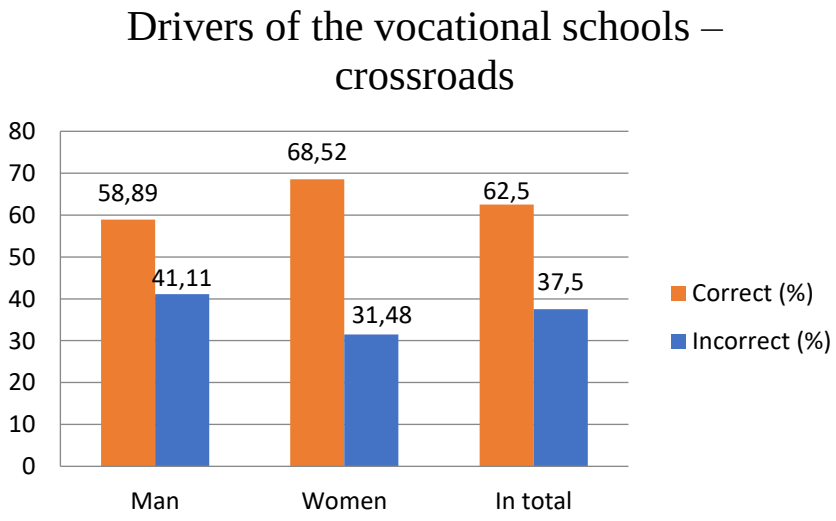
If we look at the total results, we see that drivers who obtained driver's license in secondary vocational schools have 74, 63% accurate answers and 25, 37 incorrect answers. Drivers who obtained temporary driver's license in driver training school have 74, 68% accurate answers and 25, 32% incorrect answers. Drivers from the secondary vocational schools were just a bit more successful for 0,05%.

When we compare drivers from the vocational schools, women were better than men in the third, fourth and fifth area. Men were better in the remaining two areas.

When drivers from driver training schools are compared, women have achieved better results than men in the first,second, fourth and fifth area. Men were better in the third area.

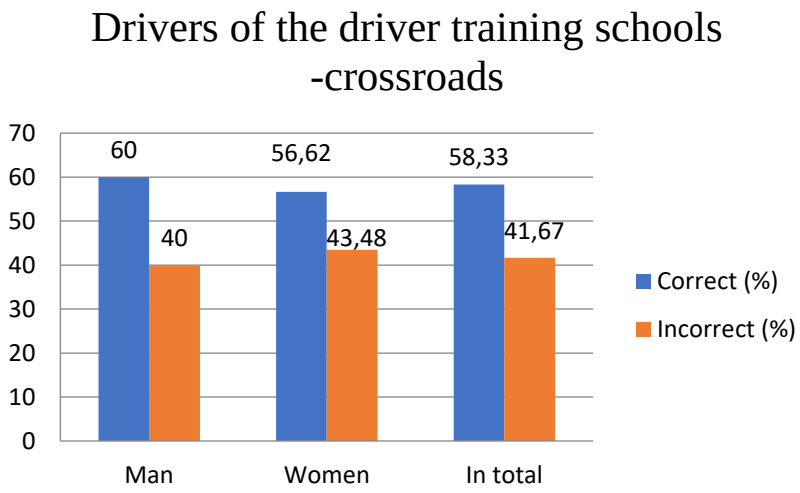
The following fact is especially emphasized, drivers from the secondary schools failed 25,53% of questions regarding traffic signs. Drivers from the driver trainig schools failed at 20,63% . Drivers from the secondary vocational schools didn't know the meaning of every fourth traffic sign.

The following two graphs-picture 2 and picture 3 are showing the test results of the participants solving the crossroads. They had to solve a total of 288 crossroads i.e. each participant two. The results are presented separately for women and men in total.



Picture 2. Graphic presentation of successfully solved crossroads – drivers of the vocational school

There were 62,50% correctly solved crossroads and 37,5% incorrect. Women had 68,52% correct answers and men 58,89%. The women were better by 9,63%.



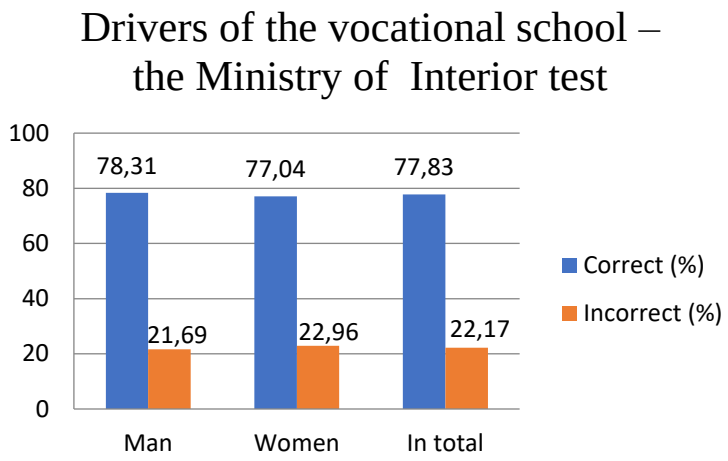
Picture 3. Graphic presentation of successfully solved crossroads – drivers of the driver training school

It was 58,33% correctly solved crossroads and 41,67% incorrect. Women had 56,62% correct answers and men 60%.The men were better by 3,38%.It has to be said that drivers of the secondary vocational schools acheived better results at crossroads.The most worrying result is that drivers from secondary vocational schools did not solve 37,50% of crossroads, and drivers from driver training schools did not solve 41,67% of crossroads, the situations in which they find themselves every day.

The following two graphs show the results of the theoretical testing based on the test by the Ministry of the Interior. The results are shown graphically in pictures 4 and 5 for drivers who have obtained driver's license in professional schools and for drivers who have obtained driver's license in driver training schools. The results are shown separately for women and men, and together in total.

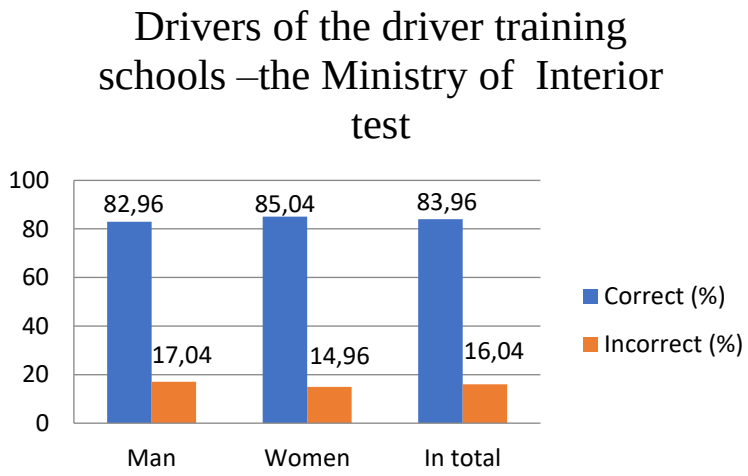
An interesting fact is that, if you look at the test of Ministry of the Interior and if we consider the level of passing on the theoretical test of driving test from about 85%, of the total of 144 respondents , the exam would pass 56 drivers, i.e. 38,89% and that would be 20, i.e. 27,78% from the group who acquired driving licence in vocational schools and 36 or 50,00% of those who have acquired driving license in driver training schools. Observing these facts, the drivers who acquired driver's license in driver training schools have better results compared to drivers who acquired driver's license in vocational schools.The researchers were surprised by this result because they have expected higher passing rate and better results of drivers from vocational school. The difference is as much as 22,22%.

From drivers who have obtained a driver's license in secondary vocational schools and considering the Ministry of the Interior tests, the highest number of points achieved by a participant was 98 points, while the lowest number of points achieved by a participant was 52. The lowest number of points for participants from driver training school was 56, and maximum was 99 points.



Picture 4. Graphic presentation, the success of testing, the Ministry of Interior test-drivers of the vocational school

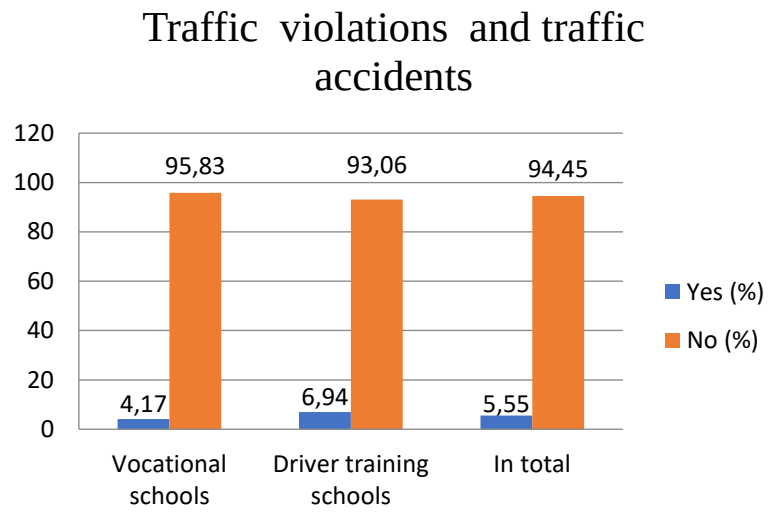
It was 77,83% correct answers and 22,17% incorrect. Women had 77,04% correct answers and men 78,31%. The men were better for 1,27% . These results refer to vocational schools.



Picture 5. Graphic presentation, the success of testing, the Ministry of Interior test-drivers of the driver training schools

It was 83,96% correct answers and 16,04% incorrect.Women had 85,04% correct answers,men82,96%. The women were better for 2,08%.These results refer to driver training schools.

Observing both tests, it can be seen that both categories of drivers showed better results on the Ministry of Interior test. The difference is as much as 20,84%. The reasons should be looked for in concept of the test or in the difficulties of the test. We have to mention that the Ministry of Interior tests has multiple choice answers with more correct answers, while the Association of Traffic Schools tests have multiple choice answers with one correct answer.



Picture 6. Graphic presentation of traffic violations and traffic accidents

Considering the number of traffic violations, picture 6 shows that drivers from secondary vocational schools had 3 violations or 4, 17%. Drivers of driver training schools had 5 violations or 6, 94%. Drivers from the secondary vocational schools had a smaller number of violations for 2, 77%.

Observing the number of traffic accidents, we see the drivers from the secondary vocational schools had 3 accidents or 4, 17%. Drivers of the driver training schools had 5 accidents or 6, 94%. Drivers of the secondary vocational schools had a smaller number of accidents for 2, 77%. Observing traffic accidents on the basis of a survey questionnaire, drivers from vocational schools were not responsible for traffic accidents. Drivers of the driver training schools were the cause of two accidents, i.e. 40% of all traffic accidents.

CONCLUSION

The limitation of this research is that these are small samples of participants and that applied statistical method does not provide sufficient data on weather the achieved differences by two groups of drivers are result of chance or systemic operation of independent variables. The limiting factor of this research is also a complex epidemiological situation in the country and because of that one driver training school was chosen with the highest passing on the theoretical part of the exam. In this school the passing rate is over 90%.

Observing the test of The Association of Traffic Schools and if we consider today's passing limit at theoretical driving test of 85%, out of a total 144 respondents, 26 or 18, 5 of them would pass the exam, 15 or 20, 83% from the drivers group who obtained a driver's license in vocational schools and 11 or 15, 28% who obtained a driver's license in driver training schools.

If the test of The Ministry of Interior is observed and if we consider today's passing limit at theoretical driving test of 85% out of a total of 144 respondents,56 or 38,89% would pass the exam and 20 or 27,78% from the drivers group who obtained driver's license in vocational schools and 36 or 50% of those who obtained driver's license in driver training schools.

By analyzing both tests (The Ministry of Interior and The Association of Traffic Schools) and if we consider today's passing limit on the theoretical part of driving test of 85%, the theoretical exam would be passed by 28,47 of drivers.

Comparing both test, drivers who obtained a driver's license in driver training schools were better than drivers who obtained a driver's license in secondary vocational schools by 8,33%. This result was a surprise

for the researchers considering much larger number of classes in vocational schools than in driver training schools. In addition, in the most vocational courses in secondary traffic schools we have areas that include traffic regulations.

Drivers from secondary vocational schools made a mistakes in 25, 53% of traffic signs. Drivers from driver training schools were wrong of 20, 63% of traffic signs. A worrying result is that drivers from the secondary vocational schools didn't know the meaning of every fourth sign.

A worrying result is that drivers from secondary vocational schools didn't solve 37, 50% of the crossroads, and drivers from driver training school didn't solve 41, 67% of the crossroads, these are the situations in which they find themselves every day.

Looking at both tests, it can be seen that both categories of drivers showed better results on a test by The Ministry of Interior. The difference is 20, 84% the reasons should be sought in the concept of the test or in the difficulty of the test. We must mention that The Ministry of Interior tests have multiple choice answers with more correct answers, while The Association of Traffic School tests have multiple choice answers too, but one correct answer.

The authors think that it has to be some form of education. Author's proposal would be to make appropriate changes to The Traffic Safety Law and all drivers or appropriate categories to listen 10 hours of theoretical classes during driving license extension. After listening to the lectures, drivers would take the exam, only the theoretical part of exam and only regarding the crossroads, basic traffic rules and traffic signs. The authors propose the knowledge level of 60%.

Capacities for doing these training and tests should be realized in vocational traffic schools and driver training schools.

An interesting suggestion would be the way of financing. If drivers would not have committed a single traffic violation in the last three years, financing of education and exams should be by the state or local government according to the system "conscienceless finance conscientious "that is already applied in appropriate situations. Depending on the number and seriousness of violations, education and testing would cost differently. That way, we would get another preventive for increasing traffic safety.

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ŠKOLA ZA CESTOVNI PROMET
ZAGREB, TRG J. F. KENNEDYJA 8

Sanja Tirić, dipl. ing. – prof. savjetnik
Lovorka Vidić, dipl. ing. – prof. savjetnik

EU projekt „Good Practice on the Move“ - Usavršavanja nastavnika na Međunarodnim seminarima u Parizu (Francuska) i Poznańu (Poljska)

Sažetak:

Škola za cestovni promet iz Zagreba sudjelovala je kao partner u EU-projektu „Good Practice on the Move“.

Cilj projekta, čiji je nositelj BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH iz Berlina, bio je ukazati na perspektivu za uspješnu integraciju digitalizacije i inovativnih tehnologija u strukovnom obrazovanju i osposobljavanju na primjeru automobilskog sektora.

Tijekom projekta, sudionici – nastavnici iz srednjih strukovnih škola, sa sveučilišta i iz udruga, su na međunarodnim skupovima u Berlinu, Vicenzi, Zagrebu i Vilniusu te na dva stručna usavršavanja, u Parizu i Poznańu, razmjenjivali iskustva i primjere dobre prakse iz svojih institucija, prenosili znanja i inovativne modele učenja i digitalnih sadržaja u području elektromobilnosti i telematike motornih vozila u strukovnom obrazovanju i osposobljavanju i akademskom obrazovanju.

Ključne riječi:

- Digitalizacija i alati za učenje u strukovnom obrazovanju
- Elektromobilnost
- Telematika u motornim vozilima

EU projekt „Good Practice on the Move“ – Usavršavanja nastavnika na Međunarodnim seminarima u Parizu (Francuska) i Poznańu (Poljska)

1. O projektu

Nositelj projekta „Good Practice on the Move“ bio je BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH iz Berlina. Osnovna ideja projekta bila je uspostaviti strateško partnerstvo koje bi uključilo ustanove za strukovno obrazovanje i visoko školstvo kako bi se razmijenili modeli dobre prakse, digitalne tehnološke inovacije u strukovnom obrazovanju te ojačale veze između strukovnog obrazovanja u području prometa, logistike i automobilske industrije.

Cilj projekta bio je ukazati na perspektivu za uspješnu integraciju digitalizacije i inovativnih tehnologija u strukovnom obrazovanju i osposobljavanju na primjeru automobilskog sektora.

Projekt „Good Practice on the Move“ je započeo 1. listopada 2018. i trebao završiti 31. listopada 2020., ali je zbog nemogućnosti realizacije planiranih sadržaja zbog pandemije izazvane corona virusom, službeno završio 31. kolovoza 2021. godine.

2. Partneri na projektu

Partneri na projektu bile su strukovne škole, sveučilišta i udruge iz sedam zemalja EU koje su predstavile svoje primjere dobre prakse, ispitivale održivost i iskoristivost istih kako bi se primijenili i u ostalim državama EU.

Partneri na projektu bili su: Innung des Kraftfahrzeuggewerbes Berlin, Hochschule für Technik und Wirtschaft Berlin, Association Nationale pour la Formation Automobile iz Sèvres Cedexa, Francuska, Pia Società San Gaetano iz Vicenze, Italija, Vilniaus Automechanikos Ir Verslo Mokykla iz Vilniusa, Litva, Siegfried Marcus Berufsschule – Berufsschule für Kraftfahrzeugtechnik iz Beča, Austrija, Zespoł Szkoł Samochodowych im. Tadeusza Tańskiego iz Poznańa, Poljska, Politechnika Poznańska iz Poznańa, Poljska i Škola za cestovni promet iz Zagreba, Hrvatska.

Tijekom projekta, sudionici – nastavnici iz srednjih strukovnih škola, sa sveučilišta i iz udruga, su na međunarodnim skupovima i stručnim usavršavanjima razmjenjivali iskustva i primjere dobre prakse iz svojih institucija, planirali aktivnosti u okviru projekta, donosili zaključke i smjernice za daljnji rad i usavršavanja kako bi se, primjenjujući nove tehnologije i nove alate za poučavanje, povećala kvaliteta i obim znanja te strukovna zanimanja postala privlačnija mladima koji bi kao kvalificirani radnici postali traženi na tržištu rada.

Održana su 4 međunarodna skupa: u Berlinu, Vicenzi, Zagrebu i Vilniusu i 2 stručna usavršavanja: u Parizu i Poznańu.

Međunarodni skup u Beču i završni sastanak u Berlinu nisu održani zbog nemogućnosti realizacije (razlog: nepovoljna epidemiološka situacija).

3. Međunarodni seminari

1. Međunarodni seminar u Parizu od 25. do 28. studenog 2019. godine

U sklopu projekta „Good Practice on the Move“ u studenom 2019.godine održano je stručno usavršavanje partnera s projekta u Parizu. Školu za cestovni promet iz Hrvatske predstavljale su Maja Balenović i Sanja Tirić.

Slika 1 - partneri na projektu GPOM

Domaćin seminara bila je stručna organizacija **ANFA - Association Nationale pour la Formation Automobile** koja je organizirala posjet kampusu **Campus des services de l’automobile et de la mobilité** i srednjoj strukovnoj školi **GARAC – École nationale des professions de l’automobile**.

Slika 2 - predavanja u ANFA-i

ANFA - Association Nationale pour la Formation Automobile je nacionalno udruženje za obuku u autoindustriji, zaduženo za provedbu mjera koje spadaju u nacionalnu politiku osposobljavanja školovanja u Francuskoj. U svom radu bavi se integracijom mladih u tržište rada, osposobljavanjem radnika tijekom promjena u tehnološkim procesima te podržavanjem profesionalnih karijera kroz sustave početnog i kontinuiranog usavršavanja u autoindustriji. **ANFA** se financira porezom za razvoj stručnog usavršavanja u zanimanjima za održavanje automobila, popravak bicikala i motocikala. koji poslodavci izdvajaju u državni proračun.

Campus des services de l'automobile et de la mobilité je sveučilišni kampus koji nudi razne obuke, od usavršavanja u specijalističkim zvanjima do diplome inženjera u svim područjima trgovine i održavanja automobila, motocikala i bicikala. U sklopu kampusa, koji se prostire na 1.900 m^2 nalazi se i 13 radionica mehanike i tehnologije za automobile, motocikle i bicikle, računalne učionice i laboratoriji za fiziku u kojima se provodi obrazovanje mladih kao i stručno usavršavanje radnika kojima je potrebno daljnje usavršavanje.

Slika 3 - kampus

Slika 4 - GARAC

GARAC – École nationale des professions de l'automobile, nacionalna srednja škola obrazuje učenike za zanimanja u autoindustriji te ih priprema za suočavanje s tehnološkim i komercijalnim izazovima u industriji **automobila, motocikala, teretnih vozila i logistike.**

2. Međunarodni seminar u Poznanu od 16. do 20. kolovoza 2021. godine

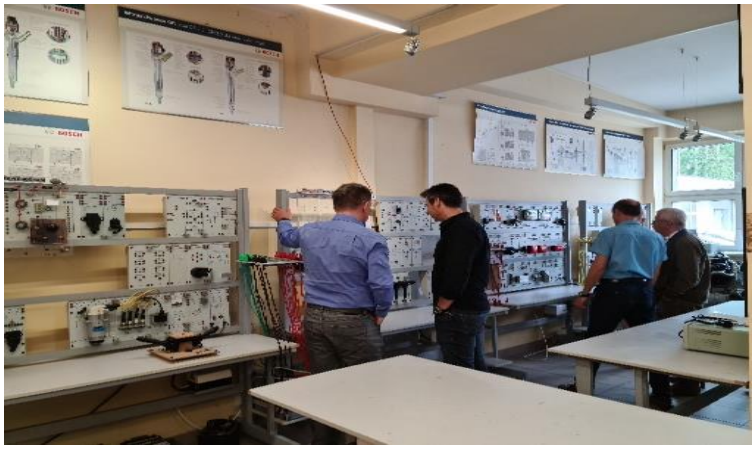
Stručnom usavršavanju u Poznanu nazočili su partneri – nastavnici iz Njemačke, Litve, Poljske i Hrvatske (Maja Balenović, Snježana Kovač, Sanja Tirić i Lovorka Vidić iz Škole za cestovni promet u Zagrebu).

Posjetili su i razgledali: **Zespoł Szkoł Samochodowych im. Inž. Tadeusza Tańskiego** (Srednja tehnička strukovna škola), **PUT – Politechnika Poznanska** (Tehničko sveučilište u Poznanu) i **Školu Best Driver** (Škola za poboljšanje vozačkih tehnika).

Zespoł Szkoł Samochodowych im. Inž. Tadeusza Tańskiego je Srednja tehnička strukovna škola u kojoj se učenici obrazuju za zanimanja: tehničar, automehaničar, elektromehaničar i vozač mehaničar. U školskoj radionici i servisnoj stanici, koje su opremljene potrebnim alatima, uređajima i strojevima, učenici pregledavaju, održavaju i popravljaju vozila te obavljaju tehničke preglede na vozilima do 3,5 t. U učionici za praktičnu nastavu učenici koriste simulatore kako bi dijagnosticirali kvarove na pojedinim sklopovima vozila, obučavaju se raznim tehnologijama obrade materijala, zavaruju,…

Slika 5 - servisna stanica

Slika 6 – praktikum



Slika 7 - učionica za praktičnu nastavu

PUT – Politechnika Poznanska jedno je od najboljih tehničkih sveučilišta u Poljskoj. Sastoji se od 9 fakulteta među kojima su Fakulteti računalstva, elektrotehnike, elektronike i telekomunikacija, strojarstva, inženjerski menadžment i zaštita okoliša, u kojima studenti stječu znanja i sudjeluju u naprednim inženjerskim istraživanjima.

Slika 8 - ispred zgrade Rektorata

U sklopu sveučilišnog kampusa nalaze se i Centri za obuku vozača i pilota.

U **Centru za obuku pilota** omogućili su nam da u avio-simulatoru pokušamo upravljati zrakoplovom („uzlijetali“ smo sa pista iz željenih zračnih luka, “letjeli“ u svim vremenskim uvjetima i malo teže se (neuspješno) “prizemljili“).

Slika 9 - u avio-simulatoru

U **Centru za obuku vozača** upravljali smo vozilom u auto-simulatoru gdje smo „vozili“ u različitim vremenskim i klimatskim uvjetima, na različitim vrstama i nagibima cesta, opterećena i neopterećena vozila.

Slika 10 - auto-simulator

Slika 11 - vožnja u auto-simulatoru

Nastavnici, sudionici na projektu, su razgledali i **PUT Motorsport** - laboratorije i prostorije u kojima studenti, budući inženjeri, u okviru projekta Formula Student, konstruiraju trkaće automobile. Tim od 35 studenata Tehničkog sveučilišta u Poznanu, podijeljen u skupine koje se bave: konstrukcijom motora, nosivom konstrukcijom, sustavom za ovjes, aerodinamikom, elektronikom i marketingom, sudjeluje na međunarodnim natjecanjima mladih inženjera na kojima postižu značajne rezultate.

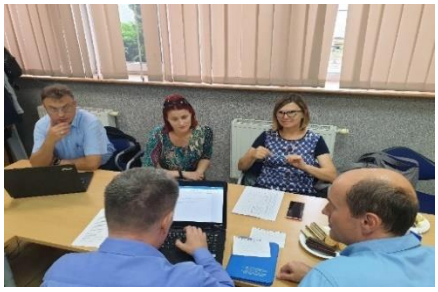
Slika 12 - student u trkaćem automobilu konstruiranom na PUT-u

U **Školi Best Driver,** koja omogućava vozačima da steknu potrebna znanja i vještine, pohađajući tečajeve na kojima jedinstvenom metodologijom rada – poučavanja: surađujući s najprestižnijim transportnim tvrtkama u Poljskoj i stažiranju na međunarodnim linijama u zapadnoj Europi, obučavaju vozače, teorijski i praktično, kako poboljšati tehnike vožnje, EKO i obrambenu vožnju, kako sigurno učvrstiti teret, rukovati poluprikolicama te koristiti telematske uređaje i tahograf. Instruktor, jedan od samo 6 licenciranih za obuku poboljšanja tehnike vožnje na DAF-ovim teretnim vozilima u Poljskoj, nam je demonstrirao poučavanje na najmodernijem simulatoru vožnje na čijem se usavršavanju i ispitivanjima još radi.

Slika 13 - instruktor u simulatoru vožnje

Nakon posjeta i razgledavanja obrazovnih institucija i njihovih učionica za praktičnu nastavu i laboratorija, na radnim sastancima se raspravljalo i davalo primjere iz svojih institucija o: implementaciji novih nastavnih sadržaja, iskustvima pri korištenju različitih digitalnih platformi, načinu rada (poteškoćama i prednostima) tijekom nastave na daljinu zbog pandemije izazvane corona virusom COVID - 19, obučavanju i osposobljavanju učenika i nastavnika za rad s novim tehnologijama, opremljenosti škola nastavnim sredstvima i pomagalima,

opremljenosti učionica za praktičnu nastavu, financiranju opreme i edukacija nastavnika, kompetencijama učenika nakon završene srednje strukovne škole i mogućnostima njihovog uključivanja na tržište rada ili nastavka obrazovanja.



Slike 14, 15, 16 - radni sastanak

4. Zaključak

Sudjelovanje i rad na EU projektu „Good Practice on the Move“, tijekom kojeg su se razmjenjivala znanja i iskustva između partnera na projektu i omogućili širenje, prijenos i usavršavanje inovativnih modela učenja o digitalnim sadržajima i novim tehnologijama u strukovnom obrazovanju i osposobljavanju u EU u području informacijskih i telekomunikacijskih tehnologija, sigurno će doprinijeti poboljšanju kvalitete i povećanju atraktivnosti strukovnog obrazovanja i osposobljavanja u području prometa, logistike i automobilske industrije.

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ŠKOLA ZA CESTOVNI PROMET

ZAGREB, TRG J. F. KENNEDYJA 8

Sanja Tirić, Graduate Eng. – prof. Adviser
Lovorka Vidić, Graduate Eng. – prof. Adviser

EU project "Good Practice on the Move" - Learning Activities (professional trainings) for the teachers at International seminars in Paris (France) and Poznań (Poland)

Abstract:

The Road Traffic School from Zagreb participated as a partner in the EU project " Good Practice on the Move ".

The aim of the project, led by Berliner Gesellschaft für Internationale Zusammenarbeit mbH from Berlin (BGZ), was to point out the perspective for the successful integration of digitalisation and innovative technologies in vocational education and training on the example of the automotive sector.

During the project, the participants - teachers from secondary vocational schools, the universities and the associations were at International Meetings in Berlin, Vicenza, Zagreb and Vilnius and at two professional trainings (Learning Activities) in Paris and Poznan. There, they exchanged experiences and good practices from their institutions, transferred knowledge and innovative models of learning and digital contents in the field of electromobility and telematics of motor vehicles in vocational education and training and academic education.

Keywords:

- Digitization and learning tools in vocational education
- Electromobility
- Telematics in motor vehicles

EU project "Good Practice on the Move" - Learning Activities (professional trainings) for the teachers at International seminars in Paris (France) and Poznań (Poland)

1) About the project

The holder of the project "Good Practice on the Move" was BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH from Berlin. The basic idea of the project was to establish a strategic partnership involving vocational education and higher education institutions to exchange models of good practice, digital technological innovations in

vocational education and strengthen links between vocational education in transport, logistics and the automotive industry.

The aim of the project was to point out the perspective for the successful integration of digitalization and innovative technologies in vocational education and training on the example of the automotive sector.

The project "Good Practice on the Move" started on 1st October 2018. and was supposed to end on 31st October 2020., but due to the impossibility of realization of the planned contents because of the corona virus pandemic, it officially ended on 31st August 2021

2) Project partners

The project partners were vocational schools, universities and associations from seven EU countries, which presented their examples of good practice, examined their sustainability and usability in order to be applied in other EU countries.

Project partners were: Innung des Kraftfahrzeuggewerbes Berlin, Hochschule für Technik und Wirtschaft Berlin, Association Nationale pour la Formation Automobile from Sèvres Cedex,

France, Pia Società San Gaetano from Vicenza, Italy, Vilniaus Automechanikos Ir Verslo Mokykla from Sienigried, Litnius, Litnia Marcus Berufsschule - Berufsschule für Kraftfahrzeugtechnik from Vienna, Austria, Zespoł Szkoł Samochodowych im. Tadeusza Tańskiego from Poznań, Poland, Politechnika Poznańska from Poznań, Poland and

Road Traffic School from Zagreb, Croatia.

During the project, participants - teachers from secondary vocational schools, universities and associations, exchanged experiences and examples of good practice from their institutions at

international conferences and professional trainings, planned project activities, made conclusions and guidelines for further work and training. Applying new technologies and new teaching tools would increase the quality and scope of knowledge and vocational occupations to become more attractive to young people who would become in demand in the labor market as skilled workers.

The International conferences were held in Berlin, Vicenza, Zagreb and Vilnius and the Learning Activities (professional trainings) were in Paris and Poznań.

The International meeting in Vienna and the Final meeting in Berlin were not held due to the impossibility of realization (reason: unfavorable epidemiological situation)).

3) International seminars

1) International Seminar in Paris from 25th to 28th November 2019.

As part of the project "Good Practice on the Move", in November of 2019, a professional training for project partners was held in Paris. School of Road Traffic from Croatia was represented by Maja Balenović and Sanja Tirić.

Figure 15 – GPOM project partners

The seminar was hosted by **ANFA - Association Nationale pour la Formation Automobile**, which organized a visit to the **Campus des services de l'automobile et de la mobilité** and the secondary vocational school **GARAC – École nationale des professions de l'automobile**.

Figure 16 – lectures in ANFA

ANFA - Association Nationale pour la Formation Automobile is a national association for education in the automotive industry, which is in charge of implementation of measures that fall within the national policy for training education in France. The association work focuses on integration of young people into the labour market, training worker during changes in technological processes and supporting professional careers through systems of initial and continuous training in the Automotive industry. **ANFA** is financed by the means of taxation of employers for further exceeding of professional development in the professions of car maintenance, repair of bicycles and motorcycles which employers allocate to the state budget.

Figure 17 - campus

Campus des services de l'automobile et de la mobilité is a university campus that offers a variety of training, from specialist training to a degree in engineering in all areas of trade and maintenance of cars, motorcycles and bicycles. Within the campus, which covers 1,900 m^2, there are 13 mechanics and technology workshops for cars, motorcycles and bicycles, computer classrooms and physics laboratories in which youth education and professional training of workers who need further training is conducted.

Figure 18 - GARAC

GARAC – École nationale des professions de l'automobile is a national high school that educates students for occupations in the automotive industry and prepares them to face technological and commercial challenges in the automotive, motorcycle, truck and logistics industries.

2) International Seminar in Poznan from 16th to 20th August 2021.

The professional training in Poznan was attended by partners - teachers from Germany, Lithuania, Poland and Croatia (Maja Balenović, Snježana Kovač, Sanja Tirić and Lovorka Vidić from the School of Road Traffic in Zagreb), who visited: **Zespoł Szkoł Samochodowych im. Eng. Tadeusza Tańskiego** (Secondary Technical Vocational School), **PUT - Politechnika Poznańska** (Technical University of Poznan) and **Best Driver School** (School for the Improvement of Driving Techniques).

Zespoł Szkoł Samochodowych im. Eng. Tadeusza Tańskiego is the Secondary Technical Vocational School where students are educated for the professions: technician, car mechanic, electromechanics and driver mechanic. In the school workshop and service station, which are equipped with the necessary tools, devices and machines, students inspect, maintain and repair vehicles and perform technical inspections on vehicles up to 3.5 t. In the classroom for practical works, the students use simulators to diagnose failures on individual vehicle assemblies, they are trained in various

Figure 19 – School workshop

materials processing technologies, they weld…

Figure 20 – praktikum

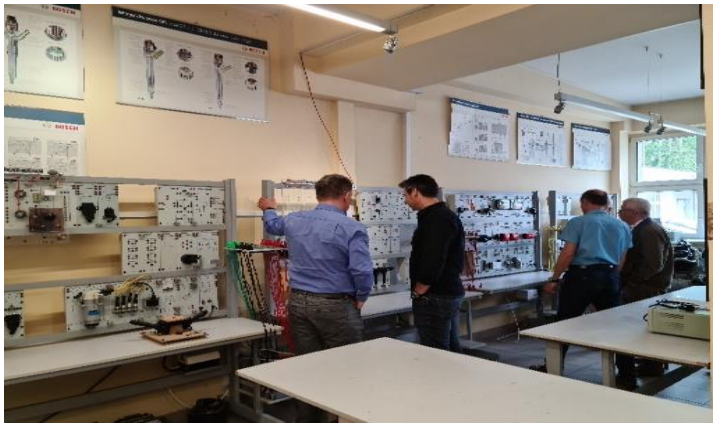

Figure 21 – classroom for practical classes

PUT - Politechnika Poznanska is one of the best technical universities in Poland. It consists of 9 faculties, including the Faculties of Computer Science, Electrical Engineering, Electronics and Telecommunications, Mechanical Engineering, Engineering Management and

Environmental Protection, in which students acquire knowledge and participate in advanced engineering research.

Figure 22 - in front of the Rectorate building

There are also Driver and Pilot Training Centres on the university campus.

At the **Pilot Training Centre**, we were able to try to control the aircraft in the flight simulator (we "took off" from the runway from the desired airports, "flew" in all weather conditions and a little harder (unsuccessfully) "landed").

Figure 23 – inside of the Aero simulator

At the **Driver Training Centre**, we drove a vehicle in a car simulator where we "drove" in different weather and climatic conditions, on different types and slopes of roads, loaded and unloaded vehicles.

Figure 24 – automobile simulator

Figure 25 – driving in automobile simulator

The teachers, project partners, visited also **PUT Motorsport** - laboratories and classrooms where the students, future engineers, within the Formula Student project, construct race cars. A team of 35 students from the Technical University of Poznań, divided into groups dealing with: engine construction, load-bearing structure, suspension system, aerodynamics, electronics and marketing, participates in international competitions for young engineers where they achieve significant results

Figure 26 - student in a racing car constructed on PUT

At the **Best Driver School**, which enables drivers to acquire the necessary knowledge and skills, attending courses where they use a unique methodology of work – teaching; working with the most prestigious transport companies in Poland and internships on international routes in Western Europe; they train drivers, theoretically and practically, how to improve driving techniques, ECO and defensive driving, how to securely fasten a load, handle semi-trailers and use telematics devices and a tachograph. The instructor, one of only 6 licensed to train driving technique improvement training on DAF trucks in Poland, demonstrated to us the teaching on the most modern driving simulator which is still being improved and tested.

Figure 27 - instruktor in automobile simulator

After visiting the educational institutions and their classrooms for practical classes and laboratories, the teachers discussed and gave examples from their institutions about: the implementation of new teaching contents, the experiences in using different digital platforms, how to work (difficulties and advantages) during the classes at distance caused by coronavirus COVID - 19, the trainings of students and teachers to work with new technologies, the equipping schools with teaching aids, the equipping classrooms for practical classes, the financing of equipment and teacher education, the student competencies after high school and the opportunities of their inclusion in the labour market or continuing education.



Figures 28, 15, 16 – work meeting

4. Conclusion

The participation and the work on the EU project "Good Practice on the Move", during which knowledge and experience were exchanged between project partners, and enabled the dissemination, transfer and improvement of innovative models of learning about digital content and new technologies in vocational education and training in the EU in the field of information and telecommunications technologies, will

certainly contribute to improving the quality and increasing the attractiveness of vocational education and training in the field of transport, logistics and the automotive industry.

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Strokovni izobraževalni center Ljubljana

VPLIV EPIDEMIJE COVID-19 NA PROMET

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POVZETEK

Promet je močno povezan s prebivalstvom. Če ne bi bilo prometa, se tudi človek ne bi mogel gibati iz kraja v kraj. S svojim premikanjem ustvarja nove prometne storitve in druge dejavnosti ter tako vpliva na nacionalno gospodarstvo.

Pojav novega koronavirusa močno vpliva na odvijanje prometa, predvsem potniškega prometa, in na same pogoje življenja. Epidemija COVID-19 ima močan vpliv na svetovno ekonomijo in na ekonomijo v Sloveniji.

Ključne besede: epidemija, COVID-19, promet

1.UVOD

Promet je panoga, ki je močno povezana z nacionalnim gospodarstvom. Vpliva na družbeno delitev dela, kar se odraža v strukturi gospodarstva, predvsem na regionalnem gospodarskem razvoju posamezne države. V svoji proizvodnji ustvarja prometne storitve.

Zaradi virusa, ki se je pojavil, so se močno spremenili pogoji poslovanja tudi v prometu in povzročili škodo svetovni ekonomiji. Novi koronavirus je prerasel v pandemijo in se razširil čez večino sveta, pri tem pa je močno vplival na gospodarstvo in pogoje življenja.

2.PROMET

V teoriji in praksi se na področju prometa pogosto srečujemo z različnimi termini, kot so prevoz, transport, promet, komunikacija …

Teoretiki opredeljujejo pojem promet iz različnih vidikov, ki imajo vsebinsko različne pomene. Pojem promet je predstavljen kot ekonomski termin, npr. denarni promet, blagovni promet. V logistiki pojem promet obsega prenos ljudi, stvari, informacij, denarja in energije iz enega mesta na drugo. Poleg tega pa zajema operacije v zvezi s prevozom blaga, potnikov in komunikacije.

Promet je sistem, ki je sestavljen iz podsistemov oz. prometnih panog, ki jih vrednotimo z enotnimi merili, kjer obravnavamo tehnični, tehnološki, organizacijski, ekonomski in pravni vidik.

Tehnični vidik predstavlja osnovni sloj, sestavljajo pa ga:
- transportna sredstva, s pomočjo katerih se opravljajo transportne operacije;
- poti, po katerih se gibljejo transportna sredstva;
- prometna vozlišča, v katerih se opravljajo začetno – končne pretovorne operacije;
- prometna infrastruktura.

Tehnološki vidik predstavlja osnovni proces za proizvodnjo prometnih storitev. Zajema tri faze, in sicer (Medeot, 2005):
- tehnologijo priprave prevoza,
- tehnologijo izvedbe prevoza,
- tehnologijo zaključevanja prevoza.

V tehnologiji priprave prevoza se pripravi prevozna sredstva, osebje, ki bo prevoz opravilo, in vsa ostala dela organizacije. Tehnologija izvedbe prevoza zajema vse operacije od trenutka natovarjanja tovora v prevozno sredstvo do trenutka predaje in raztovarjanja tovora. V tehnologiji zaključevanja prevoza se obračunajo stroški, rešujejo morebitne reklamacije in analizira se celoten transportni proces.

Organizacijski vidik se nanaša na zakonitosti, znanja, sposobnosti, organizacijo upravljanja in vodenja prometnih sistemov. Ima močan vpliv na organizacijo projektiranja, izgradnjo, proizvodnjo in vzdrževanje prometne infrastrukture.

Ekonomski vidik predstavlja promet kot del gospodarstva. Promet je namreč posebna dejavnost materialne proizvodnje, pri kateri človek deluje s prometnimi sredstvi na predmete dela (blago, potniki), in pri tem ustvarja novo prometno storitev, ki je del narodnega gospodarstva.

Pravni vidik se nanaša na upoštevanje nacionalne in mednarodne zakonodaje, ki urejata obveznosti, odgovornosti in pravice med sodelujočimi v procesih proizvodnje prometne storitve.

3.EPIDEMIJA COVID-19

3.1 KORONAVIRUSI

Koronavirusi so virusi, ki povzročajo bolezni pri ljudeh in živalih. Okužba s koronavirusi pri živalih se lahko kaže z različnimi simptomi, kot npr. driska pri kravah, vnetje zgornjih dihal pri piščancih. Pri ljudeh koronavirusi povzročajo okužbe dihal, ki so običajno blage, lahko pa tudi hude, celo smrtne.

Koronaviruse so odkrili v 60-ih letih prejšnjega stoletja. Prvi odkriti koronavirusi povzročajo pri ljudeh v večini primerov blago okužbo zgornjih dihal in so odgovorni za 15–30 odstotkov prehladov. Izjemoma lahko povzročajo okužbo spodnjih dihal, kot sta pljučnica in bronhitis (Wikipedia).

3.1.1 SARS

Leta 2003 so odkrili novi sev koronavirusa, imenovan SARS-CoV, ki je povzročil bolezen SARS oz. hud akutni respiratorni sindrom ali atipično pljučnico. Povzroča bolezen, ki se najprej kaže kot bolečine v mišicah, glavobol in povišana telesna temperatura, kasneje pa se pojavita še kašelj in pljučnica.

Bolezen so odkrili v kitajski provinci Guangdong. Epidemija je zajela Kitajsko, v manjšem obsegu še druge države JV Azije. Nekaj ljudi je zbolelo iz Evrope in Severne Amerike, ki so jih, po ugotovitvi bolezni, izolirali. Ugotovili so, da se bolezen prenaša kapljično in da se virus nahaja tudi v blatu okuženih. Za preprečitev te bolezni je bilo priporočeno izogibanje stikov z obolelim, nošenje maske in pogosto umivanje rok (VIVA).

3.1.2 COVID-19

Bolezen COVID-19 povzroča koronavirus oz. SARS-CoV-2 in je sorodni sev koronavirusa SARS-CoV. Novi koronavirus je izbruhnil novembra 2019, središče izvora je bilo v mestu Wuhan na Kitajskem. Sprva je šlo za veliko primerov pljučnice, kar so kasneje prepoznali kot novo obliko virusa. Virus se širi kapljično, kar pomeni s kihanjem ali kašljanjem, z dotikanjem okuženih površin in nato našega obraza, predvsem oči, nosu in ust, in z zadrževanjem v majhnem in zaprtem prostoru, v katerem se je nahajala okužena oseba.

Okužba ima zelo raznolike simptome. Lahko so zelo blagi ali pa se kažejo kot oteženo dihanje, bolečine v mišicah, kašelj, vročina, utrujenost, izguba vonja in okusa. V težjih primerih se lahko virus prelevi v pljučnico ali sindrom akutne dihalne stiske, kjer lahko odpovejo organi, nastanejo lahko krvni strdki, obstaja tudi možnost smrti (NIJZ).

V decembru 2019 je Kitajska obvestila Svetovno zdravstveno organizacijo (WHO) o številnih primerih pljučnice, ki jo povzroča novi koronavirus. Konec meseca decembra so v Wuhanu zaradi novega

koronavirusa razglasili karanteno. Januarja so se nato pojavili prvi primeri v ZDA in Evropi – v Franciji. Konec januarja je WHO zaradi novega koronavirusa razglasil izredne razmere po svetu.

V februarju 2020 se je v Italiji pojavil prvi primer okuženega z novim koronavirusom in kmalu za tem je italijanska vlada sprejela sklep za karanteno, saj je Italija postala novo žarišče virusa. Virus je kmalu dosegel sosednji Hrvaško in Avstrijo.

Meseca marca je WHO razglasil novi koronavirus za pandemijo. Na začetku tega meseca se je pojavil tudi prvi primer okužbe v Sloveniji. V strogo karanteno je istega meseca poleg ostalih držav vstopila tudi Slovenija in razglasila epidemijo. Pričeli so se ostrejši ukrepi, kot zaostritev pogojev na meji za vstop v državo (Transport logistika).
Ministri EU za promet so v sodelovanju z Evropsko komisijo razpravljali, kako čimbolj efektivno zmanjšati prekinitve v prometu s poudarkom na prevažanju življenjsko pomembnega blaga. Zaradi celotne situacije je tržni inšpektorat trgovcem prepovedal dvig cen. V sredini meseca marca so tako v Sloveniji ostale odprte le trgovine z živili, lekarne, bencinske črpalke, pošte in najnujnejše storitve za preživetje. Ostale trgovske storitve so se preselile na splet.

V začetku aprila se je novi koronavirus razširil po skoraj vsem svetu. Najhuje je bilo v Ameriki, sledili sta Italija in Španija. Konec aprila se je stanje umirilo. Evropske države so začele sproščati omejitve, vendar še vedno pod nadzorom z uporabo mask in razkužil.

V začetku maja so v EU razpravljali o možnih rešitvah v cestnem, letalskem, pomorskem in železniškem prometu zaradi negativnih učinkov novega koronavirusa.

4.VPLIV EPIDEMIJE COVID-19 NA PROMET V SLOVENIJI

Ukrepi za preprečevanje okužb s koronavirusom med prebivalstvom so povzročili neugodne gospodarske posledice, ki so opazne v tovornem, še bolj pa v potniškem prometu.

Javni cestni potniški promet je bil v letu 2020 za približno 50 odstotkov manjši kot leto prej. Razlog za to so bili ukrepi za zajezitev epidemije COVID-19 in s tem povezan Odlok o začasni prepovedi in omejitvah javnega prevoza potnikov v Republiki Sloveniji, s katerim je bil promet te vrste 16. 3. 2020 ustavljen in znova, v prilagojeni obliki, vzpostavljen 11. 5. 2020 (RS Statistični urad).

Cestni tovorni promet ni bil toliko okrnjen, saj so tovorna cestna vozila v letu 2020 prepeljala 2 odstotka manj blaga v notranjem prometu, medtem pa so v mednarodnem prometu prepeljala za 1 odstotek več blaga kot leto prej. V notranjem prometu je bilo prepeljanega 58 odstotkov vsega blaga, v mednarodnem pa 41 odstotkov vsega blaga. Največ je bilo prepeljanega blaga iz blagovne skupine rude in kamnine ter kmetijski, gozdarski in ribiški proizvodi.

Občuten vpliv epidemije je bil tudi v zračnem prometu. Prek glavnih treh slovenskih mednarodnih letališč – Letališče Jožeta Pučnika Ljubljana, Letališče Edvarda Rusjana Maribor, Letališče Portorož – je v letu 2020 potovalo 83 odstotkov manj potnikov kot leto prej. Velika večina prepeljanih potnikov je potovalo preko Letališča Jožeta Pučnika Ljubljana. 89 odstotkov vseh potnikov je potovalo z rednimi leti, in sicer največ na relaciji Slovenija – Nemčija in Slovenija – Turčija. S posebnimi leti je potovalo 11 odstotkov vseh potnikov, od tega največ na relacijah med Slovenijo in Grčijo ter Egiptom.

V letu 2020 je bilo v letalskem tovornem prometu za 7 odstotkov manj blaga kot leto prej. 93 odstotkov tega blaga je bilo prepeljano z rednimi leti (RS Statistični urad).

Prav tako je epidemija močno vplivala na pomorski promet. V Luki Koper so tako v letu 2020 pretovorili 14 odstotkov manj tovora kot leto prej. Največji upad pretovora je bil pri terminalih za generalni tovor, terminalih za sipki in razsuti tovor in terminalih za tekoči tovor. Pri pretovoru blagovne skupine kontejnerjev je ta ostal stabilen.

Potniški promet v Luki Koper je bil v letu 2020 zelo prizadet, saj v tem letu ni v luki pristala nobena ladja za križarjenje. Posledično se je zmanjšalo število zaposlenih v potniškem prometu za 51 odstotkov (Luka Koper).

Zaradi epidemije se je ustavil železniški potniški promet, kar je močno vplivalo na poslovanje Slovenskih železnic. Potniški promet je namreč njihova primarna dejavnost in z njegovo ustavitvijo so imeli velik izpad transportnih prihodkov. Na čakanje so poslali 98 odstotkov zaposlenih.

Tudi v tovornem prometu so Slovenske železnice občutile vpliv COVID-19 na poslovanje, saj se je delo odvijalo 80-odstotno. Na čakanje na delo je bilo napoteno med 37 do 42 odstotkov zaposlenih. Z izrednimi vožnjami vlakov na lokalnih progah je tovorni promet po železnicah neposredno omogočil dostavo in odvoz tovora slovenskim podjetjem in podprl lokalno gospodarstvo. Slovenske železnice so se s poslovnimi partnerji redno dogovarjale za optimalno organizacijo prevozov. Tovorni vlaki so vozili neovirano tudi v tujino. Na mejnih prehodih je delo potekalo večinoma brez težav, vendar pa v nekoliko zmanjšanem obsegu (Nova proga).

5.ZAKLJUČEK

Novi koronavirus je močno prizadel svetovno ekonomijo. Padec se pozna v marsikaterih gospodarskih panogah, razen v farmaciji.

V Sloveniji je močno upadel potniški promet v vseh prometnih panogah. Bolje je bilo v tovornem prometu, saj je ta upadel za manjši odstotek.

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IMPACT OF COVID-19 ON TRANSPORT

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SUMMARY

Transport is strongly connected with population. If there were no traffic, we would not be able to move from one place to another. Through movement, one creates new transport services and other activities thus affecting national economy.

The emergence of the Coronavirus has a major impact on transport, especially passenger, and living conditions. COVID-19 has a strong impact on global and Slovenian economy.

Key words: pandemic, COVID-19, traffic/transport

1.INTRODUCTION

Transport is strongly associated with national economy. It affects division of labour, reflected in structure of economy, especially in regional economic development of each country. It creates transport services in its production.

The virus, which has emerged, has dramatically changed business conditions in transport as well, causing damage to global economy. The Coronavirus grew into a pandemic and spread across the world, strongly impacting economy and living conditions.

2.TRANSPORT

In theory and practice, term transport can often refer to transport, traffic, communication, …

Theorists define the concept of transport from different aspects, which have different meanings. Term transport is presented as an economic term, e.g. money circulation, trade. In logistics, the concept of transport involves transfer of people, things, information, money and energy from one place to another. Furthermore, it covers operations related to transport of goods, passengers and communications.

Transport is a system consisting of subsystems/transport industries, evaluated by single criterion, where technical, technological, organizational, economic and legal aspects are to be taken into account.

Technical aspect is the basis consisting of:
- means of transport, by which transport operations are carried out;
- routes, where transport moves;
- transport hubs, where initial/final operations are performed;
- transport infrastructure.

Technological aspect is the basic process for production of transport services. It covers three phases, namely (Medeot, 2005):
- transport preparation technology,
- transport technology,
- transport termination technology.

Technology of transport preparation requires means of transport, personnel performing transport and other integral parts of organization. Transport technology covers all operations from the moment cargo is loaded into means of transport to the moment the cargo is handed over and unloaded. In termination technology, costs are calculated, possible complaints are resolved and entire transport process is analysed.

Organizational aspect refers to laws, knowledge, skills, organization and traffic/transport management. It has a strong influence on system of design, construction, production and transport infrastructure maintenance.

Economic aspect refers to transport as part of the economy. Namely, transport is special production activity, where one operates with means of transport on objects of work (goods, passengers) thus creating new transport service, which is part of national economy.

Legal aspect refers to national and international legislation governing obligations, responsibilities and rights between participants in the processes of production of transport services.

3.THE COVID-19 PANDEMIC

3.1 CORONAVIRUSES

Coronaviruses are viruses causing disease in humans and animals. Signs of Coronavirus infection in animals are diarrhea in cows, inflammation of upper respiratory tract in chickens. In humans, coronaviruses cause mild respiratory infections, some can also be severe, even fatal.

Coronaviruses were discovered in the 1960s. First coronaviruses detected in humans, in most cases, cause a mild upper respiratory infection and are responsible for 15-30 percent of colds. Exceptionally, they can cause lower respiratory tract infections such as pneumonia and bronchitis (Wikipedia).

3.1.1 SARS

In 2003, a new strain of coronavirus, called SARS-CoV, causing SARS, i.e. severe acute respiratory syndrome or atypical pneumonia, was discovered. It causes a disease that first manifests as muscle aches, headaches and fever, followed by coughing and pneumonia.

Disease was discovered in the Chinese province of Guangdong. The epidemic spread to China and (to a lesser extent) to other countries in SE Asia. Few people from Europe and North America fell ill yet were isolated after being diagnosed. It is an airborne virus also found in faeces of the infected. In order to prevent transmission, it was recommended to avoid contact with the patient, wear a mask and practice frequent hand hygiene. (VIVA).

3.1.2 COVID-19

COVID-19 is caused by coronavirus or SARS-CoV-2 and is a related strain of SARS-CoV. A new coronavirus broke out in November 2019, in Wuhan, China. Initially, there were cases of pneumonia, later recognized as a new form of virus. Virus is airborne, meaning being spread by aerosols by sneezing, coughing, touching infected areas and then one’s face, especially eyes, nose and mouth, and by staying in small and enclosed space where infected person was located.

Infection has a wide variety of symptoms. They can be very mild manifesting as shortness of breath, muscle aches, cough, fever, fatigue, loss of smell and taste. In severe cases, virus can progress to pneumonia or acute respiratory distress syndrome, where organs can fail, blood clots can form, and there is a possibility of death (National Institute of public Health).

In December 2019, China notified the World Health Organization (WHO) of a number of cases of pneumonia caused by new coronavirus. At the end of December, due to new coronavirus, quarantine was declared in Wuhan. In January, the first cases appeared in the USA and Europe (France). At the end of January, the WHO declared a state of emergency due to new coronavirus.

In February 2020, the first case of infection appeared in Italy and shortly thereafter, the Italian government adopted a quarantine as Italy became a new virus outbreak. The virus soon reached neighbouring Croatia and Austria.

In March, the WHO declared a new coronavirus a pandemic. At the beginning of March 2019, the first case of infection in Slovenia appeared. In the same month, in addition to other countries, Slovenia declared quarantine due to a global pandemic. Tougher measures were launched, such as tightening border conditions when entering the country (Transport logistics).

EU Transport Ministers, in cooperation with the European Commission, discussed how to minimize traffic disruptions by focusing on transport of vital goods. Due to the whole situation, Market Inspectorate banned raising prices. In mid-March, only grocery stores, pharmacies, petrol stations, post offices and other essential services remained open in Slovenia. Other retail services moved online.

In early April, new coronavirus spread all over the world. The worst was in the USA, followed by Italy and Spain. Situation calmed down at the end of April. European countries released restrictions, yet still under control (mandatory mask use and disinfectants).

In early May, the EU discussed possible solutions in road, air, sea and rail transport due to negative effects of Coronavirus.

4.IMPACT OF COVID-19 ON TRANSPORT

Measures to prevent coronavirus infections among population have had negative economic consequences, especially noticeable in freight and passenger transport.

Public road passenger transport in 2020 was approximately 50% lower than the year before. Reason for decrease are measures to contain and control the COVID-19 epidemic in the Ordinance on the temporary ban and restrictions on public transport of passenger in the Republic of Slovenia, which stopped traffic on 16 March 2020 and re-established it on 11 May 2020 (RS Statistical Office).

Road transport was not that affected; road trucks carried 2% less goods in domestic transport than in 2020, while international transport transported 1% more goods than the previous year. 58% of all goods were transported in domestic, 41% of all goods in international transport. Most goods transported were ore and rock, as well as agricultural, forestry and fishery products.

Epidemic significantly affected air transport. In 2020, 83% fewer passengers used three main Slovenian international airports: Ljubljana Jože Pučnik Airport, Maribor Edvard Rusjan Airport Portorož Airport - than previous year. The vast majority used Ljubljana Jože Pučnik Airport. 89% of all passengers used scheduled flights, mostly Slovenia – Germany – Slovenia – Turkey. 11% of all passengers booked special flights from Slovenia, Greece and Egypt.

Air freight fell by 7% compared to 2019. 93% of these goods were transported by scheduled flights (RS Statistical Office).

The epidemic also had a major impact on maritime transport. In 2020, Port of Koper handled 14% less cargo than a year before. Largest decrease in transhipment was in general cargo terminals, bulk and bulk cargo terminals and liquid cargo terminals. Container transhipment remained stable.

Port of Koper was severely affected in terms of passenger transport as it saw no cruise ships docking. Consequently, employees in passenger transport decreased by 51% (Port of Koper).

Due to the epidemic, railway passenger traffic stopped, which had a strong impact on Slovenian Railways. Passenger transport is their primary activity and its ban resulted in large loss of transport revenues. 98% employees were furloughed.

In freight transport, only 80% of Slovenian Railways operated due to the COVID-19 epidemic. Between 37% and 42% of employees were furloughed. By exemption trains ran on local lines, freight transport enabled delivery and collection of freight to Slovenian companies and supported local economy. Slovenian Railways regularly complied with business partners on optimal organization of transport. Freight trains could also travel abroad. At border crossings, work mostly ran smoothly, however, on slightly reduced scale (New Line).

5.CONCLUSION

The new Coronavirus has hit the world economy hard. Decline is seen in all industries except pharmacy.

In Slovenia, passenger traffic in all transport sectors fell sharply, only freight transport fell by a smaller percentage.

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PROMETNO – TEHNIČKA ŠKOLA ŠIBENIK

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IKT TEHNOLOGIJA U POMORSKOM PROMETU

SAŽETAK

Raditi u pomorskom sektoru znači školovati se cijeli život te biti u korak s vremenom i pratiti razvoj informacijske i komunikacijske tehnologije koja se razvija velikom brzinom.

Brodovi trgovačke mornarice danas su visoko tehnološki opremljeni te njihova posada mora biti školovana u skladu sa STCW konvencijom. Broj posade na brodovima značajno opada zbog tehnološkog razvoja, stoga ukrcani član posade treba biti dobro obrazovan. Što su nekad radila dva ili tri pomorca, danas mora obavljati jedan pomorac uz pomoć informacijske i komunikacijske tehnologije.

Sustav za nadzor i upravljanje pomorskim prometom prati i upravlja pomorskim prometom korištenjem IKT tehnologija. Najviše se koristi automatska identifikacija brodova te pomorska radiokomunikacijska tehnologija.

U Republici Hrvatskoj, koja je tradicionalno pomorska zemlja, srednje pomorske škole da bi proizvele dobar i konkurentan kadar za rad u pomorskom sektoru opremaju se različitim vrstama pomorskih, komunikacijskih i navigacijskih simulatora te opremom za izvođenje nastave u skladu sa zahtjevima STCW konvencije. Opremanje srednjih škola koje provode obrazovne programe za pomorskog nautičara i tehničara za brodostrojarstvo u Republici Hrvatskoj potiče i Ministarstvo mora, prometa i infrastrukture dodjeljivanjem bespovratnih sredstava prema javnim pozivima.

Ključne riječi: STCW konvencija, brodovi trgovačke mornarice, sustav za nadzor i upravljanje pomorskim prometom, pomorske škole, simulatori, oprema.

1. UVOD

Pomorski promet daje veliki gospodarski doprinos u cijelome svijetu na međunarodnoj i međuregionalnim razinama. IKT tehnologija u pomorskom prometu se koristi već dugi niz godina, a ponajviše u svrhu povećanja sigurnosti pomorskog prometa. Ljudske pogreške se nastoje smanjiti na minimum stoga pomorac treba biti obrazovan u skladu s STCW konvencijom da bi se ukrcao na brod. Pomorac koristi IKT tehnologiju i prilikom razmjene informacija sa drugim sudionicima u pomorskom prometu.

Danas sustav za nadzor i upravljanje pomorskim prometom vodi računa o sigurnosti pomorskog prometa tako što prati, upravlja i organizira cijelokupni pomorski promet.

Srednje škole koje provode obrazovne programe za pomorskog nautičara i tehničara za brodostrojarstvo (u daljnjem tekstu pomorske škole) nastoje pratiti razvoj IKT tehnologija te školovati kadrove u skladu s STCW konvencijom.

2. IKT TEHNOLOGIJA NA BRODOVIMA

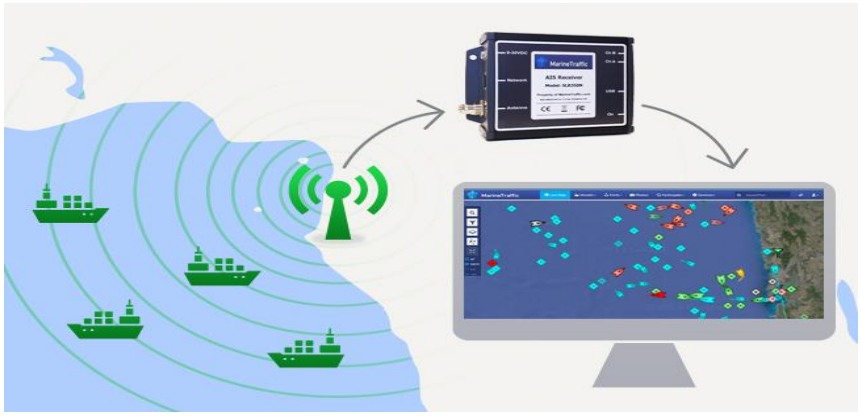
Danas pomorac kako bi se ukrcao na brodove trgovačke mornarice treba biti školovan u skladu s STCW (Standards of Training, Certification and Watchkeeping for Seafarers) konvencijom te proći određene treninge koji se zahtjevaju za određenu funkciju na brodu. Postoje različiti STCW tečajevi kojima se pomorci između ostalog osposobljavaju i za korištenje različitih informacijsko komunikacijskih tehnologija na brodovima. Neke IKT – tehnologije koje se danas koriste na brodovima su: ARPA radar, ECDIS, AIS, VDR, BNWAS, LRIT, GMDSS oprema i dr.

ARPA (Automatic radar plotting aid) radar je uređaj koji daje podatke o objektima koji se prate, a na taj način se dobiju podaci koji mogu puno pomoći posebno u situaciji kada postoji opasnost od sudara. Optimalan je uređaj za brze izračune i neposredno izvođenje manevra izbjegavanja sudara na moru.

ECDIS (Electronic chart display and information system) je uređaj koji je preglednik elektroničkih karata (vektorskih ili rasterskih) i informacijski sustav. Polako postaje zamjena za papirnate navigacijske karte.

Slika 1. ARPA radar i ECDIS

AIS (Automatic Identification System) je uređaj koji prima i predaje podatke, a AIS sustav je sustav namijenjen automatskom praćenju brodova i razmjeni podataka.



Slika 2. AIS sustav

(Izvor: https://www.marinetraffic.com/en/p/expand-coverage)

VDR (Voyage Data Recorder) održava i čuva, na siguran i dostupan način, informacije u vezi pozicije, kretanja, fizičkog statusa, komandi i upravljanja broda za period uoči i nakon mogućeg incidenta.

Slika 3. VDR

(Izvor: https://www.nauticexpo.com/prod/consilium-marine-safety/product-28124-429489.html)

BNWAS (Bridge Navigational Watch Alarm System) sustav alarma nebudnosti na mostu nadzire aktivnosti dežurnog časnika palube na straži tijekom navigacije. U slučaju neaktivnost ili neraspoloživosti dežurnog časnika na mostu, sustav automatski upozorava zapovjednika ili nekog drugog časnika palube.
LRIT (Long Range Identification and Tracking) sustav identifikacije i praćenja velikog dosega omogućava globalnu identifikaciju i praćenje brodova. LRIT mora omogućiti automatsko i bez ljudske intervencije na brodu odašiljanje brodske LRIT informacije u intervalima od šest sati LRIT centru podataka.
GMDSS oprema na brodovima uključuje VHF DSC radiotelefonski uređaj, MF/HF DSC radiotelefonski uređaj, radioteleks, Inmarsat uređaji, Navtex, EPIRB, SART, prijenosni VHF uređaj. Brodovi se opremaju GMDSS opremom ovisno o području plovidbe i veličini broda. GMDSS koristi zemaljski i satelitski sustav veza. SART uređaj na brodovima se može zamjeniti sa AIS SART uređajem.

Slika 4. GMDSS oprema
(Izvor: https://cultofsea.com/gmdss/gmdss-radio-equipment-requirements-on-ship-as-per-solas/)

U budućnosti se planiraju razvijati "pametni" i autonomni brodovi. To bi bila plovila sa smanjenim brojem posade ili bez posade s kojima bi se upravljalo i nadziralo ih s obale iz centara za podršku za tehnički rad i daljinsko održavanje.

3. SUSTAV ZA NADZOR I UPRAVLJANJE POMORSKIM PROMETOM

Posljednjih godina napredak u informacijskim i komunikacijskim tehnologijama stvorio je potražnju za novim oblicima nadzora i sustava upravljanja informacijama.

Sustav za nadzor i upravljanje pomorskim prometom (Vessel Traffic Monitoring and Information System) je složeni tehnički i informacijski sustav namijenjen praćenju, upravljanju i organizaciji cjelokupnog pomorskog prometa. Nadzor i upravljanje pomorskim prometom provodi se u cilju povećanja sigurnosti pomorske plovidbe, učinkovitosti pomorskog prometa i zaštite morskog okoliša, te obuhvaća:

1. prikupljanje podataka o pomorskim objektima i pomorskom prometu
2. davanje podataka pomorskim objektima
3. davanje plovidbenih savjeta i podrške u plovidbi pomorskim objektima
4. organizaciju plovidbe i upravljanje pomorskim prometom. [3]

4. IKT TEHNOLOGIJA U SREDNJOŠKOLSKOM OBRAZOVANJU POMORACA U RH

Hrvatski pomorci su jako traženi na svjetskom tržištu radne snage. U tom kontekstu, pomorske škole školuju buduće pomorce za domaće, ali i svjetsko tržište radne snage, stoga se, kako bi proizvele dobar i konkurentan kadar za rad u pomorskom sektoru, pomorske škole opremaju se različitim vrstama simulatora te opreme za izvođenje nastave u skladu sa zahtjevima STCW konvencije. Opremanje srednjih škola, koje provode obrazovne programe za pomorskog nautičara i tehničara za brodostrojarstvo u Republici Hrvatskoj, potiče i Ministarstvo mora, prometa i infrastrukture dodjeljivanjem bespovratnih sredstava prema javnim pozivima.

Javnim pozivom za održavanje školskih brodova srednjoškolskih pomorskih učilišta i opremanje obveznom opremom u skladu s odredbama STCW konvencije, želi se utjecati na ostvarivanje ciljeva iz Strateškog plana Ministarstva mora, prometa i infrastrukture za razdoblje 2020.-2022. godine, kroz promociju, jačanje kompetencija i podizanje kvalitete obrazovanja učenika u srednjim školama koje provode strukovne programe u sektoru pomorstva. [4]

Slika 5. Školski GMDSS simulator Prometno – tehničke škole Šibenik – TRANSAS TGS 5000

Slika 6. Školski navigacijski simulator Prometno – tehničke škole Šibenik - TRANSAS NTPro 5000

5. ZAKLJUČAK

U pomorskom prometu mnogo je primjera korištenja IKT-a, tehnologije koja će se i u budućnosti razvijati. Stoga je povezani i automatizirani pomorski promet budućnost pomorske industrije. Samo je dobro obrazovan pomorac i pomorac koji se cjeloživotno obrazuje, konkurentan pomorac na svjetskom tržištu rada. Pomorske škole trebaju pratiti taj trend razvoja IKT-a i pravovremeno se opremati različitim informacijskim i komunikacijskim simulatorima i opremom.

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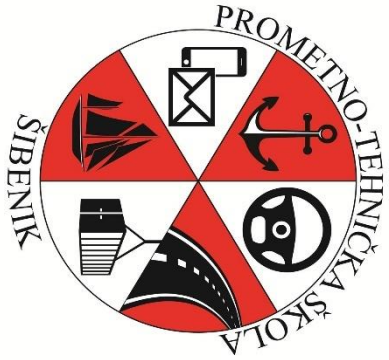
PROMETNO – TEHNIČKA ŠKOLA ŠIBENIK

(TRAFFIC - ENGINEERING SCHOOL SIBENIK)



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ICT TECHNOLOGY IN MARITIME TRANSPORT

ABSTRACT

To work in the maritime sector means to be educated all your life, to keep up with the times, and to monitor the development of information and communication technology that is developing at a high speed.

Merchant Navy ships are highly technologically equipped today and their crew must be

educated in accordance with the STCW Convention . Crew numbers are declining significantly due to technological development, and therefore the boarded crew should be well educated. What two or three sailors once did, today must be done by only one seafarer with the help of information and communication technology.

The maritime traffic monitoring and management system, monitors and manages maritime traffic using ICT technologies. The most widely used are automatic ship identification and maritime radio communication technology.

In the Republic of Croatia, which is traditionally a maritime country, secondary maritime schools are equipped with various types of maritime, communication and navigation simulators and teaching equipment,

in accordance with the requirements of the STCW Convention, to produce good and competitive maritime sector personnel. The Ministry of the Sea, Transport and Infrastructure encourages the equipping of secondary schools providing educational programs for mariners and shipbuilding technicians in the Republic of Croatia by awarding grants according to public calls.

Keywords: STCW Convention, Merchant Navy Ships, Maritime Traffic Control and Management System, Naval Schools, Simulators, Equipment .

1. INTRODUCTION

Maritime transport is a major economic contributor to the international and interregional levels worldwide. ICT technology in maritime transport has been used for many years, mostly for the purpose of increasing maritime safety. Human errors are sought to be minimized, so the mariner must be educated in accordance with the STCW Convention in order to board the ship . The seafarer also uses ICT technology to share information with other maritime actors .

Today, the maritime traffic control and management system takes care of maritime safety by monitoring, managing and organizing all maritime traffic.

Secondary schools providing training programs for naval boaters and shipbuilding technicians (hereinafter referred to as maritime schools) seek to monitor the development of ICT technologies and train staff in accordance with the STCW Convention.

2. ICT TECHNOLOGY ON BOARD

Today, in order to be embarked on merchant navy vessels, a naval vessel must be trained in accordance with the STCW (Standards of Training, Certification and Watchkeeping for Seafarers) Convention and undergo certain training required for a specific function on board. There are different STCW courses which sailors, among others, trained for the use of different information and communication technologies on ships . Some of the ICT technologies used on board today are: ARPA radar, ECDIS, AIS , VDR, BNWAS, LRIT , GMDSS equipment.

ARPA (Automatic Radar Plotting Aid) radar is a device that provides information about monitored objects, thus obtaining data that can be of great help especially in situations where there is a risk of collision. An optimal device for quick calculations and direct execution of a collision avoidance maneuver at sea.

ECDIS (Electronic chart and information system) is a device that is an electronic chart viewer (vector or raster) and an information system. It is slowly becoming a substitute for paper navigation charts.

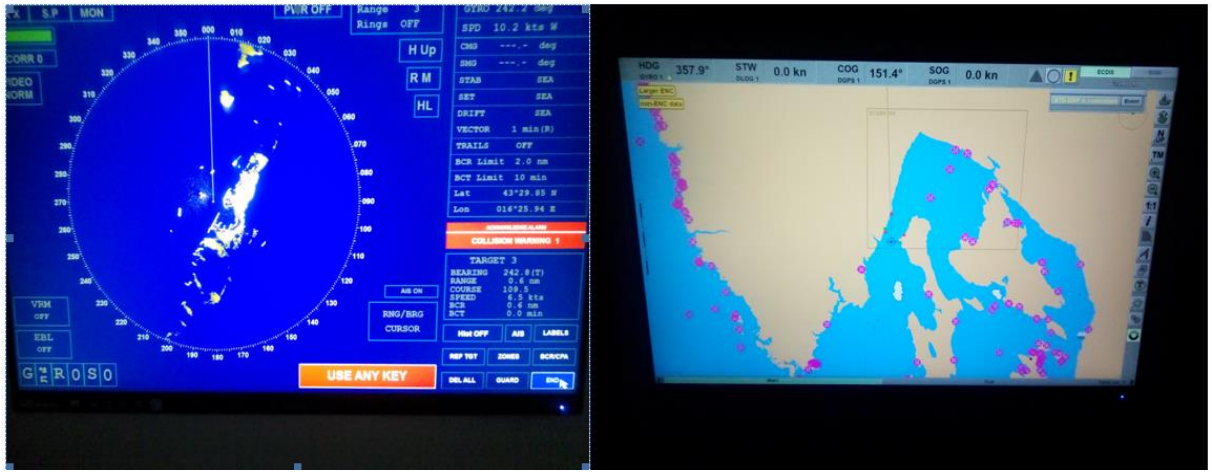

Figure 1. ARPA radar and ECDIS

AIS (Automatic Identification System) is a device that receives and transmits data, and the AIS system is a system designed to automatically monitor ships and exchange data.

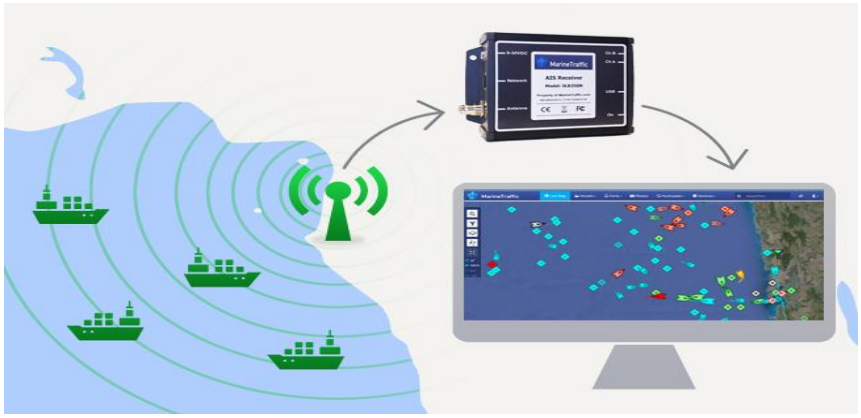

Figure 2. AIS system

(Source: h ttps: //www.marinetraffic.com/en/p/expand-coverage)

VDR (Voyage Data Recorder) maintains and stores, in a secure and accessible manner, information regarding the position, movement, physical status, commands and management of the ship for a period before and after a possible incident.

Figure 3. VDR

(Source: https://www.nauticexpo.com/prod/consilium-marine-safety/product-28124-429489.html)

BNWAS (Bridge Navigational Watch Alarm System) is a bridge alarm system that monitors the activities of duty deck officers on watch during navigation. In case of inactivity or unavailability of a duty officer on the bridge, the system automatically alerts the commander or other deck officers.

LRIT (Long Range Identification and Tracking) enables global ship identification and tracking. The LRIT must enable the transmission of ship's LRIT information at intervals of six hours to the LRIT data center automatically and without human intervention on board.

GMDSS equipment includes VHF DSC radiotelephony device, MF / HF DSC radiotelephony device, radiotelex, Inmarsat devices, Navtex, EPIRB, SART, portable VHF devices. Ships are equipped with GMDSS equipment regardless of the area of navigation and the size of the ship. GMDSS uses a terrestrial and satellite link system. The SART device on vessels can be replaced with the AIS SART device.

Figure 4. GMDSS equipment

(Source: https://cultofsea.com/gmdss/gmdss-radio-equipment-requirements-on-ship-as-per-solas/)

Future plans are to develop "smart" and autonomous ships. That would be a vessel with a reduced number of crew or without crew with which to manage and supervise them from the shore of support centers for technical operation and remote maintenance.

3. MARITIME TRAFFIC CONTROL AND MANAGEMENT SYSTEM

In recent years, advances in information and communication technologies have created a demand for new forms of surveillance and information management systems .

The Vessel Traffic Monitoring and Information System (Vessel Traffic Monitoring and Information System) is a complex technical and information system designed to monitor, manage and organize all maritime traffic. The supervision and management of maritime transport is carried out in order to increase the safety of maritime navigation, the efficiency of maritime transport and the protection of the marine environment, and includes:

1. collecting data on maritime facilities and maritime transport

2. providing information on maritime facilities

3. providing navigation advice and support in navigating maritime facilities

4. organizing navigation and managing maritime traffic. [3]

4. ICT TECHNOLOGY IN SECONDARY EDUCATION FOR SEAFARERS

Croatian seafarers are in high demand in the world labor market. Maritime Schools educate future seafarers for domestic and global labor market. To produce good and competitive staff to work in the maritime sector, maritime schools are equipped with different types of simulators and equipment for teaching in accordance with the requirements of the STCW Convention. The Ministry of the Sea, Transport and Infrastructure, encourages the equipping of secondary schools providing educational programs for deck cadets and ship engineering technicians in the Republic of Croatia, by awarding grants according to public calls.

The public call for the maintenance of school ships of secondary maritime colleges and equipping them with mandatory equipment in accordance with the provisions of the STCW Convention, to influence the achievement of the objectives of the development strategy aims of the Ministry of the Sea, Transport and Infrastructure for the period 2020.-2022. Through the promotion, strengthening of competences and raising

the quality of education of students in secondary schools pursuing vocational programs in the maritime sector. [4]

Figure 5. School GMDSS simulator in Traffic – engineering school Sibenik - TRANSAS TGS 5000

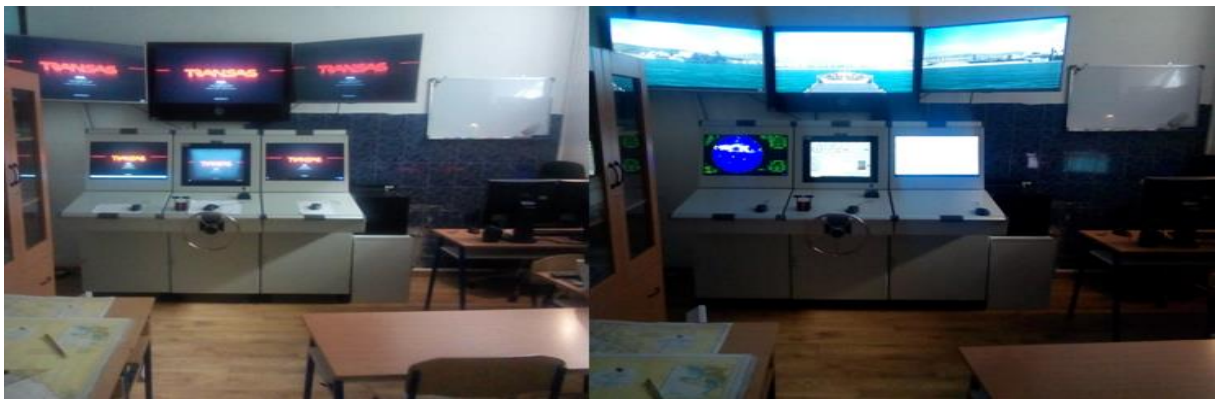

Figure 6. School Navigation Simulator in Traffic – engineering school Sibenik - TRANSAS NTPro 5000

5. CONCLUSION

There are many examples of maritime transport using ICT technology. ICT technology will continue to evolve in the future. Therefore, committed and automated maritime transport is the future of the maritime industry. Only well educated and lifelong seafarer are competitive seafarers in the global job market. Maritime schools should follow this trend in the development of ICT technology and be equipped with various information and communication simulators and equipment in a timely manner.

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Tema:

Obrazovni sustavi

Naslov rada:

Menadžment u strukovnom obrazovnom sustavu

Sažetak

Punom implementacijom menadžmenta u obrazovni sustav poboljšava se praksa upravljanja obrazovnim institucijama i njenim procesima. U konačnici postiže se jačanje kompetencija menadžera u obrazovanju za upravljanje odgojno obrazovnom organizacijom. To bi trebalo doprinijeti unapređenju uvjeta rada, učinkovitijem rješavanju problema, jačanju imidža obrazovne organizacije, jačanju motivacije zaposlenih, ali i većeg zadovoljstva krajnjih korisnika odgojno obrazovnih usluga (roditelja i učenika). Krajnji cilj uspješnog menadžmenta u strukovnom obrazovanju je postizanje što kvalitetnijeg obrazovnog *outputa* odnosno znanja za tržište rada i mogućnosti brze zapošljivosti učenika u ulozi budućih zaposlenika, ali i dugoročna stabilnost pozicije škole na tržištu odgojno-obrazovnih usluga. Može se zaključiti kako menadžment u strukovnom obrazovanju ima, na specifičan način, jače izražene dugoročne implikacije na društveno-ekonomski razvoj društva u cjelini, ali i veću podložnost rizicima, te mu je potrebno posvetiti dužnu pažnju. Stoga, u ovom radu težište je upravo na menadžmentu u strukovnom obrazovnom sustavu. U radu će se razmatrati funkcije menadžmenta s naglaskom na izazove upravljanja i rukovođenja stručnom srednjom školom koja obrazuje učenike u sektoru prometa i logistike u kontekstu aktualnih kretanja.

Ključne riječi: menadžment, obrazovanje, promet, funkcije menadžmenta

UVOD

Ovaj rad utemeljen je na osnovnom istraživačkom pitanju što čini temelje modernog školskog menadžmenta s naglaskom na specifičnosti strukovnih škola odnosno škola koje obrazuju učenike u sektoru promet i logistika. Stoga, temeljna svrha ovog rada je podizanje svijesti o važnosti menadžmenta u svakodnevnom djelovanju organizacijskih sustava stručnih srednjih škola, dok je predmet rada razmatranje sastavnica modernog menadžmenta uopće, uz uspostavljanje veze sa stručnim školama općenito odnosno srednjim strukovnih školama u sektoru promet i logistika, kako bi se utvrdila i istražila njihova znanstveno-aplikativna pozadina te pokušala stvoriti jedna nova integrirana cjelina. To ujedno predstavlja i jedan od temeljnih znanstvenih ciljeva ovog rada. Temeljem prethodno izloženih polaznica moguće je postaviti temeljnu radnu hipotezu ovog rada koja glasi:*„Pristup i ishodi menadžmenta u strukovnim srednjim školama u uskoj su povezanosti s pristupnom i ishodima općeg modernog menadžmenta"*. Metode znanstvenog istraživanja koje će se koristiti u ovom radu su: analiza, sinteza, indukcija, dedukcija i modeliranje.

1.OSNOVE MENADŽMENTA

Menadžment je zastupljen gotovo u svim područjima ljudskog djelovanja pa možemo govoriti o menadžmentu u obrazovanju, sportskom menadžmentu, turističkom menadžmentu, prometnom menadžmentu, zdravstvenom menadžmentu, projektnom menadžmentu, marketing menadžmentu itd. Najveći broj definicija o menadžmentu govori kao sposobnosti planiranja, organiziranja, vođenja i kontrole.[25] Dakle, težište menadžmenta je upravo na njegovim funkcijama. Razlog velikog broja klasifikacija i definicija posljedica je kompleksnosti pojmova, raznovrsnih filozofskih pristupa, teorijskih odrednica i različitosti prakse u menadžmentu. Buble navodi pet temeljnih funkcija menadžmenta i to:planiranje, organiziranje, kadroviranje, vođenje i kontroliranje.[26] Sikavica i suradnici među funkcije menadžmenta ubrajaju: planiranje, organiziranje, vođenje, menadžment ljudskih potencijala i kontroliranje.[27] Postoje različite vrste i tipovi menadžmenta. Kad govorimo o tipovima menadžmenta uobičajeno ih je razmatrati s aspekta razina i s aspekta djelokruga odgovornosti. S aspekta razina razlikuje se: vrhovni menadžment (najviša razina), srednji menadžment (srednja razina), niži menadžment (prva razina).[28] Vrhovni menadžment odgovoran je za organizaciju kao cjelinu, usmjeren je na strategiju i ciljeve poslovanja te iznalaženje načina angažiranja svih resursa organizacije za postizanje vrhunskih rezultata. Srednji menadžment implementira poslovne strategije i politike koje definira vrhovni menadžment. Niži menadžment odgovoran je za ostvarenje „dnevnih", operativnih zadataka, osiguranje tehničke asistencije te primjenu pravila i procedura za ostvarenje poslovne efikasnosti. Menadžment se često razmatra i kao

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25 O poimanju menadžmenta vidjeti više u Sikavica, P.; Bahtijarević-Šiber F: Menadžment: Teorija menadžmenta i veliko empirijsko istraživanje u Hrvatskoj, Masmedia, Zagreb, 2004. str.17.-21.

26 Buble, M.: Menadžment, Ekonomski fakultet u Splitu, Split 2009., str. 11.

27 Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, kolovoz, 2020. dostupno na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (pregledano 1.6.21)

prema Sikavica,P.; Bahtijarević-Šiber, F.; Pološki Vokić,N.: Temelji menadžmenta, Školska knjiga, Zagreb, 2008., str.20.-23.

28 Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, kolovoz, 2020. dostupno na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf(pregledano 1.6.21)

prema Buble,M.: Menadžment, Sveučilište u Splitu, Ekonomski fakultet Split, Split, 2009., str.10

operativni i strateški. Operativni menadžment usmjeren je na sadašnjost ili bližu budućnost te realizaciju onog što je definirano u okviru samog strateškog menadžmenta. S druge strane, strateški menadžment usmjeren je na dugoročnost uz uvažavanje i prilagođavanje različitim utjecajima iz okoline. Školska okolina može razmatrati kroz tri segmenta[29]: Opća (socijalna) okolina [opći politički, ekonomski, socijalni i tehnološki trendovi i odnosi]; Poslovna okolina [osnivači, lokalna zajednica; Ministarstvo znanosti i obrazovanja, Agencija za strukovno obrazovanje i obrazovanje odraslih, Agencija za obrazovanje, korisnici, donatori, sponzori, suradničke i konkurentske škole, zaposlenici, volonteri razna državna tijela i dr.]; Interna okolina [materijalni, ljudski i informacijski resursi; organizacijska kultura i organizacijska struktura].

2.FUNKCIJE MENADŽMENTA

Kad je riječ o funkcijama menadžmenta, one se najčešće razmatraju kroz planiranje, organiziranje, vođenje i kontrolu. Što se tiče *planiranja,* različitim definicijama planiranja zajedničko je kako je planiranje formalni proces koji je usmjeren na utvrđivanje zacrtanih ciljeva i izbor strategija za njihovo ostvarenje. Za učinkovito planiranje potrebno je odgovoriti: gdje se naša organizacija (škola) trenutno nalazi; gdje se želimo naći u budućnosti i kako to ostvariti, vodeći istovremeno računa o ograničenosti resursa i neizvjesnosti okoline.[30] Također, budući da je planiranje jedan složen i kreativan proces, potrebno je poduzeti i konkretne korake i to : a) situacijska analiza; b) postavljanje ciljeva; c) razvoj planskih premisa (koji troškovi, koja tehnologija i sl.); d) identificiranje alternativa; f) evaluacija alternativa; g) izbor alternativa; h) formuliranje izvedbenih planova; i) definiranje budžeta. Prethodno navedenom potrebno je pridodati i pitanje odgovornosti za planiranje. Među važnijim planovima u srednjoškolskim obrazovnim organizacijama su: Godišnji plan i program rada škole, Godišnji plan i program rada pedagoga, Godišnji plan i program rada ravnatelja, Godišnji plan i program rada raznih stručnih tijela (npr. stručnih vijeća), a na razini nastavnika tu su godišnji izvedbeni kurikulumi (tzv.GIK-ovi) za svaki nastavni predmet. Vizija, misija i ciljevi organizacije usko su povezani s procesom planiranja, pa su ujedno i neizostavna tema u ovom području. Vizija dolazi od latinske riječi *visio* što znači pojava, prikaz, no u kontekstu menadžmenta označava sliku budućnosti koja istovremeno treba biti realna i vjerodostojna, ali i privlačna, i to ne samo korisnicima proizvoda ili usluga već i samim zaposlenicima. Stoga, vizija ima dvije komponente i to: osnovnu ideologiju (usmjerenu na svrhu i vrijednost) i predvidivu budućnost.[31] I misija treba biti motivirajuća za zaposlene te sadržavati osnovnu politiku koju organizacija podupire. Također, naglasak nije na riječima već na aktivnosti, usmjerenosti na ljude i uspostavi povjerenja.[32] Što se ciljeva tiče, bitno je naglasiti kako oni imaju svoju hijerarhiju pa se može govoriti o općim organizacijskim ciljevima, ciljevima pojedinih organizacijskih jedinica, ili ciljevima pojedinca. Nadalje, ciljevi mogu biti strategijski odnosno dugoročni te kratkoročni, jednostavni i složeni,

[29] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, kolovoz, 2020. dostupno na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (pregledano 1.6.21)

prema Alfirević, N; Pavičić,J; Kutleša, M; Matković, J.: Osnove strateškog marketinga i menadžmenta u osnovnim i srednjim školama, Alfa d.d. Zagreb, Zagreb, 2010., str.29.-30.

[30] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, kolovoz, 2020. dostupno na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (pregledano 1.6.21) prema Buble,M.: Menadžment, Ekonomski fakultet Split, Sinergija d.o.o., Zagreb, 2006., str.109.-110.

[31] Op.cit.str.123.-124.

[32] Ibid.str.130.

strateški i operativni. Međutim, važno je uvažavanje tzv. SMART[33] kriterija prema kojem ciljevi trebaju biti specifični, mjerljivi, poticati na akciju, realistični i ostvarivi u određeno definiranom vremenu.[34] Što se tiče *organiziranja***,** postoji jako puno definicija organiziranja no zajedničko im je kako je organiziranje povezivanje ljudi i sredstava u kojem se ostvaruju ciljevi organizacije, uz poštivanje određenih pravila organizacijskog ponašanja.[35] Pri tome, jedna od najvažnijih dimenzija organizacije je koordinacija kao povezivanje podijeljenih a zatim i grupiranih poslova da bi se mogli ostvariti ciljevi organizacije. Također, tu je i pitanje delegiranja poslova i odgovornosti te donošenja odluka.[36] U tom smislu u školama kao organizacijama, jako je važno poznavati zakone i pravilnike koji definiraju odgovornosti i djelokrug rada ravnatelja škole, tajnika škole, računovođe i ostalog tj. pomoćnog osoblja, ali i da škole, u skladu sa zakonom, donesu svoje Pravilnike o sistematizaciji radnih mjesta.[37] Organizaciju rada stručne škole, među važnijim zakonima i podzakonskim aktima, reguliraju Zakon o odgoju i obrazovanju u osnovnoj i srednjoj školi[38], Zakon o strukovnom obrazovanju,[39] te Pravilnik o načinu organiziranja i provođenja nastave u strukovnim školama.[40] Za vještinu *vođenja* smatra se kako je ponajprije vezana za osobnost svakog pojedinog menadžera te bi se, kako navode Sikavica i suradnici, moglo reći da je to:…" umjetnost utjecanja na ljude tako da oni spremno i poletno teže ostvarenje ciljeva organizacije." Ono što je u tom smislu važno napomenuti jest kako u suvremenim uvjetima brzih promjena čelnici organizacija pa tako i škola trebaju biti ne samo menadžeri već i lideri odnosno vođe.[41] *Kontrola* je svojevrsna usporedba zacrtanog i ostvarenog u svrhu poduzimanja korektivnih aktivnosti za slučaj potrebe odnosno većih odstupanja. U uskoj je vezi sa samim planiranjem.[42] Naime, da bi mogli kontrolirati, potrebno je krenuti od toga što je planirano i koje je ciljeve potrebno ostvariti. Stoga, kontroliranje je važno kako bi se ograničila akumulacija pogrešaka i uspješno nosilo s kompleksnošću poslovanja. Kontrola od strane ravnatelja srednjoškolskih obrazovnih organizacija može se odvijati na različitim razinama od kontrole/evidencije radnog vremena zaposlenih, realizacije rasporeda sati i operativnih planova i programa nastavnika do evidencija u e dnevniku ali i svega ostalog iz djelokruga rada i dužnosti ravnatelja povezanog s mogućnostima kontrole temeljnog odgojno

[33] SMART skraćenica potječe od riječi engleskog porijekla: specific, measurable, action oriented, realistic, time limited, u prijevodu kao gore u tekstu.
[34] Ibid.str.137.
[35] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, kolovoz, 2020. dostupno na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (pregledano 1.6.21)

prema Sikavica,P.; Bahtijarević-Šiber, F.; Pološki Vokić,N.: Temelji menadžmenta, Školska knjiga, Zagreb, 2008., str.292.-294.
[36] Op.cit. str.339.
[37] **PRAVILNIK O DJELOKRUGU RADA TAJNIKA TE ADMINISTRATIVNO-TEHNIČKIM I POMOĆNIM POSLOVIMA KOJI SE OBAVLJAJU U SREDNJOŠKOLSKOJ USTANOVI** dostupno na http://www.propisi.hr/print.php?id=10808; primjer pravilnika o sistematizaciji radnih mjesta u srednjoj školi raspoloživ na http://gogss.hr/wp-content/uploads/2019/01/PRAVILNIK_O_SISTEMATIZACIJI_RADNIH_MJESTA.pdf (pregledano 1.6.21)

[38] Članak 48-59 Zakona o odgoju i obrazovanju u osnovnoj i srednjoj školi dostupan na https://www.zakon.hr/z/317/Zakon-o-odgoju-i-obrazovanju-u-osnovnoj-i-srednjoj-%C5%A1koli(pregledano 1.6.21)

[39] Članak 20-33 Zakona o strukovnom obrazovanju dostupno na https://www.zakon.hr/z/383/Zakon-o-strukovnom-obrazovanju (pregledano 1.6.21)

[40] Dostupno na https://www.zakon.hr/cms.htm?id=2731 (pregledano 1.6.21)

[41] Upitnik o općim menadžerskim vještinama dostupan je na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf, str. 19. (pregledano 1.6.21)

[42] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, kolovoz, 2020. dostupno na https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (pregledano 1.6.21)

prema Sikavica,P.; Bahtijarević-Šiber, F.; Pološki Vokić,N.: Temelji menadžmenta, Školska knjiga, Zagreb, 2008., str. 755-757.

obrazovnog procesa ali i pratećih aktivnosti i uvjeta rada (primjerice realizacija projekta, kurikuluma, godišnjeg plana i programa rada škole, provođenje mjera zaštite na radu itd.).[43] Naravno, uz prethodno navedeno, škole i njihovi ravnatelji podliježu i kontrolama izvan škole. Tako primjerice, što je u djelokrugu provedbe nadzora u ustanovama i drugim pravnim osobama koje podliježu nadzoru prosvjetne inspekcije a što je u djelokrugu inspekcije rada može se detaljnije vidjeti u Zakonu o prosvjetnoj inspekciji[44] i Zakonu o inspektoratu rada.[45] Da bi se ravnatelji mogli uspješno nositi s raznovrsnim zadacima kontrole, tablica 1 prikazuje popis formalno pravnih uporišta kontroliranja.

Tablica 1 Popis pravilnika, zakona i ostalih akata

Zakoni , uredbe, standardi, kolektivni ugovori	**Pravilnici a)**	**Pravilnici b)**	**Pravilnici c)**	**Interni opći akti**	**Mogući postupci**
Zakon o odgoju i obrazovanju u osnovnoj i srednjoj školi, Zakon o zaštiti od nasilja u obitelji, , Zakon o ustanovama, , Zakon o radu, , Zakon o zaštiti na radu, Zakon o zaštiti od požara, Zakon o ograničavanju uporabe duhanskih i srodnih proizvoda, Zakon o posredovanju pri	Pravilnik o zajedničkom upisniku školskih ustanova u elektroničkom obliku- e Matici, Pravilnik o pomoćnicima u nastavi i stručnim komunikacijski m posrednicima, Pravilnik o napredovanju učitelja, nastavnika, stručnih suradnika i ravnatelja u osnovnim i	Pravilnik o normi rada nastavnika u srednjoškolsko j ustanovi, Pravilnik o stručnoj spremi i pedagoško-psihološkom obrazovanju nastavnika u srednjem školstvu, Pravilnik o polaganju stručnog ispita učitelja i stručnih suradnika u osnovnom školstvu i nastavnika u srednjem	Pravilnik o načinima, postupcima i elementima vrednovanja učenika u osnovnoj i srednjoj školi, Pravilnik o načinu organiziranja i izvođenja nastave u strukovnim školama, Pravilnik o kriterijima za izricanje pedagoških mjera, Pravilnik o izradbi i obrani završnog rada, Pravilnik o	Godišnji plan i program rada škole, Školski kurikulum, Statut, Pravilnik o kućnom redu, Etički kodeks neposrednih nositelja odgojno-obrazovne djelatnosti, Pravilnik o radu, Pravilnik o zaštiti na radu, Pravilnik o provedbi postupaka jednostavne nabave, Pravilnik o	Upisi u 1. razred, planiranje školske godine; izvedba nastave; analiza rizika; ocjenjivanje; razrednički poslovi; izrada i obrana završnog rada; školska knjižnica; održavanje; kadrovski poslovi; tajnički poslovi; nabava; računovodstve ni poslovi;

[43] Ibid.
[44] Zakon o prosvjetnoj inspekciji dostupan na https://narodne-novine.nn.hr/clanci/sluzbeni/2011_06_61_1351.html (pregledano 1.6.21)

[45] https://www.zakon.hr/z/710/Zakon-o-inspektoratu-rada (pregledano 1.6.21)

zapošljavanju i pravima za vrijeme nezaposlenosti, Zakon o poticanju zapošljavanja, Zakon o hrvatskim braniteljima iz Domovinskog rata i članovima njihovih obitelji, Zakon o javnoj nabavi, Obiteljski zakon, Zakon o obveznim odnosima, Kazneni zakon, Temeljni kolektivni ugovor za službenike i namještenike u javnim službama, Kolektivni ugovor za zaposlenike u srednjoškolski m ustanovama, Zakon o pravu na pristup informacijama, Zakon o provedbi Opće uredbe o zaštiti podataka, Uredba o uredskom poslovanju,	srednjim školama i učeničkim domovima, Pravilnik o nagrađivanju učitelja, nastavnika, stručnih suradnika i ravnatelja u osnovnim i srednjim školama i učeničkim domovima, Pravilnik o utvrđivanju kvote za zapošljavanje osoba s invaliditetom, Pravilnik o pedagoškoj dokumentaciji i evidenciji te javnim ispravama u školskim ustanovama Pravilnik o načinima i postupcima i elementima vrednovanja učenika u osnovnoj i srednjoj školi, Akcijski plan za prevenciju nasilja u školama za razdoblje od 2020. do 2024.,	školstvu, Pravilnik o pedagoškoj dokumentaciji i evidenciji te javnim ispravama u školskim ustanovama, Pravilnik o djelokrugu tajnika te administrativn o-tehničkim i pomoćnim poslovima koji se obavljaju u srednjoškolsko j ustanovi, Pravilnik o načinu postupanja odgojno-obrazovnih radnika školskih ustanova u poduzimanju mjera zaštite prava učenika te prijave svakog kršenja tih prava nadležnim tijelima,	polaganju državne mature, Pravilnik o dopuni Pravilnika o polaganju državne mature, Pravilnik o uvjetima i načinima nastavka obrazovanja za višu razinu kvalifikacije, Pravilnik o izvođenju izleta, ekskurzija i drugih odgojno-obrazovnih aktivnosti izvan škole, Pravilnik o osnovnoškolsko m i srednjoškolsko m odgoju i obrazovanju učenika s teškoćama u razvoju, Pravilnik o pedagoškoj dokumentaciji i evidenciji te javnim ispravama u školskim ustanovama Pravilnik o zvanjima i svjedodžbama o osposobljenosti pomoraca, Pravilnik o	čuvanju, korištenju, odabiranju i izlučivanju arhivskog i registraturnog gradiva, Pravilnik o radu školske knjižnice, Pravilnik o zaštiti od požara, Pravilnik o zaštiti, obradi i korištenju osobnih podataka, Poslovnik o radu školskog odbora, Poslovnik o radu Školskih vijeća, Poslovnik o radu školskih sportskih društava, Poslovnik o radu Prosudbenog odbora i Povjerenstva za obranu završnog rada, Antikorupcijs ki program rada i djelovanja škole, Pravilnik o načinu i postupku	upravljanje dokumentirani m informacijama; pedagoške mjere; komunikacija.

Zakon o proračunu, Zakon o fiskalnoj odgovornosti, Zakon o porezu na dohodak, Zakon o općem upravnom postupku, Zakon o upravnim pristojbama, Uredba o tarifi upravnih pristojbi, Zakon o strukovnom obrazovanju, Zakon o prosvjetnoj inspekciji, Zakon o stručno-pedagoškom nadzoru, Zakon o hrvatskom kvalifikacijskom okviru, Državni pedagoški standard srednjoškolskog sustava odgoja i obrazovanja, , Zakon o knjižnicama i knjižničnoj djelatnosti, Zakon o udžbenicima i drugim obrazovnim	Pravilnik o polaganju državne mature, Pravilnik o dopuni Pravilnika o polaganju državne mature, Pravilnik o obavljanju djelatnosti u vezi sa zapošljavanjem , Pravilnik o proračunskom računovodstvu i računskom planu,		izmjenama i dopunama Pravilnika o zvanjima i svjedodžbama o osposobljenosti pomoraca	zapošljavanja u školu	

materijalima za osnovnu i srednju školu,					

Izvor: prilagodba autora prema www.nn.hr i internoj dokumentaciji odgojno obrazovnih ustanova dostupnoj na web stranicama škola

3. SPECIFIČNOSTI UPRAVLJANJA SREDNJOM STRUČNOM ŠKOLOM S OSVRTOM NA SEKTOR PROMETA I LOGISTIKE

Specifičnosti upravljanja srednjom stručnom školom s naglaskom na sektor prometa i logistike, za potrebe ovog rada, razmatrat će se kroz praćenje i prilagodbu aktualnim kretanjima izvana i to kroz : upisnu politiku i potrebe tržišta rada, nove standarde zanimanja, natjecanja učenika, upravljanje kvalitetom i specifičnim iskustvima on line nastave u uvjetima korona krize. Vezano za potrebe tržišta rada i upisne politike nasuprot obrazovnom profilu zaposlenih u strukovnim srednjim školama, polazni pravni okvir ove tematike čini Zakon o odgoju i obrazovanju u osnovnoj i srednjoj školi,[46] gdje prema članku 22., u stavku 5 stoji kako „ strukturu razrednih odjela i broj učenika po programima za svoje područje planiraju osnivači u suradnji sa srednjim školama te ga dostavljaju Ministarstvu“, a prema stavku 7 …“odluku o upisu , čiji je sastavni dio konačan plan strukture razrednih odjela i broj učenika po programima, za svaku školsku godinu donosi ministar.” Međutim, važno je napomenuti kako bi upisna politika zapravo trebala biti interakcija više sudionika tržišta rada s ciljem planiranja upisa u programe srednjih škola koje su potrebne gospodarstvu. Važniji dionici ovog složenog procesa su: učenici osmih razreda, roditelji učenika osmih razreda osmih razreda, osnovne škole, sustavi profesionalnog informiranja, osnivači srednjih škola, Ministarstvo obrazovanja, Ministarstvo gospodarstva, Ministarstvo rada, Hrvatska gospodarska komora, Hrvatska obrtnička komora, Hrvatski zavod za zapošljavanje, udruge poslodavaca, sindikati, Gospodarsko-socijalna vijeća, Agencija za strukovno obrazovanje i obrazovanje odraslih (ASOO) i dr. Međutim, od istaknutijih problema upisne politike može se izdvojiti sljedeće: neodgovarajuća profesionalna orijentacija / profesionalno informiranje / karijerno savjetovanje u osnovnim i srednjim školama, izostanak vanjskog vrednovanja u osnovnim školama (“mala matura”), višak upisnih mjesta u odnosu na broj učenika, kratki rok izrade plana upisa, veći broj upisnih mjesta u strukovnim programima u odnosu na broj licenciranih mjesta u obrtima i poduzećima, imidž strukovnih zvanja, neadekvatan sustav informiranja o deficitarnim i propulzivnim zanimanjima, nesklad ponude i potražnje na tržištu rada, nedovoljna uključenost gospodarskih subjekata u izradu planova upisa i pružanje potpore za održavanje i organizaciju praktične nastave, nefleksibilnost škola (posebice kroz prilagođavanje obrazovnih programa postojećim zaposlenicima), izostanak sustavnog praćenja nakon završetka školovanja, nedostatne, nedostupne i neusklađene baze podataka. S druge strane, ne smije se zanemariti činjenica kako su nastavnici zaposleni u stručnim srednjim školama često puta usko specijalizirani, a s druge strane kadrovski uvjeti za izvođenje određenih nastavnih predmeta unutar određenih obrazovnih programa striktno su definirani, ponekad čak i nelogično neusklađeni u međusobnoj usporedbi sličnih obrazovnih programa. Sve to stvara višestruku nefleksibilnost sustava u otvorenosti prema novim zanimanjima kojima bi se srednje škole mogle orijentirati u budućnosti. Istovremeno, i sama privlačnost zanimanja nastavnika stručnih predmeta opada, kako zbog velikih tjednih normi, tako i zbog uvjeta prikrivenog rada iznad norme zbog zahtjevnosti priprema velikog broja raznovrsnih

[46] https://www.zakon.hr/z/317/Zakon-o-odgoju-i-obrazovanju-u-osnovnoj-i-srednjoj-%C5%A1koli (pregledano 1.6.21.)

predmeta i raznovrsnosti programa koji ne nose gotovo nikakve bonuse s jedne strane i velike neizvjesnosti i nesigurnosti sklopljenih ugovora o radu, s druge strane.

Vezano za nove standarde zanimanja, standarde kvalifikacije i kurikulume, koji bi ipak trebali donijeti pozitivne promjene, kako se navodi na stranicama ASOO,[47] projekt **"Modernizacija sustava strukovnog obrazovanja i osposobljavanja"** kao temeljnu svrhu ima upravo razvoj strukovnog obrazovanja i osposobljavanja koje bi trebalo biti privlačno, inovativno, relevantno, povezano s tržištem rada te koje će omogućiti polaznicima stjecanje kompetencija za osobni i profesionalni razvoj ali i nastavak obrazovanja i cjeloživotno učenje. Smatra se kako će navedeno biti ostvareno kroz ispunjenje specifičnih ciljeva projekta i to razvoja inovativnih i fleksibilnih sektorskih i strukovnih kurikuluma temeljenih na potrebama tržišta rada te jačanja kompetencija odgojno-obrazovnih djelatnika za uvođenje i provedbu kurikuluma. Pri tome bi pristup sektorskih kurikuluma koje će razviti ASOO, trebao dovesti do racionalizacije broja kurikuluma, omogućiti učenicima lakše uključivanje na tržište rada, bolju horizontalnu prohodnost, profesionalni razvoj ali i nastavak obrazovanja. Veliki naglasak stavlja se na fleksibilnost i autonomiju škola uključujući i razvoj priručnika i pomoćnih nastavnih sredstava, dok se kroz kontinuirane medijske kampanje planira podići i vidljivost strukovnog obrazovanja u društvu, u prvom redu među budućim učenicima i roditeljima, ali i među poslodavcima i široj javnosti. Stoga je kroz 2021.g planiran dovršetak niza ključnih dokumenata i koraka radi uvođenja novih kurikuluma u sve ustanove za strukovno obrazovanje u Republici Hrvatskoj uz pružanje podrške ravnateljima, nastavnicima, stručnim suradnicima za uvođenje, provedbu i praćenje sektorskih kurikuluma kroz kontinuirana usavršavanja, radionice, posjete, edukacije te izradu i objavu priručnika za nastavnike i drugih obrazovnih materijala u digitalnom i/ili tiskanom obliku. Inače, unutar samog sektora prometa, od listopada 2019., u tijeku je izrada novih standarda zanimanja u području vožnje motornog vozila, prometne logistike, željeznice i zrakoplovstva.[48]

Vezano za natjecanja učenika, kako se ističe na stranicama ASOO, unatrag tri godine, novi model državnih natjecanja i smotri učenika strukovnih škola provodi se pod imenom Državno natjecanje učenika strukovnih škola – *WorldSkills Croatia* kojim se promiče strukovno obrazovanje, razvoj karijere, važnost vještina, međunarodna suradnja i osigurava bolja vidljivost hrvatskih natjecanja učenika strukovnih škola ne samo na nacionalnoj već i na međunarodnoj razini.[49] Što se tiče kvalitete ustanove i samovrjednovanja, kako se navodi u Priručniku za samovrjednovanje[50], struktura hrvatskoga sustava osiguranja kvalitete podijeljena je u 6 prioritetnih područja koja pokrivaju područja kvalitete kojima se trebaju baviti ustanove za strukovno obrazovanje. U Priručniku za samovrjednovanje se ističe kako jednom utvrđene potrebe korisnika (npr. polaznika, poslodavaca) treba pretvoriti u parametre, kako bi se moglo izmjeriti zadovoljavaju li aktivnosti i procesi ustanove za strukovno obrazovanje te potrebe. Stoga, svako prioritetno područje podijeljeno je u područja kvalitete koja su dalje definirana nizom kriterija kvalitete koji određuju standard i razinu aktivnosti i procesa u strukovnom obrazovanju i osposobljavanju. Aplikacija za podršku strukovnim školama u provedbi procesa samovrjednovanja i izradi Izvješća o samovrjednovanju je „e-Kvaliteta", dok su u samim školama za samovrjednovanje posebno zaduženi Koordinator samovrjednovanja, Povjerenstvo za kvalitetu, ravnatelji i Školski odbor.[51] U posljednje vrijeme jedna od aktualnih tema je i stručno usavršavanje nastavnika strukovnih predmeta, posebno zahtjevna zbog prethodno diskutiranog problema preopterećenosti

[47] https://www.asoo.hr/projekti-i-suradnja/esf-projekti/modernizacija-sustava-strukovnog-obrazovanja-i-osposobljavanja/(pregledano 1.6.21)

[48] Odluka o koordinatorima i članovima radnih skupina za izradu novih standarda zanimanja u sektoru Promet i logistika dostupna je na https://www.asoo.hr/UserDocsImages/Odluke%20po%20PJP/Odluka%20-%20Promet%20i%20logistika.pdf (pregledano 1.6.21)

[49] O natjecanjima vidjeti više na https://www.asoo.hr/obrazovanje/strukovno-obrazovanje/natjecanja-ucenika-strukovnih-skola/ i www.worldskillscroatia.hr (pregledano 1.6.21)

[50] Razvojni tim ASOO : Hrvatski okvir za osiguranje kvalitete u strukovnom obrazovanju i osposobljavanju / Priručnik za samovrjednovanje, RD DIGITAL d.o.o., Zagreb, 2011. str. 13. dostupno na https://www.asoo.hr/UserDocsImages/Priru%C4%8Dnik%20za%20samovrjednovanje.pdf (pregledano 1.6.21)

[51] Vidjeti više na https://www.asoo.hr/osiguravanje-kvalitete/strukovno-obrazovanje/e-kvaliteta/ (pregledano 1.6.21)

nastavnika struke. Kako se navodi na stranicama ASOO,[52] upravo „Projekt "**Modernizacija sustava stručnog usavršavanja nastavnika strukovnih predmeta**" sufinanciran iz Europskog socijalnog fonda, čiji je nositelj ASOO, trebao bi omogućiti značajan pomak i razvoj inovativnog, otvorenog i fleksibilnog sustava stručnog usavršavanja strukovnih nastavnika utemeljenog na istraženim potrebama, relevantnim sadržajima, modernim metodama izvođenja nastave, suvremenim IT alatima i rješenjima, kako bi se strukovnim nastavnicima kao ciljnoj skupini projekta osigurala bolja podrška i kvalitetnije mogućnosti za jačanje nastavničkih kompetencija i tako podigla kvaliteta poučavanja i učeničkih postignuća, ali i sam kapacitet za provedbu reformi u strukovnom obrazovanju"[53]. Istovremeno, tema koja je posljednje dvije akademske i školske godine posebno zaokupila znanstveno-stručnu javnost zasigurno je *kriza obrazovanja uzrokovan korona krizom*. Kako generalno navode u Hrvatskoj akademskoj zajednici,[54] a isto je primjenjivo i na srednje škole uključivo i sektor prometa i logistike, nastava na daljinu u obliku u kakvom je početno uspostavljena u Hrvatskoj spadala je u kategoriju „hitne" nastave a ne učinkovite *online* nastave koja je rezultat kontinuiranog razvoja e-učenja. Također uočeno je kako učenje na daljinu nije jednako primjenjivo i učinkovito na svim razinama obrazovne vertikale te kako se i za osnovne i srednje škole kao puno bolje rješenje pokazalo održavanje nastave u stvarnom vremenu, prema standardnom rasporedu sati uz mogućnost interakcije. Ipak, utvrđene su velike razlike u kvaliteti nastave od institucije do institucije, a posebno je bila problematična *online* alternativa praktične nastave. Općenito bila je smanjena interaktivnost između učenika i studenata, komunikacija na relaciji nastavnik-učenik često je bila jednosmjerna a tehnička zahtjevnost provedbe on line nastave visoka. Pojavio se i problem provjere znanja na daljinu kao i problemi s povećanom anksioznošću i depresijom među nekim učenicima i studentima, smanjenje motivacije učenika, nastavnika i profesora. Prethodno navedeno zapravo samo praktično potvrđuje prednosti i nedostatke e-obrazovanja koji su se aktualizirali još prije desetak godina, posebice sa značajnijim prodorom e tehnologija u obrazovanje.[55] Stoga, može se zaključiti da iako nove tehnologije, posebice informatičke, nude velike mogućnosti u obrazovanju, ipak praksa pokazuje kako je direktni kontakt s obrazovnim stručnjacima nezamjenjiv u odnosu na kontakt putem elektroničke tehnologije i o tome itekako treba voditi računa u planiranju obrazovne budućnosti, posebice u specifičnom i zahtjevnom sektoru prometa i logistike.[56]

ZAKLJUČAK

U ovom radu razmatrani su opći pojmovi i funkcije menadžmenta te specifičnosti upravljanja srednjom stručnom školom s naglaskom na sektor promet i logistika. Spoznaje o menadžmentu uopće i menadžmentu u srednjim strukovnim školama formirale su se uočavanjem njihovih sastavnih dijelova i međusobnih odnosa. Na temelju postojećih znanja o općim svojstvima pojave koja podrazumijeva poznavanje općih stavova i načela menadžmenta s naglaskom na školski menadžment, u radu se razlučilo opće od pojedinačnog i posebnog i utvrdilo da ne postoji značajnije odstupanje karakterističnih sastavnica modernog

[52] https://www.asoo.hr/projekti-i-suradnja/esf-projekti/modernizacija-sustava-strucnog-usavrsavanja-nastavnika-strukovnih-predmeta/
[53] O novom konceptu usavršavanja nastavnika strukovnih predmeta vidjeti više na https://www.asoo.hr/UserDocsImages/Projekt%20usavr%C5%A1avanja/Koncept_novoga_modela.pdf (pregledano 1.6.21 i https://edu.asoo.hr/(pregledano 1.6.21)

[54] https://www.haz.hr/izvodenje-nastave-na-daljinu/(pregledano 1.6.21)

[55] Vidjeti više u Barabaš, Seršić S.; Glavan, F.: Upravljanje promjenama, Zbornik radova «Ravnatelj škole – upravljanje – vođenje» Agencija za odgoj i obrazovanje, Zagreb, 2009. i Bačelić, Z.: Ljudski resursi i cjeloživotno učenje – ključ modernog menadžmenta u prometu, VI. MEĐUNARODNI SIMPOZIJ INTERDISCIPLINARNOST PROMETA I LOGISTIKE, Škola za cestovni promet, Zagreb, listopad, 2015.

[56] Fitz-enz, J.; Davison, B.: How to measure human resources management, McGraw-Hill, New York, 2002.

menadžmenta uopće i menadžmenta u srednjim strukovnim školama. Rad istovremeno predstavlja teorijsko-spoznajni odraz originalnosti, zbog utvrđivanja povezanosti sa specifičnim područjem menadžmenta u strukovnim srednjim školama, posebice koje obrazuju učenike u sektoru promet i logistika.

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http://www.propisi.hr/print.php?id=10808 (pregledano 1.6.21)
https://narodne-novine.nn.hr/clanci/sluzbeni/2011_06_61_1351.html (pregledano 1.6.21)
https://www.zakon.hr/z/710/Zakon-o-inspektoratu-rada (pregledano 1.6.21)

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Abstract

The full implementation of management in the education system improves the practice of managing educational institutions and its processes. Ultimately, the strengthening of the competencies of managers in education for the management of an educational organization is achieved. This should contribute to the improvement of working conditions, more efficient problem solving, strengthening the image of the educational organization, strengthening the motivation of employees, but also greater satisfaction of final stakeholders of educational services (parents and students). The ultimate goal of successful management in vocational education is to achieve the best possible educational *output* and knowledge for the labor market and the possibility of rapid employability of students in the role of future employees, but also long-term stability of the school's position in the market of educational services. It can be concluded that management in vocational education has, in a specific way, stronger long-term implications for the socio-economic development of society as a whole, but also greater risk-susceptibility, and it needs to be given due attention. Therefore, in this paper, the focus is precisely on management in the vocational education system. The paper will discuss the functions of management with an emphasis on the challenges of managing a vocational secondary school that educates students in the transport and logistics sector in the context of current trends.

Keywords: management, education, traffic, management functions

INTRODUCTION

This paper is based on a basic research question about the foundation of modern school management with an emphasis on the specifics of vocational schools and schools that educate students in the transport and logistics sector. Therefore, the main purpose of this paper is to raise awareness of the importance of management in the daily operation of organizational systems of vocational secondary schools, while the topic of the paper is to consider the components of modern management, with the establishment of a connection with vocational schools in general and secondary vocational schools in the transport and logistics sector, in order to determine and research their scientific-applied background and try to create a new integrated unit. This is also one of the fundamental scientific goals of this paper. Based on the previously presented starting points, it is possible to set the basic working hypothesis of this paper, which states that:*„ The approach and outcomes of management in vocational secondary schools are closely related to the*

approach and outcomes of general modern management". The methods of scientific research that will be used in this paper are: analysis, synthesis, induction, deduction and modeling.

1. BASIC MANAGEMENT

Management is represented in almost all areas of human activity, so we can talk about management in education, sports management, tourism management, transport management, health management, project management, marketing management, etc. Most definitions of management speak of the ability to plan, organize, lead and control.[57] Therefore, the focus of management is precisely on its functions. The reason for the large number of classifications and definitions is due to the complexity of concepts, various philosophical approaches, theoretical determinants and diversity of practice in management. Buble lists five basic management functions: planning, organizing, staffing, directing and controlling.[58] Sikavica and associates include management functions: planning, organizing, directing, human resources management and controlling.[59] There are different types of management. When we talk about types of management, it is common to consider them from the aspect of levels and from the aspect of the scope of responsibilities. From the aspect of levels, the following are distinguished: top management (highest level), middle management (middle level), lower management (first level).[60] Top management is responsible for the organization as a whole, it is focused on the strategy and goals of the business and finding ways to engage all the resources of the organization to achieve top results. Middle management implements business strategies and policies defined by top management. Senior management is responsible for achieving "daily", operational tasks, providing technical assistance and applying rules and procedures to achieve business efficiency. Management is often seen as both operational and strategic. Operational management is focused on the present time or the near future and the realization of what is defined within the strategic management. On the other hand, strategic management is focused on long-term while respecting and adapting to different environmental influences. The school environment can be considered through three segments[61]: General (social) environment [general political, economic, social and technological trends and relations]; Business environment [founders, local community; Ministry of Science and Education, Agency for Vocational and Adult Education, Education Agency, beneficiaries, donors, sponsors, collaborative and competitive schools, employees, volunteers of various state bodies, etc.]; Internal environment [material, human and information resources; organizational culture and organizational structure].

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57 About management see more in Sikavica, P.; Bahtijarević-Šiber F: Menadžment: Teorija menadžmenta i veliko empirijsko istraživanje u Hrvatskoj, Masmedia, Zagreb, 2004. p.17.-21.

58 Buble, M.: Menadžment, Ekonomski fakultet u Splitu, Split 2009., p. 11.

59 Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, August, 2020. available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (accessed on 1.6.21)

according to Sikavica,P.; Bahtijarević-Šiber, F.; Pološki Vokić,N.: Temelji menadžmenta, Školska knjiga, Zagreb, 2008., p.20.-23.

60 Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, August, 2020. available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf(accessed on 1.6.21)

according to Buble,M.: Menadžment, Sveučilište u Splitu, Ekonomski fakultet Split, Split, 2009., p.10

61 Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, August, 2020. available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (accessed on 1.6.21)

according to Alfirević, N; Pavičić,J; Kutleša, M; Matković, J.: Osnove strateškog marketinga i menadžmenta u osnovnim i srednjim školama, Alfa d.d. Zagreb, Zagreb, 2010., p.29.-30.

2.MANAGEMENT FUNCTIONS

When it comes to management functions, they are most often considered through planning, organizing, directing and controlling. As far as *planning* is concerned, different definitions of planning have in common one thing and that is planning which is a formal process aimed at establishing set goals and choosing strategies for their achievement. For effective planning it is necessary to answer the following questions: where our organization (school) is currently located; where we want to find ourselves in the future and how to achieve this, while taking into account the limited resources and the uncertainty of the environment.[62] Also, since planning is a complex and creative process, it is necessary to take concrete steps, namely: a) situational analysis; b) goal setting; c) development of planning premises (what costs, what technology, etc.); d) identifying alternatives; f) evaluation of alternatives; g) choice of alternatives; h) formulation of implementation plans; i) defining the budget. The issue of responsibility for planning should be added to the above. Among the most important plans in secondary education organizations are: Annual plan and work program of the school, Annual plan and work program of pedagogues, Annual plan and work program of principals, Annual plan and work program of various professional bodies (e.g. professional councils) and at the level of teachers are annual performance curricula for each subject. The vision, mission and goals of the organization are closely related to the planning process, so they are also an indispensable topic in this area. Vision comes from the Latin word *visio* which means appearance, presentation, but in the context of management it means a picture of the future that should be realistic and credible, but also attractive, not only to users of products or services but also to employees themselves. Therefore, the vision has two components: a basic ideology (focused on purpose and value) and a predictable future.[63] The mission should also be motivating for employees and contain basic policies that the organization supports. Also, the emphasis is not on words but on activities, focus on people and building trust.[64] As for the goals, it is important to emphasize that they have their own hierarchy, so the key factors would be general organizational goals, the goals of individual organizational units, or the goals of the individual. Furthermore, goals can be strategic or long-term and short-term, simple and complex, strategic and operational. However, it is important to respect the so-called SMART[65] criteria according to which goals should be specific, measurable, encourage action, realistic and achievable in a certain defined time.[66] As for *organizing*, there are many definitions of organizing, but what they have in common is that organizing is actually connecting people and resources in which the goals of the organization are achieved, while respecting certain rules of organizational behavior.[67] In doing so, one of the most important dimensions of the organization is coordination as the connection of divided and then grouped tasks in order to achieve the goals of the organization. There is also the issue of delegating tasks and responsibilities and making decisions.[68] In this sense, in schools as organizations, it is

[62] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, August, 2020, available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (accessed on 1.6.21) according to Buble,M.: Menadžment, Ekonomski fakultet Split, Sinergija d.o.o., Zagreb, 2006., p.109.-110.

[63] Op.cit.p.123.-124.
[64] Ibid.p.130.
[65] SMART the abbreviation comes from a word of English origin: specific, measurable, action oriented, realistic, time limited, in translation as above in the text.
[66] Ibid.p.137.
[67] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, August, 2020. available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (accessed on 1.6.21)

according to Sikavica,P.; Bahtijarević-Šiber, F.; Pološki Vokić,N.: Temelji menadžmenta, Školska knjiga, Zagreb, 2008., p.292.-294.
[68] Op.cit. p.339.

very important to know the laws and regulations that define the responsibilities and scope of work of school principals, school secretaries, accountants and other support staff, but also that schools, in accordance with the law, adopt regulations on systematization of workplaces.[69] The organization of the work of the vocational school, among the most important laws and bylaws, is regulated by the Law on Education in Primary and Secondary Schools [70], Law on Vocational Education,[71] and the Ordinance on the manner of organizing and conducting classes in vocational schools.[72] *Leadership* skills are considered to be primarily related to the personality of each individual manager, and, as Sikavica et al. say, it is:…" the art of influencing people so that they willingly and enthusiastically strive to achieve the goals of the organization." What is important to note in this regard is that in modern conditions of rapid change, the heads of organizations and schools should be not only managers but also leaders.[73] *Control* is a kind of comparison of what is planned and achieved in order to take corrective action in case of need or major deviations. It is closely related to the planning itself.[74] Namely, in order to be able to control, it is necessary to start from what is planned and what goals need to be achieved. Therefore, control is important to limit the accumulation of errors and successfully deal with the complexity of the business. Control by principals of secondary education organizations can take place at different levels from control / records of working hours of employees, implementation of class schedules and operational plans and programs of teachers to records in the e - register, but also everything else from the scope of work and duties of principals, educational process but also accompanying activities and working conditions (for example, implementation of the project, curriculum, annual plan and program of school work, implementation of safety measures at work, etc.).[75] In addition to the above, schools and their principals are also subject to controls outside the school. Thus, for example, what is within the scope of supervision in institutions and other legal entities that are subject to the supervision of the education inspection and what is within the scope of labor inspection can be seen in more detail in the Education Inspection Act[76] and the Labor Inspectorate Act.[77] In order for principals to be able to successfully handle a variety of control tasks, Table 1 lists the formal legal bases of control.

[69] **PRAVILNIK O DJELOKRUGU RADA TAJNIKA TE ADMINISTRATIVNO-TEHNIČKIM I POMOĆNIM POSLOVIMA KOJI SE OBAVLJAJU U SREDNJOŠKOLSKOJ USTANOVI** available at http://www.propisi.hr/print.php?id=10808; an example of an Ordinance on job systematization in secondary school available at http://gogss.hr/wp-content/uploads/2019/01/PRAVILNIK_O_SISTEMATIZACIJI_RADNIH_MJESTA.pdf (accessed on 1.6.21)

[70] Articles 48-59 of the Law on Education in Primary and Secondary School available at https://www.zakon.hr/z/317/Zakon-o-odgoju-i-obrazovanju-u-osnovnoj-i-srednjoj-%C5%A1koli(accessed on 1.6.21)

[71] Article 20-33 of the Vocational Education Act available at https://www.zakon.hr/z/383/Zakon-o-strukovnom-obrazovanju (accessed on1.6.21)

[72] Available at https://www.zakon.hr/cms.htm?id=2731 (accessed on 1.6.21)

[73] A questionnaire on general managerial skills is available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf, p. 19. (accessed on 1.6.21)

[74] Bačelić, Z.: OBRAZOVNI MATERIJAL ZA STRUČNO USAVRŠAVANJE NASTAVNIKA STRUKOVNIH PREDMETA, Modul: Osnove menadžmenta i menadžerske vještine MI10 (S3), Agencija za strukovno obrazovanje i obrazovanje odraslih, Zagreb, August, 2020. available at https://edu.asoo.hr/wp-content/uploads/2020/08/Obrazovni-materijal_Zorana-Ba%C4%8Deli%C4%87.pdf (accessed on 1.6.21)

according to Sikavica,P.; Bahtijarević-Šiber, F.; Pološki Vokić,N.: Temelji menadžmenta, Školska knjiga, Zagreb, 2008., p. 755-757.

[75] Ibid.

[76] The Education Inspection Act is available at https://narodne-novine.nn.hr/clanci/sluzbeni/2011_06_61_1351.html (accessed on 1.6.21)

[77] https://www.zakon.hr/z/710/Zakon-o-inspektoratu-rada (accessed on 1.6.21)

Table 1 List of regulations, laws and other acts

Laws, regulations, standards, collective agreements	**Ordinances a)**	**Ordinances b)**	**Ordinances c)**	**Internal general acts**	**Possible procedures**
Law on Education in Primary and Secondary Schools, Law on Protection from Domestic Violence, Law on Institutions, Labor Law, Law on Occupational Safety, Law on Fire Protection, Law on Restricting the Use of Tobacco and Related Products, Law on Employment Mediation and Rights during Unemployment, Law on Stimulating Employment, Law on Croatian Homeland War Veterans and Members of Their Families, Public Procurement Act, Family	Ordinance on the joint register of school institutions in electronic form („e –Matica"), Ordinance on teaching assistants and professional communication mediators, Ordinance on the promotion of teachers, professional associates and principals in primary and secondary schools and dormitories, Ordinance on rewarding teachers, professional associates and principals in primary and secondary schools and dormitories, Ordinance on determining	Ordinance on the norm of work of teachers in secondary schools, Ordinance on education and pedagogical-psychological education of teachers in secondary education, Ordinance on taking the professional exam for teachers and professional associates in primary education and teachers in secondary education, Ordinance on pedagogical documentation and records and public documents in school institutions, Ordinance on	Ordinance on the methods, procedures and elements of student evaluation in primary and secondary school, Ordinance on the manner of organizing and conducting classes in vocational schools, Ordinance on the criteria for imposing pedagogical measures, Ordinance on the preparation and defense of the final thesis, Ordinance on taking the state graduation exam, Ordinance amending the Ordinance on taking the state	Annual plan and program of work of the school, School curriculum, Statute, Ordinance on house rules, Code of ethics of direct holders of educational activities, Labour regulations, Ordinance on safety at work, Ordinance on implementation of simple procurement procedures, Ordinance on storage, use, selection and the extraction of archival and registry material, Ordinance on the work of the school library, Ordinance on fire protection, Ordinance on	Enrollment in 1st grade, school year planning; teaching; risk analysis; gradeing; class work; preparation and defense of the final paper; school library; maintenance; personnel affairs; secretarial work; procurement; accounting; management of documented information; pedagogical measures; communication.

Act, Civil Obligations Act, Criminal Code, Basic Collective Agreement for Civil Servants and Employees, Collective Agreement for Employees in Secondary Schools, Law on the Right to Access Information, Law on the Implementation of the General Regulation on Data Protection, Regulation on Office Operations, Budget Law, Law on Fiscal Responsibility, Law on Income Tax, Law on General Administrative Procedure, Law on Administrative Fees, Decree on Tariff of Administrative Fees, Law on Vocational Education, Law on Education Inspection, Law on Professional and	the quota for employment of persons with disabilities, Ordinance on pedagogical documentation and records and public documents in school institutions, Ordinance on methods and procedures and elements of evaluation of students in elementary and secondary school, Action plan for the prevention of violence in schools for the period from 2020 to 2024, Ordinance on taking the state graduation exam, Ordinance amending the Ordinance on taking the state graduation exam, Ordinance on performing activities related to employment, Ordinance on budget	the scope of the secretary and administrative-technical and auxiliary tasks performed in secondary schools, Ordinance on the manner of conduct of educational workers of school institutions in taking measures to protect the rights of students and reporting any violation of these rights to the competent authorities	graduation exam, Ordinance on the conditions and methods of continuing education for a higher level of qualification, Ordinance on conducting trips, excursions and other educational activities outside the school, Ordinance on primary and secondary education of students with disabilities, Ordinance on pedagogical documentation and records and public documents in school institutions Ordinance on titles and certificates of seafarers 'qualifications, Ordinance on amendments to the Ordinance on titles and certificates of	the protection, processing and use of personal data, Rules of procedure of the school board, Rules of procedure of school councils, Rules of procedure of school sports associations, Rules of Procedure of the Selection Committee and the Committee for the Defense of the Final Thesis, Anti-corruption program of work and activities of the school, Ordinance on the manner and procedure of employment in the school	

Pedagogical Supervision, Law on Croatian Qualifications Framework, State Pedagogical Standard of the Secondary Education System, Law on Libraries and Library Activity, Law on Textbooks and Other Educational Materials for Primary and Secondary School,	accounting and calculation plan		seafarers' qualifications		

Source: author's own adaptation according to www.nn.hr and internal documentation of educational institutions available on the school websites

3. SPECIFICS OF SECONDARY VOCATIONAL SCHOOL MANAGEMENT WITH REFERENCE TO THE TRANSPORT AND LOGISTICS SECTOR

Specifics of secondary vocational school management with emphasis on the transport and logistics sector, for the purposes of this paper, will be considered through monitoring and adaptation to current external trends through: enrollment policy and labor market needs, new occupational standards, student competitions, quality management and specific experiences of online teaching in the conditions of the corona crisis. Regarding the needs of the labor market and enrollment policy as opposed to the educational profile of employees in secondary vocational schools, the initial legal framework of this topic is the Law on Education in Primary and Secondary Schools,[78] where according to Article 22, paragraph 5 states that "the structure of classrooms and the number of students per program for their area is planned by the founders in cooperation with secondary schools and submitted to the Ministry ", and according to paragraph 7…"the decision on enrollment, of which the final plan of the structure of classrooms and the number of students by programs is an integral part, is made by the Minister for each school year." However, it is important to note that enrollment policy should actually be the interaction of multiple labor market participants with the goal of planning enrollment in secondary school programs needed by the economy. The most important stakeholders in this complex process are: eighth graders and their parents, primary schools, vocational information

[78] https://www.zakon.hr/z/317/Zakon-o-odgoju-i-obrazovanju-u-osnovnoj-i-srednjoj-%C5%A1koli (accessed on 1.6.21.)

systems, founders of secondary schools, Ministry of Education, Ministry of Economy, Ministry of Labor, Croatian Chamber of Commerce, Croatian Chamber of Trades and Crafts, Croatian Employment Service, employers' associations, trade unions, Economic and Social Councils, the Agency for Vocational Education and Training and Adult Education (AVETAE), etc. However, the most prominent problems of enrollment policy include the following: inadequate professional orientation / professional information / career counseling in primary and secondary schools, lack of external evaluation in primary schools, excess of enrollment places in relation to the number of students, short deadline for drafting the enrollment plan, higher number of enrollment places in vocational programs in relation to the number of licensed places in crafts and companies, image of vocational ocupations, inadequate information system on deficit and propulsive occupations, mismatch of supply and demand in the labor market, insufficient involvement of economic entities in drafting enrollment plans and support for the maintenance and organization of practical classes, inflexibility of schools (especially through the adaptation of educational programs to existing employees), lack of systematic monitoring after graduation, insufficient, inaccessible and uncoordinated databases. On the other hand, we should not ignore the fact that teachers employed in vocational secondary schools are often deeply specialized, and on the other hand the staffing conditions for certain subjects within certain educational programs are strictly defined, sometimes even illogically inconsistent in comparing similar educational program. All this creates a multiple inflexibility of the system in openness to new occupations that secondary schools could orient in the future. At the same time, the attractiveness of the profession of vocational subject teachers is declining, both due to large weekly norms and the conditions of covert work above the norm due to the complexity of preparing a large number of diverse subjects and a variety of programs which carry almost no bonuses on the one hand and great uncertainty of concluded employment contracts, on the other hand. Regarding the new occupational standards, qualification standards and curricula, which should bring positive changes, as stated on the pages of the AVETAE,[79] the project "Modernization of the vocational education and training system" has as its main purpose the development of vocational education and training that should be attractive, innovative, relevant, related to the labor market and which will enable participants to acquire competencies for personal and professional development, but also to continue their education and lifelong learning. It is believed that this will be achieved through meeting the specific objectives of the project, namely the development of innovative and flexible sectoral and vocational curricula based on the needs of the labor market and strengthening the competencies of educators to introduce and implement curricula. At the same time, the approach of sectoral curricula that will be developed by the AVETAE should lead to the rationalization of the number of curricula, enable easier student inclusion in the labor market, better horizontal mobility, professional development and continuing education. Great emphasis is placed on the flexibility and autonomy of schools, including the development of manuals and teaching aids, while through continuous media campaigns it is planned to raise the visibility of vocational education in society, primarily among future students and parents, but also among employers and the general public. Therefore, through 2021 it is planned to complete a series of key documents and steps to introduce new curricula in all vocational education institutions in the Republic of Croatia by providing support to principals, teachers, professional associates for the introduction, implementation and monitoring of sectoral curricula through continuous training, workshops, visits, education, development and publication of manuals for teachers, and other educational materials in digital and / or printed form. Within the transport sector itself, since October 2019, the development of new occupational standards in the field of motor vehicle driving, transport logistics, railways and aviation is underway.[80] Regarding student

[79] https://www.asoo.hr/projekti-i-suradnja/esf-projekti/modernizacija-sustava-strukovnog-obrazovanja-i-osposobljavanja/ (accessed on 1.6.21)

[80] The decision on coordinators and members of working groups for the development of new occupational standards in the Transport and Logistics sector is available at https://www.asoo.hr/UserDocsImages/Odluke%20po%20PJP/Odluka%20-%20Promet%20i%20logistika.pdf (accessed on 1.6.21)

competitions, as pointed out on the AVETAE website, three years ago, a new model of national competitions and festivals of vocational school students was conducted under the name National Vocational School Competition - *WorldSkills Croatia* which promotes vocational education, career development, importance of skills, international cooperation and ensures better visibility of Croatian competitions for vocational school students not only at the national but also at the international level.[81] Regarding the quality of the institution and self-evaluation, as stated in the Manual for Self-Evaluation[82], the structure of the Croatian quality assurance system is divided into 6 priority areas covering the areas of quality to be addressed by vocational education institutions. The Self-Evaluation Manual points out that once identified, the needs of users (e.g. students, employers) should be converted into parameters, in order to be able to measure whether the activities and processes of the vocational education institution meet these needs. Therefore, each priority area is divided into quality areas which are further defined by a series of quality criteria that determine the standard and level of activities and processes in vocational education and training. The application for support to vocational schools in the implementation of the self-evaluation process and the preparation of the Self-Evaluation Report is "e-Quality", while in the self-evaluation schools themselves the Self-Evaluation Coordinator, the Quality Committee, principals and the School Board are in charge.[83] Recently, one of the current topics is the professional development of teachers of vocational subjects, especially demanding due to the previously discussed problem of overload of teachers. According to the AVETAE website,[84] the "Project" Modernization of the Professional Development System for Vocational Teachers "co-financed by the European Social Fund, whose developer is the AVETAE, should enable a significant shift and development of an innovative, open and flexible system of professional development based on research needs, relevant content, modern teaching methods, modern IT tools and solutions, in order to provide vocational teachers as a target group of the project better support and better opportunities to strengthen teacher competencies and thus raise the quality of teaching and student achievement, but also the capacity to implement reforms in vocational education"[85]. At the same time, a topic that has particularly occupied the scientific and professional public in the last two academic and school years is certainly *the crisis of education caused by the corona crisis*. As generally stated in the Croatian academic community,[86] and the same applies to secondary schools, including the transport and logistics sector, distance learning in the form in which it was initially established in Croatia belonged to the category of "emergency" teaching and not effective online teaching which is the result of the continuous development of e-learning. It was also noticed that distance learning is not equally applicable and effective at all levels of the educational vertical and that for primary and secondary schools as a much better solution proved to be real-time teaching, according to the standard schedule of hours with the possibility of interaction. However, large differences in the quality of teaching from institution to institution were identified, and the *online* alternative to practical teaching was particularly problematic. In general, interactivity between students was reduced, communication between teacher and student was often one-way and the technical complexity of conducting online teaching was high. There was also the problem of testing knowledge at a distance as well as problems with increased anxiety and depression among some students, decreased motivation of students, teachers and

[81] See more about the competitions at https://www.asoo.hr/obrazovanje/strukovno-obrazovanje/natjecanja-ucenika-strukovnih-skola/ i www.worldskillscroatia.hr (accessed on 1.6.21)

[82] Razvojni tim ASOO : Hrvatski okvir za osiguranje kvalitete u strukovnom obrazovanju i osposobljavanju / Priručnik za samovrjednovanje, RD DIGITAL d.o.o., Zagreb, 2011. p. 13. available at https://www.asoo.hr/UserDocsImages/Priru%C4%8Dnik%20za%20samovrjednovanje.pdf (accessed on 1.6.21)

[83] See more at https://www.asoo.hr/osiguravanje-kvalitete/strukovno-obrazovanje/e-kvaliteta/(accessed on 1.6.21)

[84] https://www.asoo.hr/projekti-i-suradnja/esf-projekti/modernizacija-sustava-strucnog-usavrsavanja-nastavnika-strukovnih-predmeta/

[85] On the new concept of in-service teacher training see more at https://www.asoo.hr/UserDocsImages/Projekt%20usavr%C5%A1avanja/Koncept_novoga_modela.pdf (accessed on 1.6.21 and https://edu.asoo.hr/(accessed on 1.6.21)

[86] https://www.haz.hr/izvodenje-nastave-na-daljinu/(accessed on 1.6.21)

professors. The above actually only practically confirms the advantages and disadvantages of e-education that became relevant ten years ago, especially with the significant penetration of e-technologies in education.[87] Therefore, it can be concluded that although new technologies, especially information technology, offer great opportunities in education, the practice shows that direct contact with educational professionals is indispensable in relation to contact through electronic technology and this should be taken into account in planning the educational future, especially in the specific and demanding transport and logistics sector.[88]

CONCLUSION

This paper discusses the general concepts and functions of management and the specifics of secondary vocational school management with an emphasis on the transport and logistics sector. Knowledge of management in general and management in secondary vocational schools was formed by noticing their components and interrelationships. Based on the existing knowledge about the general properties of the phenomenon, which implies knowledge of general attitudes and principles of management with emphasis on school management, the paper distinguished general from individual and special, and found that there is no significant deviation of characteristic components of modern management in general and management in secondary schools. At the same time, the paper represents a theoretical-cognitive reflection of originality, due to the establishment of connections with a specific area of management in vocational secondary schools, especially those that educate students in the transport and logistics sector.

LITERATURE

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mag. Roman Krajnc

Procesni elementi za kakovost javnega mestnega potniškega prometa

Mobilnost se lahko uresničuje na različne načine. V preteklosti se je z razvojem motorizacije vveliki meri razmahnil osebni motorni promet. To pa ima za posledico vse večjo gostoto prometnih tokov, zaradi uporabe fosilnih goriv veliko onesnaževanje okolja idr. Tako smo danes priča iskanju rešitve nastale situacije.

Eden od temeljnih ukrepov reševanja nastale situacije je postavitev sistema Trajnostne mobilnosti. Trajnostna mobilnost predstavlja uporabo tehnologije mobilnosti na naravi prijazen način, ekonomsko vzdržnost delovanja mobilnosti, ohranjanje okolja, zdravja ljudi idr.To pomeni, da če smo v preteklosti brez kakršnih koli osebnih in družbeno moralnih omejitevmasovno potovali z uporabo konvencionalnih vozil, se vozili posamično, nismo uporabljali koles kot možnost mobilnosti, je danes stanje povsem drugačno. Vse bolj se zavedamo, da dosedanje navade niso več sprejemljive. Da pa lahko uresničujemo načela trajnostne mobilnosti pa so za to potrebni določeni tehnično-tehnološki ukrepi znotraj prometnega sistema. Za načrtovanje in uvajanje so zadolžene posamezne inštitucije, tako na lokalnem kakor državnem nivoju.

Prispevek obravnava izbrane tehnično-tehnološke ukrepe, ki bi doprinesli k uresničevanju načel trajnostne mobilnosti. V prispevku se omejujemo na sistem javnega mestnega prometa.Obravnavali bomo procese in metode za uresničevanje načel trajnostne mobilnosti. Obravnavali bomo primere iz našega okolja.

Ključne besede: trajnostna mobilnost, kolesarski promet, linije.

Potniški promet

Osnovna naloga javnega potniškega prometa (JPP) je zadovoljevanje potreb ljudi po mobilnosti. Potniki izbirajo vrsto in način prevoza glede na dane možnosti, zmožnosti ter potrebe. Tako postavljeno stališče moramo za obravnavanje delovanja JPP opredeliti kot vhodne pogoje za izvajanje prevoza. Z razvojem tehnike in tehnologije prevoza oziroma z razvojem vseh aspektov prometnega sistema, imajo potniki vse večje možnosti udejstvovanja v prevoznem procesu kot tudi večjo izbiro podsistemov za potovanja. Poznamo več vrst potniškega prometa: peščev, z uporabo različnih prevoznih sredstev, individualni, skupinski, javni idr. Veliko pozornost pa velja nameniti mestnemu prometu, kjer je velika koncentracija

ljudi in koncentracija raznih ustanov in inštitucij.

Da bi javni linijski potniški promet (JLPP) kot sistem uresničeval postavljene cilje učinkovitosti in atraktivnosti, se morajo upoštevati družbene zahteve, kot so: razvoj življenjskega standarda, razvoj kakovost življenja ter koristi in potrebe po takšnem prometu. Kakovost prevozne storitve je eden temeljnih dejavnikov proizvodnje prevozne storitve.

Da obseg potniškega prometa že presega okoljske kriterije za varovanje le-tega, smo se kot družba pričeli zavedati morda šele v zadnjem desetletju. Posamezniki in določene politične skupine pa so ta problem zaznali že mnogo prej. Med njimi je tudi Lester R. Brown, ki v knjigi Načrt B, Mobilizacija za rešitev civilizacije (1) opozori na problematiko materialnega izkoriščanja planeta Zemlje in uničevanje le-tega.

Trajnostna mobilnost

Trajnostna mobilnost predstavlja uporabo tehnologije mobilnosti na naravi prijazen način, ekonomsko vzdržnost delovanja mobilnosti, ohranjanje okolja, zdravja ljudi idr. Trajnostna mobilnost vključuje (2) hojo, kolesarjenje, uporabo javnega potniškega prometa in alternativne oblike mobilnosti. Njen cilj je zagotavljanje učinkovite in enakopravne dostopnosti za vse, pri čemer je poudarek na omejevanju osebnega motornega prometa in porabe energije ter na spodbujanju trajnostnih potovalnih načinov.
Na področju trajnostne mobilnosti se izvajajo tako imenovani mehki ukrepi (2). Sem prištevamo kampanje za osveščanje in promocijo trajnostne mobilnosti, mobilnostne načrte za institucije, izobraževanje o trajnostni mobilnosti za vrtce in osnovne šole, v prihodnosti pa tudi izvajanje zelene mestne logistike ter uvajanje trajnostne parkirne politike, omejevanje prometa v mestnih jedrih ter uporabo sodobnih tehnologij za upravljanje mobilnosti. To lahkorazumemo kot proces uvajanja izobraževanja udeležencev v prometu, predvsem mlajše generacije, da je potrebno uvajati način mobilnosti, ki bo prijazen do okolja. V drugi stopnji ukrepov strokovne službe navajajo, da je potrebno uvajati nove, sodobne tehnike in tehnologije v prometu.

Ugotovitev, da je potrebno konvencionalni prometni sistem dopolniti z novimi spoznanji tehnike in tehnologije je samo po sebi razumljivo. Postavlja pa se vprašanje, zakaj šele v drugi stopnji mehkih ukrepov? V prispevku Zaviralni dejavniki razvoja trajnostne mobilnosti (3) smo prepoznavali zaviralne dejavnike pri uvajanju načel trajnostne mobilnosti. Prepoznavanje in razrešitev teh dejavnikov bi na enostaven in predvsem v časovno krajšem času načrtovanja in izvedbe projektov prišli do tehnično-tehnoloških rešitev za uresničevanje načel trajnostne
mobilnosti. Ti ukrepi so: optimalno trasiranje linij JPP, zagotovitev kolesarskih prehodov na vseh križiščih v mestu, zadostna gostota geografskih lokacij mestnih postajališč, uvajanje pametne signalizacije v križiščih ali njihov izklop ob zmanjšanju gostote prometa idr.
V prispevku natančneje analiziramo posodobitev sistema JLPP v mestih. Sledimo pojmovanju trajnostne mobilnosti z načelom pojmovanja mobilistike[1]. To pomeni, da upoštevamo logistične procese prometnega sistema, ki bi na enostaven, kakovosten in predvsem optimalen način uvajali ukrepe za uresničevanje načel trajnostne mobilnosti.

KAKOVOST V FUNKCIJI ODVIJANJA JLPP

V središču potniškega prometa se nahaja potnik kot najpopolnejše živo bitje, človek z vsemi svojimi osebnostnimi vrlinami in lastnostmi. Potnik kot predmet prevoza je najbolj občutljivi del prevoza. Je

zahteven, vedno pričakuje in zahteva udobje, varnost, rednost, hitrost, kakor tudi ekonomičnost udejstvovanja v procesu. Da bi lahko prevozniki zadovoljili visoke zahteve svojih potnikov, morajo vedno znova oblikovati ustrezen nivo svojih storitev, oziroma svojih ponudb, kot na primer kadrovsko izpopolnjevanje, moderniziranje prevoznih sredstev, modificiranje organizacije dela, upravljanje, posodabljanje informacijskih sistemov idr. Vsaka organizacija prometnega procesa deluje na posameznih načelih kakovosti storitev kot vsi druginosilci gospodarskih dejavnosti. V okviru tega so poznana načela SERVICE po Radačiću, ki predstavlja (4): S (Saferty) varnost; E (Efficiency) učinkovitost; R (Regularity) rednost; V (Velocity) hitrost; I (Interval) pogostnost; C (Conscientiousness) zavestnost in E (Economy) ekonomičnost.

Po Ogorelcu je kakovost transportne storitve opredeljena z elementi (5): hitrost, varnost, množičnost, rednost, točnost, pogostnost, dostopnost, udobnost. Sedaj je torej čas, da privzamemo tista navedena načela kakovosti JPP, ki lahko kar najkvalitetnejše posodobijo potniški promet posameznega okolja.

Trasiranje linj JPP v mestu

Za množičnost potnikov v javnem sistemu prevoza je pomemben element uvedba voznega reda. Če množičnosti (povpraševanja) na določeni relaciji oziroma liniji ni, potem je le-ta nerentabilna in običajno ni poslovno zanimiva za prevoznika. Torej gre za posreden, vendar zelo odločilen element odločitve. Če je na primer linija uvedena najkasneje ob dograditvi novega naselja ali ko je bila odprta nova cesta, obstaja več možnosti, da ljudje pričnejo uporabljati JLPP in niso prepuščeni iskanju alternativnega prevoza (običajno je to osebni prevoz). Zagotovi se možnost uporabe JLPP in s tem rentabilnost linije.

Po ZPCP (6) je linija definirana kot: »Linija je določena relacija in smer vožnje od začetne do končne avtobusne postaje ali avtobusnega postajališča, na kateri se prevažajo potniki v linijskem cestnem prometu po voznem redu in ceni, ki sta vnaprej določena in objavljena«. Zakon ne navaja, kje naj poteka linija oziroma kašni naj bodo parametri geografskih lokacij. Jepa v Uredbi (7) o načinu izvajanja gospodarske javne službe javnega linijskega prevoza

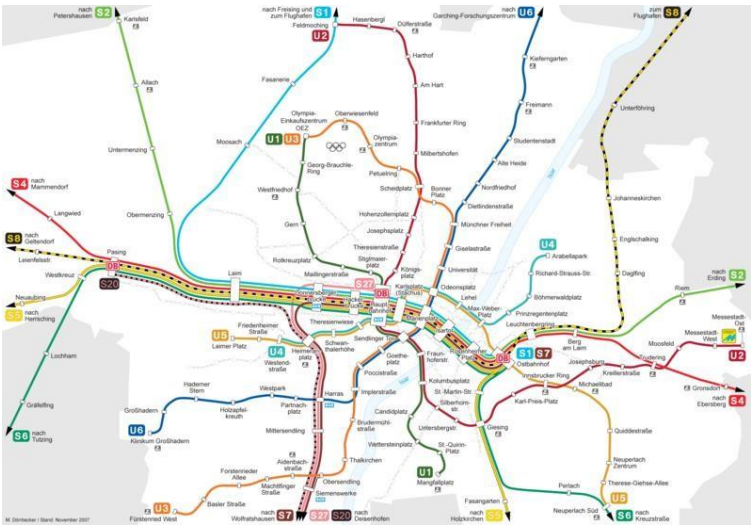
[1] Mobilistika - je veda o potovalnih navadah prebivalstva nekega prostora ter o vzrokih in posledicah teh navad, ki se kažejo v spremenjenih prostorsko-transportnih interakcijah. Mobilistika nam daje nove metode za študij
koordinacij med prostorskim planiranjem in prometnimi povezavami ter za odločanje o investicijah in logistični podpori na tem področju. (Vir: Bogataj, M. Mobilistika in prostor. Univerza v Ljubljani. 2000)

potnikov v notranjem cestnem prometu, o koncesiji te javne službe in o ureditvi sistema enotne vozovnice s členoma 7 in 8 postavljen t. i. standard dostopnosti. Ta navaja le število dnevnih povezav glede na razred naselja oziroma turistične destinacije in dan v tednu. Menimo, da je eden pomembnejših kazalcev gostote razdalja med geografskimi lokacijami (razdalja med postajališčema). Po Uredbi (8) o prostorskem redu Republike Slovenije je v 49. členu navedeno: »Javni potniški promet, ki ga sestavljajo medsebojno povezana omrežja cestnega, železniškega, vodnega in drugega prometa, je treba v poselitvenih območjih načrtovati tako, da omogočajo petminutno peš dostopnost iz območij stanovanj, mešanih območij, posebnih območij ter območij družbene infrastrukture do postajališč javnega potniškega prometa«.

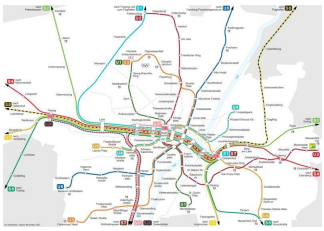
Poglejmo poenostavljeni prikaz razmerja razdalj med geografskimi točkami linije glede na velikost mesta. Večje ko je mesto, daljša je razdalja med postajališči (slika 1). Ko mesto pomanjšamo, se s tem sorazmerno z dolžino linije skrajšajo tudi razdalje med postajališči (slika 2). Torej v manjših mestih je potrebno

zagotovti ustrezno sorazmerje razdalj med postajališči glede na dolžino linije. Ob tem pa je potrebno upoštevati slabost, da se pri krajših razdaljah med postajališči zniža prometna hitrost vozil.

Slika št. 1: Večnivojska mreža linij mesta München



Slika št. 2: Večnivojska mreža linij mesta München



Vir: Slika 1, 2 http://de.wikipedia.org/wiki/S-Bahn_M%C3%BCnchen, 2008.

Analiza časa in razdalje hoje od lokacije bivanja do postajališča oz. od ciljnega postajališča do končne točke potovanja daje dovolj kakovosten vhodni podatek za določanje medpostajališčnih razdalj. Vendar je tu potrebno biti kooperativen, da se dolžinska omejitev definira od primera do primera.

Primer 1: Naselje Lava, Celje**.** Sedanja trase linije (rdeča debela črta) poteka po obvozni cesti naselja Lava (slika 3). To pomeni, da poteka tangentno glede na naselje. Na primer, če gre potnik iz OŠ Lava na postajališče 2, potrebuje za pot 10 min. Če pa gre na postajališče 3 pa potrebuje 8 minut (rdeči puščici). Torej je ta trasa linije v nasprotju z določili Uredbe (8). V primeru trase linije diametralnega tipa skozi naselje (modra črta), ki bi vodila skozi naselje

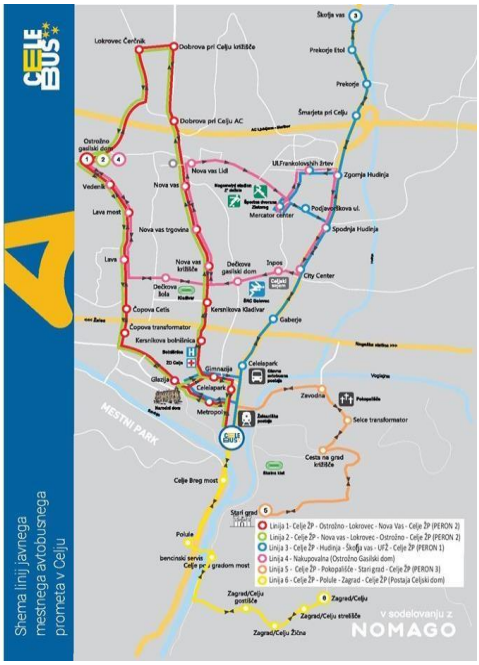
Lava, bi bil porabljen čas hoje do novih lokacij postajališč (modre pike) v povprečju za polovicokrajši. To pomeni, da bi bila diametralna linija ugodnejša za potnike. Projekcija spremembe trase linije temelji na izkustvenem opazovanju sedanjih prometnih tokov.

Idealna trasa linije bi bila po modri črti. Moramopa pogledati v preteklost. V preteklosti je odsek linije potekal po odseku ceste označeno s črno črto in v nadaljevanju po tej ulici (Ostrožno). Z izgradnjo obvozne ceste (rdeča črta) se je linija prestavila na ta odsek. Pred nekaj leti se je čez potok zgradil novi most, vendar samo za pešce in kolesarje (zvezdica). S tem se je onemogočil motorni promet in s tem tudi možnost ponovnega trasiranja linije JPP. V letu 2019 se jepričela izgradnja novega odseka (črna prekinjenačrta) s priključkom krožnega križišča (beli kolobar). Tako bi bila priložnost, da bi se dogradilodsek (rumena črta) in s tem možnost novega trasiranja linije po modri črti

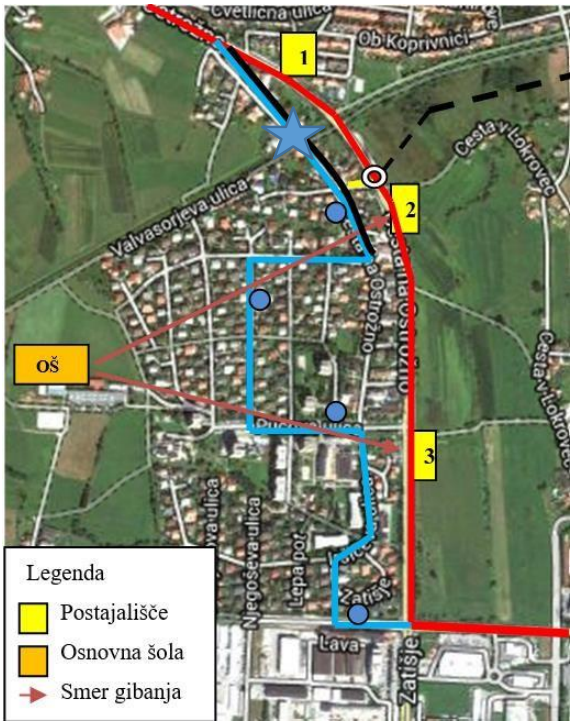
Torej kot smo že navedli, bi bila diametralna linija, ki bi potekala skozi naselje, ugodnejša za tloris naselja. S tem bi imeli stanujoči z obeh strani linije enake razdalje. Takšen ukrep bi bil v skladu z metodo mehkih ukrepov. Seveda, če bi cestni elementi to dopuščali.

Vir: podloga google

Slika št. 3: Projekcija linije na Lavi, Celje



Slika št. 4: Mreža linij CeleBUS



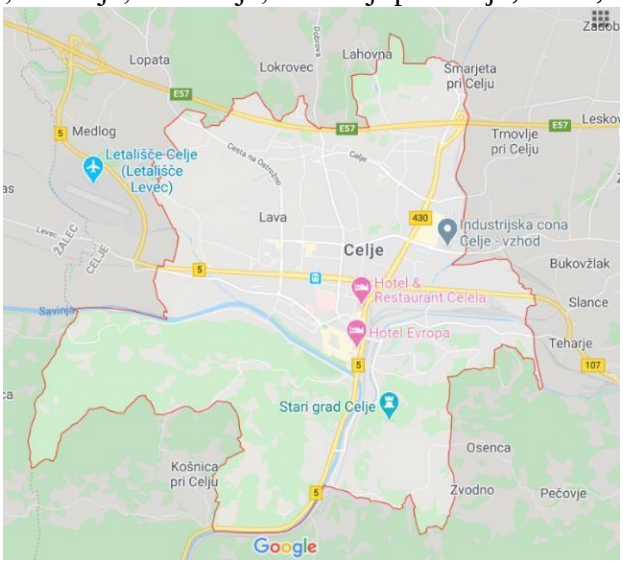
Primer 2: Mreža linij CeleBUS. Januarja 2019 je po celjskih ulicah zapeljal CeleBUS. Mestni promet vozi z 10novimi avtobusi na stisnjen zemeljski plin po mreži linij s šestimi linijami (slika št. 4). Delovanje mestnega prometa je v sklopu usmerjenosti k ustvarjanju energetsko učinkovite družbe, varstvu okolja in trajnostnih rešitev prometa. Ob tem pa je potrebno povedati, da po območju Celja že desetletja poteka t. i. mestni promet. Zakaj ta dva sistema nista kompatibilnane bomo raziskovali.

Mesto Celje ima 10 mestnih četrti in mestna občina9 krajevnih skupnosti. Mestno območje zajema22,71 km². Površina mestne občine Celje pa znaša 94,9km². Naselja v občini Celje so: Brezova, Bukovžlak, Celje,Dobrova, Glinsko, Gorica pri Šmartnem, Jezerce priŠmartnem, Košnica pri Celju, Lahovna, Leskovec, Lipovec pri Škofji Vasi, Ljubečna, Loče, Lokrovec, Vir: https://www.celje.info/aktualno/ Lopata, Medlog, Osenca, Otemna, Pečovnik, Pepelno, Prekorje, Rožni Vrh, Runtole, Rupe, Slance, Slatina v Rožni dolini, Šentjungert, Škofja vas, Šmarjeta pri Celju, Šmartno v Rožni dolini, Šmiklavž pri Škofji vasi, Teharje, Tremerje, Trnovljepri Celju, Vrhe, Začret, Zadobrova, Zvodno, Žepina (slika št. 5).

Slika št. 5: Mestna naselja Mestne občine Celje

Mestna občina Celje ima skupno 336,020 km cest (9). Skupna dolžina cest mestnega območja pa znaša 182,33 km. Navajamo, da je dolžina cest v mestnem delu Celja približek. Vključili smo naselja kjer deluje sedanja mreža linij (slika št. 4) in dodali še naselja Bukovžlak, Teharje, Slance, Košnico/Celju, Ljubečno, kar štejemo za potencial mestnega linijskega prometa, sedanja mreža linij pa jih ne pokriva.

Iz navedenih podatkov izračunamo gostoto mreže in linijski koeficient. Izhajalibomo iz podatkov: površina mesta (mestno območje in območje občine), skupna dolžina mestnih in občinskih cest in skupna dolžina linij (tabela št. 1).



Vir: www.google Tabela

št.1: Linije CeleBUS, marec 2020

Linija	Relacija	Značilnost	Dolžni v km
Linija 1 – Ostrožno – Lokrovec -Nova vas	Železniška postaja - Ostrožno – Lokrovec – Nova vas - Železniška ostaja	Krožna	8
Linija 2 - Nova vas-Lokrovec-Ostrožno	Železniška postaja – Nova vas – Lokrovec - Ostrožno – železniška postaja	Krožna	9
Linija 3 - Hudinja-Škofja vas	Železniška postaja – Gaberje - Šmarjeta pri Celju - Škofja vas – Gaberje – Železniška postaja	Radialna	Ena smer 7,5 Povratna15
Linija 4 - Nakupovalna	Ostrožno – Lava – Nova vas - Zg. Hudinja Ul. frank. žrtev – Dečkova c. GD – Nova vas – dečkova c Š – Lava - Ostrožno	Krožno - radialna	12
Linija 5 – Pokopališče -Stari grad	Železniška postaja – Cesta na grad – Staro Grad – Železniška postaja	Radialna	Ena smer 4 Povratna 8
Linija 6 – Polule - Zagrad	Železniška postaja - Polule BS - Zagrad/Celju Žična - Zagrad/Celju trg. - Zagrad/Celju Žična - Polule BS	Radialna	Ena smer 4 Povratna 8

Vir: Vozni red, 20120Gostota

mreže:

a) Mestna občina Celje $\sigma = \frac{\sum L}{P} = \frac{44,5}{94,9} = 0,46$ (km/km^2)

b) Mesto Celje $\sigma = \frac{\sum L}{P} = \frac{44,5}{22,71} = 1,96$ (km/km^2)

Kjer je:
 – gostota mreže,
 L – dolžina vseh linij mesta (km),
P – površina mesta (km^2).

Vrednost kaže na kvaliteto oskrbljenosti določenega mesta s ponudbo prometne storitve.Po Lehner (10) gostota mreže JPP ustrezna, če σ znaša:

- V širšem delu mesta (občina) 1,5 – 2,5 km/km^2.
- V središču mesta (mestno območje) 3 - 5 km/km^2

V obeh izračunih vidimo, da sta rezultata precej nizka.Linijski

koeficient:
Prikazuje vrednost koeficienta koliko linij v povprečju oskrbuje vsak km ulične mreže. Izhajamoiz dveh podatkov dolžine cest (Občine Celje in mesto Celje).

a) Mestna občina Celje b) Mesto Celje

$K_1 = \frac{\sum L}{\sum Lu}$

$$= \frac{44{,}5}{336{,}020}$$

$= 0{,}13 \qquad K_1$

$$= \frac{\sum L}{\sum Lu}$$

$$= \frac{44{,}5}{182{,}33}$$

$= 0{,}24$

Kjer je:
Kl – linijski koeficient,
 Lu – skupna dolžina mestne ulične mreže.

Po Stramantonu (10) je ugodna vrednost linijskega koeficienta v mestih med 1,1 in 1,3. Torej sta dobljeni vrednosti nizki.

Slika št. 4 prikazuje celjsko mrežo linij JPP. Linije so radialnega, krožnega tipa in kombinacija obeh. Za kakovostno povezavo naselij je pomemben pravilni izbor tipa linije. Izhodiščno razmišljanje smo že podali v primeru 1. Pri obravnavanju celotne mreže je potrebno izhajati izvelikosti mesta, strukture mesta in naselij, koncentracije potencialnih potnikov, lokacije inštitucij (šole, bolnišnica, mestni urad…), center mesta, lokacije potniških terminalov idr. Določiti je potrebno ustrezni tip linije glede na naselje in prej navedene kriterije.

Model določitve ustreznega tipa linije.

1. korak

Teoretična postavitev radialnih linij, ob predpostavki, da izhajamo iz centra mesta – lokaciježelezniškega potniškega terminala.

2. korak

Ob analizi koncentracije potencialnih potnikov, lokacij spalnih naselij, lokacij raznih inštitucij in ostalo že predhodno navedeno ter upoštevajoč shemo mestnih ulic je potrebno »preoblikovati« trase iz 1. koraka. Prilagoditev smo prikazali na liniji 1 (slika št. 6). Je pa potrebno sprejeti odločitev ali se linija zaključi v naselju Ostrožno ali se nadaljuje proti naseljuLopata brez vmesnega kraka idr. Torej glede na vse navedene kriterije je potrebno določiti traso linij, ki se najbolje približa potnikom.

Slika št. 6: Projekcija trasiranja linij JPP

Vir: Podlaga zemljevid google

3. korak

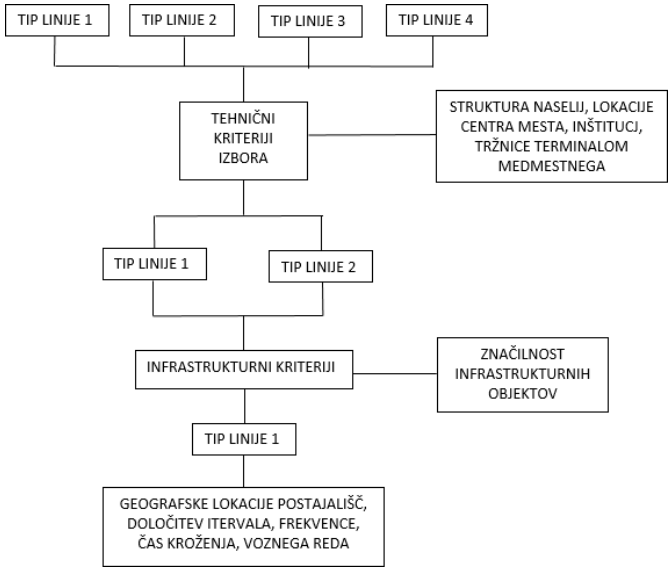
Je določitev idealnejšega tipa linije v primerjavi z ostalimi tipi linij (diametralna, tangentna,krožna). Mnenja smo, da ima radialni tip linije veliko prednosti.

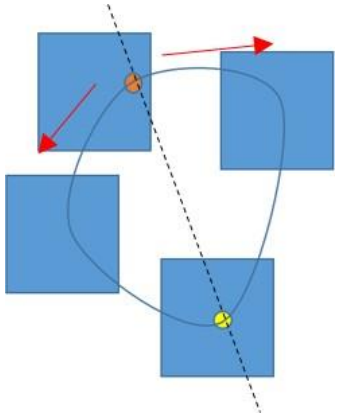
4. korak

Določitev intervala, frekvence, to je voznega reda ter ostalih tehnično tehnoloških kriterijev zavzpostavitev delovanja linij (omejili smo se le na tehnološke značilnosti linij). Koraki so prikazani še v algoritmu (slika št. 7). Sedanja mreža ima tudi krožni tip linije. S sliko št. 8 ponazorimo značilnost krožne linije. Glede na smer linije se mora potnik, ki potuje iz točke – rjava pika v točko – rumena pika peljati v odklon (rdeči puščici) glede na diametralno povezavo(črtkana črta) med pikama naselij. To podaljša razdaljo in čas potovanja. Torej idealnejši je radialni tip linije, vendar pa je glede na interval voženj in št. linij potrebno zagotoviti ustreznošt. vozil. V primeru krožne linije je dovolj eno oz. dve vozili. Kot smo že omenili, je kvalitetno umeščanje tras linij v sedanjo cestno mrežo našega primera nemogoče. V našem primeru na določenih točkah cestni elementi ne dopuščajo vožnje avtobusov ali drugih prevoznih sredstevJPP (ozki odseki, peščeve cone, premostitveni objekti, radiji zavojev idr.). Iz tega lahko sklepamo, da v bodoče verjetno ne moremo pričakovati večjih sprememb stanja tras linij.

Slika št. 7: Algoritem določitve tipa linije

Slika št. 8: Ponazoritev krožne linije





Dinamični elementi linije

Dinamični elementi potniškega prevoza so temeljni kriteriji vrednotenja kakovosti delovanja javnega linijskega prevoza. Vsa spoznanja o eksploatacijskih pogojih javnega prevoza morajo slediti ciljem kakovosti s tehniško – tehnološkega vidika. Med drugim se za kazalce kakovosti uporabljajo naslednji elementi: Pogostnost prevoza, interval med vozili, potrebno število vozilna liniji in hitrost potovanja. V nadaljevanju prispevka bomo obravnavali le interval, ki je za potnike eden od pomebnejših elementov.

Interval je časovni razmik med vozili na liniji. Manjši kot je časovni razmik med vozili, pogostejesi sledijo vozila in se s tem usklajuje povpraševanje s ponudbo prevoza na posamezni liniji. Poenostavljeno povedano to pomeni pogostnost vozil na liniji (frekvenca vozil v časovni enoti)in bolj kot si vozila na liniji sledijo, večja je verjetnost, da bo potniku termin vožnje ustrezal. Interval izrazimo s časovno razdaljo med dvema voziloma na liniji. V tabeli št. 2 prikazujemo podatke linij za CeleBUS.

V juniju 2019 je sistem CeleBUS na petih linijah prepeljal 15.152 potnikov. Največ potnikov jeprepeljal na liniji Celje ŽP-Hudinja-Celje ŽP, in sicer 5.564. Sledijo liniji Celje ŽP–Nova vas Lidl–Celje ŽP s 4.761 potniki in linija Celje ŽP – Ostrožno GD - Celje ŽP s 3.441 potniki in ostalo 1386(11). V tem času še ni delovala linija 6. Tako je znašala kapaciteta vozil 96800 potniških mest. Prav tako so bile vrednosti *i* drugačne: linija1, 2, 3 - 20 min, linija 4 – 40 min in linija 5 - 60 min.In mreža linij je bila manj razvejana. Če primerjamo št. prepeljanih potnikov in št. prebivalcevlahko zapišemo stopnjo rasti potnikov, ki znaša:

$$r = \frac{15152}{37875}$$

= 0.4

Za prvo obdobje leta 2020 podatkov nismo analizirali, saj se je v času epidemije v SLO prekinilodelovanje JLPP. Bi pa bilo smiselno mesečno spremljanje obsega prevoza potnikov. Spremljalabi se stopnja rasti in neenakomernost prevoza potnikov. Dobljeni vrednosti bi bile kazaleckvalitete prevoza in v primeru upada vrednosti bi se izvajali ukrepi za izboljšanje stanja.

Tabela št. 2: Dinamični elementi linije, 2020

Linija	Kapaciteta vozila (sedeži in stojišča)	Število voženj dnevno – delovni dnevi	Sedanji interval vozil (i) vmin.	Tehnična kapaciteta vozila (potniki/dan)	Tehnična kapaciteta vozila (potniki/ teden-delovni dnevi)	Tehnična kapaciteta vozilapotniki/ mesec- 22 dni
Linija 1	40	27	30	1080	5400	23760
Linija 2		28	30	1120	5600	24640
Linija 3		28	30	1120	5600	24640
Linija 4		18	40	720	3600	15840
Linija 5		9	60	360	1800	7920
Linija 6		12	60	480	2400	10560
Skupaj		122		4 880	24 400	107 360

Zaključek

Za uresničevanje načel trajnostne mobilnosti je JPP eden od pomembnih dejavnikov. Po svetuso določena mesta že pričela z omejevanjem osebnega motornega prometa po določenih mestnih ulicah – mestna jedra. Torej so te ulice namenjene nemotornemu prometu. Pri tem pa je potrebno imeti v mislih, da je pešec omejen z dolžino peščeve hoje. Tako je potrebno na pravilen in prijazen način umeščati sistem mestnega linijskega prometa v mestna jedra. Elegantno je to urejeno s podzemnim podsistemom prometa, vendar to v vsakem mestu ne moremo realizirati. Tako je potrebno iskati idealni menedžment javnega linijskega potniškegaprometa na vseh segmentih tehnik in tehnologij.

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mag. Roman Krajnc

Process elements for the quality of public urban passenger transport

Mobility can be realized in different ways. In the past, the development of motorization has greatly boosted personal motor traffic. This results in an increasing density of traffic flows, due to the use of fossil fuels, high environmental pollution, etc. Thus, today we are witnessing the search for a solution to the situation.

One of the basic measures to address the situation is to set up a Sustainable Mobility system. Sustainable mobility represents the use of mobility technology in a nature-friendly way, the economic sustainability of mobility, the preservation of the environment, human health, etc. This means that if in the past we travelled without using any conventional and social-moral constraints using conventional vehicles, rode individually, did not use bicycles as a mobility option, today the situation is completely different. We are increasingly aware that current habits are no longer acceptable. However, in order to implement the principles of sustainable mobility, certain technical and technological measures within the transport system are needed. Individual institutions, both at the local and national level, are in charge of planning and implementation.

The article discusses selected technical and technological measures that would contribute to the implementation of the principles of sustainable mobility. In this article, we limit ourselves to the system of public urban transport. We will discuss the processes and methods for implementing the principles of sustainable mobility. We will discuss cases from our environment.

Key words: sustainable mobility, cycling, lines.

1 Passenger traffic

The basic task of public passenger transport (PPT) is to meet people's mobility needs. Passengers choose the type and mode of transport according to the given possibilities, capabilities and needs. In order to address the operation of public transport, the position thus set up must be defined as input conditions for the implementation of transport. With the development of transport technology and with the development of all aspects of the transport system, passengers have increasing opportunities to participate in the transport process as well as a greater choice of subsystems for travel. We know several types of passenger transport: pedestrians using different means of transport, individual, group, public, etc. Much attention should be paid to urban

transport, where there is a high concentration of people and a concentration of various institutions.

In order for public liner passenger transport (JLPP) as a system to achieve the goals of efficiency and attractiveness, social requirements such as: development of living standards, development of quality of life and the benefits and needs of such transport must be taken into account. The quality of the transport service is one of the fundamental factors in the production of the transport service.

As a society we began to realize only in the last decade that the volume of passenger traffic already exceeds the environmental criteria for its protection. However, individuals and certain political groups have perceived this problem much earlier. Among them is Lester R. Brown, who in his book Plan B, Mobilization for the Salvation of Civilization (1) draws attention to the problem of material exploitation of the planet Earth and its destruction.

2 Sustainable mobility

Sustainable mobility represents the use of mobility technology in a nature-friendly way, the economic sustainability of mobility, the preservation of the environment, human health, etc. Sustainable mobility includes (2) walking, cycling, the use of public passenger transport and alternative forms of mobility. It aims to ensure efficient and equal access for all, with an emphasis on limiting personal motor traffic and energy consumption, and promoting sustainable travel modes.

In the field of sustainable mobility, so-called soft measures are being implemented (2). These include campaigns to raise awareness and promote sustainable mobility, mobility plans for institutions, education on sustainable mobility for kindergartens and primary schools, and in the future the implementation of green urban logistics and the introduction of sustainable parking policy, limiting traffic in city centres and using modern management technologies for mobility. This can be understood as a process of introducing education for road users, especially the younger generation, that it is necessary to introduce a way of mobility that will be environmentally friendly. In the second stage of the measures, the experts state that it is necessary to introduce new, modern techniques and technologies in transport.

The finding that the conventional transport system needs to be supplemented with new techniques and technology is self-evident. But the question arises, why only in the second stage of measures? In the article Inhibitory factors of sustainable mobility development (3) we identified inhibitory factors in the introduction of the principles of sustainable mobility. Identifying and resolving these factors would lead to technical and technological solutions for the implementation of the principles of sustainable development in a simple and, above all, shorter project planning and implementation time.

These measures are: optimal tracing of public transport lines, provision of bicycle crossings at all intersections in the city, sufficient density of geographical locations of city stops, introduction of smart signage at intersections or their shutdown while reducing traffic density, etc. In this article, we analyse in more detail the update of the JLPP system in cities. We follow the concept of sustainable mobility[1] with the principle of the concept of mobility. This means that we take into account the logistical processes of the transport system, which would introduce measures for the

implementation of the principles of sustainable mobility in a simple, high-quality and, above all, optimal way.

3 The Jlpp Performance Quality

At the centre of passenger traffic is the passenger as the most perfect living being, a man with all his personal virtues and qualities. The passenger as the object of transport is the most sensitive part of transport. It is demanding, always expects and requires comfort, safety, regularity, speed, as well as the economy of participating in the process. In order for carriers to be able to meet the high demands of their passengers, they must always create the appropriate level of their services or offers, such as staff training, modernization of means of transport, modification of work organization, management, updating of information systems, etc. Each organization of the transport process operates on individual principles of service quality like all other economic operators. In this context, the principles of SERVICE are known according to Radačić, who represents (4): S (Safety) security; E (Efficiency) efficiency; R (Regularity) regularity; V (Velocity) velocity; I (Interval) frequency; C (Conscientiousness) awareness and E (Economy) economy.

According to Ogorelec, the quality of transport service is defined by elements (5): speed, safety, mass, regularity, accuracy, frequency, accessibility, comfort. Now is the time to adopt those stated principles of public transport quality, which can modernize the passenger transport of an individual environment in the best possible way.

3.1 Tracing of public transport lines in the city

An important element for the mass of passengers in the public transport system is the introduction of the timetable. If there is no crowd (demand) on a certain route or line, then it

[1] Mobilistika - je veda o potovalnih navadah prebivalstva nekega prostora ter o vzrokih in posledicah teh navad, ki se kažejo v spremenjenih prostorsko-transportnih interakcijah. Mobilistika nam daje nove metode za študij

koordinacij med prostorskim planiranjem in prometnimi povezavami ter za odločanje o investicijah in logistični podpori na tem področju. (Vir: Bogataj, M. Mobilistika in prostor. Univerza v Ljubljani. 2000)

is unprofitable and is usually not commercially interesting for the carrier. So it is an indirect but very decisive element of the decision. For example, if the line is introduced at the latest when a new settlement is completed or when a new road has been opened, there are more chances for people to start using JLPP and not be left to look for alternative transport (usually personal transport). The possibility of using JLPP and thus the profitability of the line is provided.

According to ZPCP (6), a line is defined as follows: "A line is a certain route and direction of travel from the initial to the final bus station or bus stop, where passengers are transported in regular road traffic according to the schedule and price, which are determined and announced in

advance.«. The law does not specify where the line should run or what the parameters of geographical locations should be. However, in the Regulation (7) on the manner of performing the public utility service of public regular passenger transport in domestic road transport, on the concession of this public service and on the regulation of the single ticket system with Articles 7 and 8, thus accessibility standard. This only states the number of daily connections according to the class of the settlement or tourist destination and the day of the week. We believe that one of the most important indicators of density is the distance between geographical locations (distance between stops). According to the Decree (8) on the Spatial Order of the Republic of Slovenia, Article 49 states: "Public passenger transport, consisting of interconnected road, rail, water and other transport networks, must be planned in settlement areas in such a way as to enable five minutes on foot from residential areas, mixed areas, special areas and areas of social infrastructure to public passenger transport stops".

Let's look at a simplified representation of the ratio of distances between geographic points of a line with respect to city size. The larger the city, the longer the distance between the stops (Figure 1). When the city is reduced, the distances between stops are shortened in proportion to the length of the line (Figure 2). So in smaller cities it is necessary to ensure an appropriate ratio of distances between stops according to the length of the line. At the same time, it is necessary to take into account the disadvantage that the traffic speed of vehicles is reduced at shorter distances between stops.

Picture 1: Multilevel network of lines of the city of Munich

Picture 2: Multilevel network of lines of the city of Munich

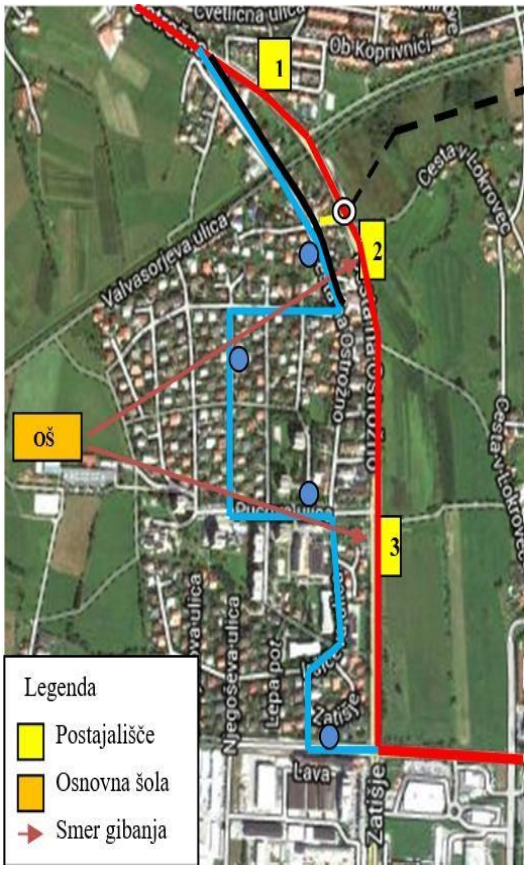
Source: Picture 1, 2 http://de.wikipedia.org/wiki/S-Bahn_M%C3%BCnchen, 2008.

Analysis of time and walking distance from the location of residence to the stop or from the destination station to the final point of the journey, it provides sufficient quality input to determine the inter-station distances. However, it is necessary to be cooperative here in order to define the length limit on a case-by-case basis.

Example 1: settlement Lava, Celje. The current route of the line (red thick line) runs along the bypass road of the Lava settlement (Picture 3). This means that it runs tangent to the settlement. For example, if a passenger from Lava Primary School goes to stop 2, it takes 10 minutes to

travel. However, if one goes to stop 3, it takes 8 minutes (red arrows). Therefore, this route of the line is contrary to the provisions of the Regulation (8). In the case of the route of a diametrical type line through the settlement (blue line) leading through the settlement of Lava, the time spent walking to the new locations of the stops (blue dots) would be spent on average half as long. This means that the diametrical line would be more favourable for passengers. The projection of the line route change is based on experiential observation of current traffic flows.

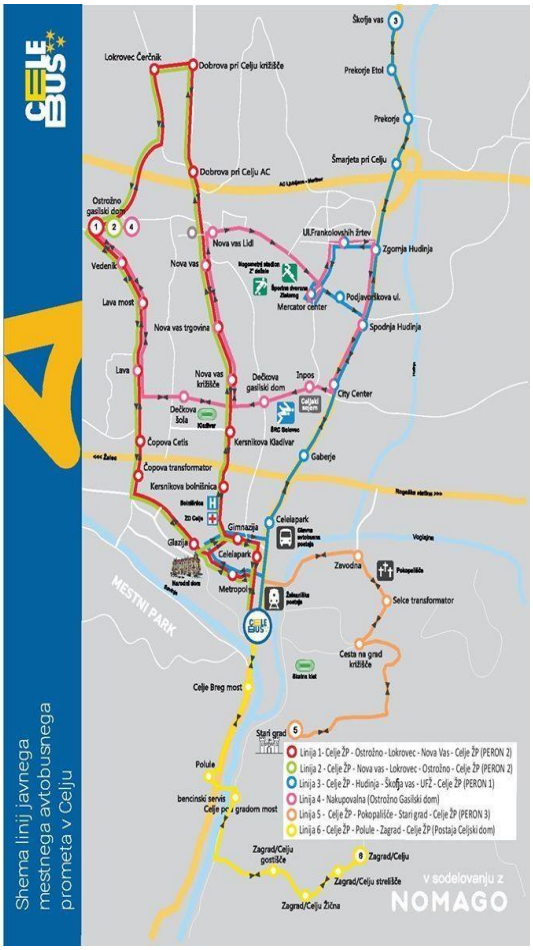
Picture 3: Line projection on Lava, Celje



Source: Google lining

The ideal route of the line would be along the blue line. But we need to look back into the past. In the past, a section of the line ran along a section of road marked with a black line and then along this street (Ostrožno). With the construction of the bypass road (red line), the line was moved to this section. A few years ago, a new bridge was built across the stream, but only for pedestrians and cyclists (star). This prevented motor traffic and thus the possibility of re-tracing the public transport line. In 2019, the construction of a new section (black dashed line) with the connection of a roundabout (white ring road) began. Thus, there would be an opportunity to upgrade the section (yellow line) and thus the possibility of re-tracing the line along the blue line. So as already mentioned, a diametrical line running through the settlement would be more favourable for the floor plan of the settlement. This would give residents on both sides of the line the same distance. Such a measure corresponds to the soft action method. Of course, if road elements allow it.

Picture 4: Lines network CeleBUS

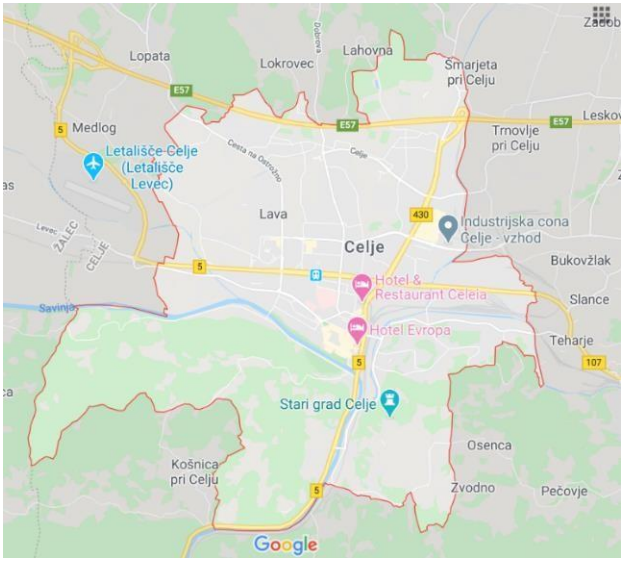


Example 2: CeleBUS line network. In January 2019, CeleBUS drove through the streets of Celje. City transport runs with 10 new compressed natural gas buses on a network of six-line lines (Picture 4). The operation of urban transport is a part of the focus on creating an energy-efficient society, environmental protection and sustainable transport solutions. At the same time, it is necessary to say that it has been going on in the Celje area for decades.

The city of Celje has 10 city districts and the municipality has 9 local communities. The urban area covers 22.71 km². The area of the municipality of Celje is 94.9 km². The settlements in the municipality of Celje are: Brezova, Bukovžlak, Celje, Dobrova, Glinsko, Gorica pri Šmartnem, Jezerce pri Šmartnem, Košnica pri Celju, Lahovna, Leskovec, Lipovec, Ljubečna, Loče, Lokrovec, Lopata, Medlog, Osenca, Otemna, Pečovnik, Pepelno , Prekorje, Rožni Vrh, Runtole, Rupe, Slance, Slatina v Rožni dolini, Šentjungert, Škofja vas, Šmarjeta pri Celju, Šmartno v Rožni dolini, Šmiklavž pri Škofji vasi, Teharje, Tremerje, Trnovlje pri Celju, Vrhe, Začret, Zadobrova, Zvodno, Žepina (Picture nb. 5).

Source: https://www.celje.info/aktualno/

Picture 5: City settlements of Celje Municipality



Source: www.google

The Municipality of Celje has a total of 336,020 km of roads (9). The total length of roads in the urban area is 182.33 km. We state that the length of roads in the city part of Celje is an approximation. We included settlements where the current network of lines operates (Picture 4) and added the settlements of Bukovžlak, Teharje, Slance, Košnica / Celje, Ljubečno, which are considered the potential of urban line traffic, but the current network of lines does not cover them.

From the above data, we calculate the network density and the line coefficient. We will start from the data: the area of the city (urban area and the area of the municipality), the total length of urban and municipal roads and the total length of lines (Chart 1).

Chart 1: CeleBUS lines, March 2020

Line	Destination	Characteristics	Km lenght
Line 1 – Ostrožno – Lokrovec -Nova vas	Železniška postaja - Ostrožno – Lokrovec – Nova vas - Železniška ostaja	circular	8
Line 2 - Nova vas- Lokrovec-Ostrožno	Železniška postaja – Nova vas – Lokrovec - Ostrožno – železniška postaja	circular	9
Line 3 - Hudinja-Škofja vas	Železniška postaja – Gaberje - Šmarjeta pri Celju - Škofja vas – Gaberje – Železniška postaja	radial	One way 7,5 Return15
Line 4 - Nakupovalna	Ostrožno – Lava – Nova vas - Zg. Hudinja Ul. frank. žrtev – Dečkova c. GD – Nova vas – dečkova c Š – Lava - Ostrožno	Circular - radial	12
Line 5 – Pokopališče -Stari grad	Železniška postaja – Cesta na grad – Staro Grad – Železniška postaja	Radial	One way 4 Return 8
Line 6 – Polule - Zagrad	Železniška postaja - Polule BS - Zagrad/Celju Žična - Zagrad/Celju trg. - Zagrad/Celju Žična - Polule BS - Železniška postaja	Radial	One way 4 Return 8
Sum - one way			44,5

Source: Vozni red, 2020

Grid density:

a) Celje Municipality $\sigma = \frac{\sum L}{P} = \frac{44,5}{94,9} = 0,46\ (\text{km/km}^2)$

b) City of Celje $\sigma = \frac{\sum L}{} = \frac{44,5}{}$

= 1,96 (km/km^2)

P 22,71

According to:

□ – grid density,

□ L – overall lenght of the city lines (km),

P – city area (km^2).

The value of □ indicates the quality of supply of a certain city with the offer of transport services. According to Lehner (10), the density of the PPT network is appropriate if σ is:
- In the wider part of the city (municipality) 1.5 - 2.5 km / km2.
- In the city center (urban area) 3 - 5 km / km2

In both calculations we see that the results are quite low.

Line coefficient:
It shows the value of the coefficient of how many lines on average each km of street network supplies. We start from two data on the length of roads (Municipality of Celje and the city of Celje).

a) Celje Municipality b) City of Celje

K_1

$= \frac{\sum L}{\sum L_u}$

$= \frac{44,5}{336,020}$

= 0,13 K_1

$= \frac{\sum L}{\sum L_u}$

$= \frac{44,5}{182,33}$

= 0,24

According to:
Kl – line coefficient,
□ L_u – the total length of the city street network.

According to Stramanton (10), the favourable value of the line coefficient in the cities is between

1.1 and 1.3. So the values obtained are low.

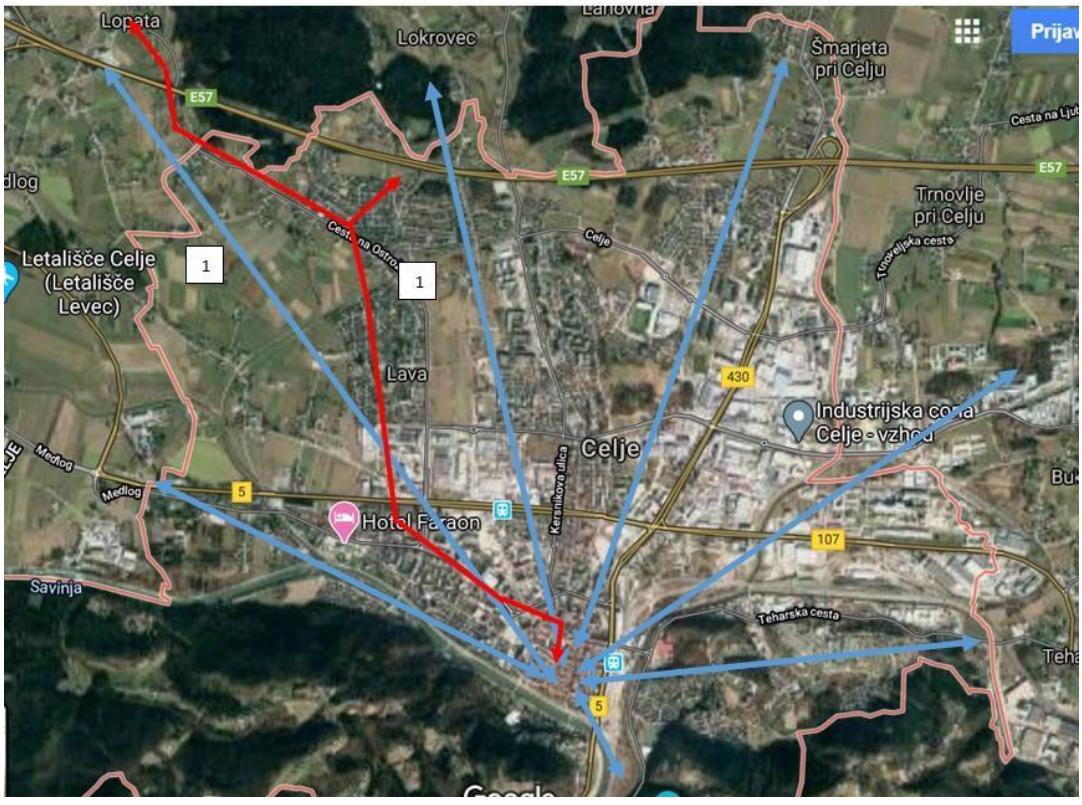
Picture no. 4 shows the Celje network of public transport lines. The lines are of radial, circular type and a combination of both. The correct choice of line type is important for well- connected settlements. The initial thinking has already been given in case 1. When considering the entire network, it is necessary to start from the size of the city, structure of the city and settlements, concentration of potential passengers, location of institutions (schools, hospital, city office…), city center, location of passenger terminals, etc. It is necessary to determine the appropriate type of line according to the settlement and the previously mentioned criteria.

Model for determining the appropriate line type.

Step 1
Theoretical layout of radial lines, assuming that we start from the city centre - the location of the railway passenger terminal.

Step 2
When analysing the concentration of potential passengers, locations of sleeping settlements, locations of various institutions and other previously mentioned, and taking into account the scheme of city streets, it is necessary to "transform" the routes from step 1. The adjustment was shown on line 1 (Picture 6). However, it is necessary to decide whether the line ends in the settlement of Ostrožno or continues towards the settlement of Lopata without an intermediate branch, etc. Therefore, according to all the above criteria, it is necessary to determine the route of the lines that are closest to the passengers.

Picture 6: Projection of tracing PPP lines

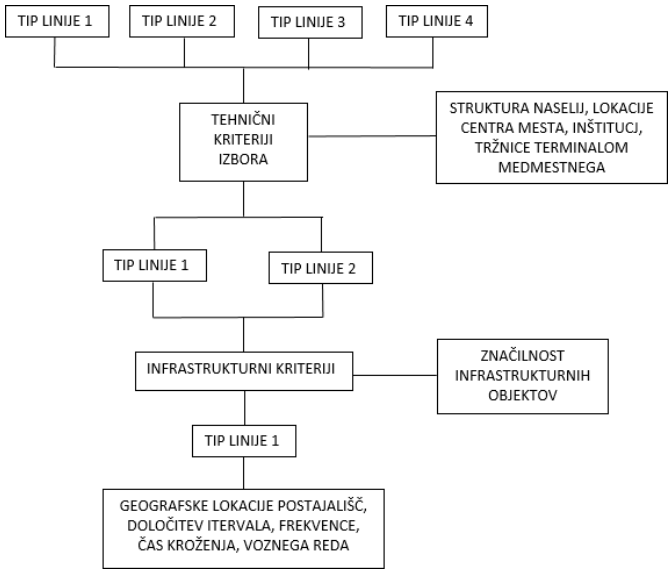


Source: Google maps

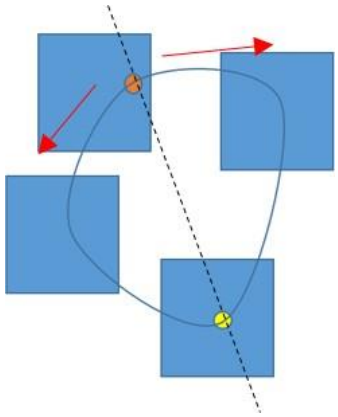
Step 3
It is the determination of a more ideal line type compared to other line types (diametrical, tangential, circular). We are of the opinion that the radial type of line has many advantages.

Step 4
Determining the interval, frequency, for example timetable and other technical and technological criteria for establishing the operation of lines (we limited ourselves to the technological characteristics of the lines). The steps are also shown in the algorithm (Picture 7). The current network also has a circular line type. Picture 8 illustrates the characteristic of a circular line. Depending on the direction of the line, the passenger traveling from point - brown dot to dot - yellow dot must be driven in a deviation (red arrow) with respect to the diametrical connection (dashed line) between the dots of settlements. This prolongs the distance and travel time. So the radial type of line is more ideal, but given the interval of runs and no. lines need to provide the appropriate no. vehicles. In the case of a circular line, one or two vehicles. As we have already mentioned, it is impossible to place high-quality routes in the current road network of our case. In our case, at certain points the road elements do not allow the driving of buses or other means of public transport (narrow sections, pedestrian zones, bridging structures, turning radii, etc.). From this we can conclude that in the future we can probably not expect major changes in the state of route lines.

Picture 7: Line type determination algorithm



Picture 8: Radial line diagram



3.2 Dynamic line elements

Dynamic elements of passenger transport are the basic criteria for evaluating the quality of public regular transport. All knowledge of the operating conditions of public transport must follow the quality objectives from a technical - technological point of view. Among other things, the following elements are used for quality indicators: frequency of transport, interval between vehicles, required number of vehicles on the line and travelling speed. In the continuation of the article, we will discuss only the interval, which is one of the most important elements for passengers.

The interval is the time interval between vehicles on the line. The smaller the time interval between vehicles, the more often the vehicles follow each other and thus the demand is harmonized with the supply of transport on an individual line. Simply put, this means the frequency of vehicles on the line (frequency of vehicles in a unit of time) and the more vehicles on the line follow each other, the more likely it is that the passenger will meet the driving time. The interval is expressed by the time distance between two vehicles on the line. Chart 2 shows the line data for CeleBUS.

In June 2019, the CeleBUS system carried 15,152 passengers on five lines. Most passengers were transported on the line Celje ŽP-Hudinja-Celje ŽP, namely 5,564. They are followed by the line Celje ŽP – Nova vas Lidl – Celje ŽP with 4,761 passengers and the line Celje ŽP - Ostrožno GD - Celje ŽP with 3,441 passengers and the rest 1386 (11). Line 6 was not yet operational at that time. The vehicle capacity was 96800 passenger seats. The values were also different: line 1, 2, 3 - 20 min, line 4 - 40 min and line 5 - 60 min. And the network of lines was less branched. If we compare a number of passengers carried and a number of population, we can record the growth rate of passengers, which is:

$$r = \frac{15152}{37875}$$

$$= 0.4$$

We did not analyse the data for the first period in 2020, as the operation of JLPP was interrupted during the epidemic in Slovenia. However, it would make sense to monitor the volume of passenger transport on a monthly basis. The growth rate and unevenness of passenger transport would be monitored. The values obtained would be an indicator of the quality of transport and, in the event of a decline in value, measures would be taken to improve the situation.

Chart 2: Dynamic line elements, 2020

Line	Vehicle capacity (seats and stands)	Number of rides per day - workdays	Current vehicle intervals (min)	Technical vehicle capacity (passengers/day)	Technical vehicle capacity (passengers/week/work days)	Technical vehicle capacity (passengers/month/ 22 days)

Line 1	40	27	30	1080	5400	23760
Line 2		28	30	1120	5600	24640
Line 3		28	30	1120	5600	24640
Line 4		18	40	720	3600	15840
Line 5		9	60	360	1800	7920
Line 6		12	60	480	2400	10560
Sum		122		4 880	24 400	107 360

4 Conclusion

PPT is one of the most important factors for the implementation of the principles of sustainable mobility. Around the world, certain cities have already started restricting personal motor traffic on certain city streets - city centres. So these streets are for non-motorized traffic. However, it should be borne in mind that the pedestrian is limited by the length of the pedestrian walk. Thus, it is necessary to place the city line system in the city cores in a correct and friendly way. This is elegantly arranged with an underground transport subsystem, but this cannot be realized in every city. Thus, it is necessary to look for the ideal management of public liner passenger transport in all segments of techniques and technologies.

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AVTOSOOBRAĆAEN UČILIŠEN CENTAR
“Boro Petruševski” - Skopje

Shipping and safety of hazardous materials by AIR

ISPORAKA I BEZBEDNOST NA OPASNITE MATERII VO VOZDUŠNIOTTRANSPORT

- seminarski trud -

Izrabotil:
M-r. Snežana Božinoska Risteska *dipl. soob. inž.*

Skopje 2021.

IZRABOTIL:

M-R. SNEŽANA BOŽINOSKA RISTESKA DIPL. SOOB. INŽ.

Skopje 2021

APSTRAKT

Ovoj trud opfaќa prakticni soveti i postapuvanja so opasni materii koi se transportiraat so vozdušni prevozni sredstva. Trudot sodrži kratka istorija za vozdušni soobraќaj i početocite naprenesuvanje na opasni materii so ostanatite soobraќajni granki kako i so poseben osvrt na vozdusniot soobraќaj. Opšti podatoci za opasnite materii, nivna klasifikacija, grupi na pakuvanje kako i mnogu korisni soveti za postapuvanje so opasnite materii pri transport so vozduhoplovi.

Klučni zborovi: opasni materii vo avion, isporaka so avion, šteta vrz lugjeto i okolinata.

VOVED

Opasni materijali možat da se najdat nasekade. Tie se sretnuvaat skoro vo sekoj dom i vo poveќeto bolnici i fabriki. Opasnite materii se isporačuvaat sekoj den preku kopneni, vozdušnii morski patišta. Tie čestopati se koristat za ispituvanje na cevkovodi (katodna zaštita) i dr.
Ako istečat, opasnite materijali možat da predizvikaat šteta vrz lugjeto, okolinata,infrastrukturата i imotot. Nivniot potencijal za šteta postoi bez ogled na toa dali opasnite materii se osloboduvaat slučajno, nesakano, požar ili nastan povrzan so vremenskite uslovi.
Incidentite so opasni materii vlijaat vrz niza zasegnati strani vo celata zaednica. Rabotnicite vo prostoriite koi redovno koristat ili rakuvaat so opasni materii, prevoznici, prvi primači i ispraќači, site se izloženi na opasnost po zdravjeto.
Regulatorite širum svetot koristat spisok kreiran od Obedinetite nacii za da gi klasificiraatopasnite materijali vo devet kategorii: eksplozivi, gasovi, zapalivi tečnosti, zapalivi cvrsti materii, oksidizatori i infektivni materii, radioaktivni materijali, korozivi i drugi materii klasificirani kako „razni“.
Ako ispraќate burinja so industriski hemikalii, kutii so ognomet ili boci so kislorod, veќe znaete deka stanuva zbor za opasni predmeti. No, i mnogu proizvodi od sekojdnevieto sodržat opasni materijali. Primer, lak za kosa (aerosolni, boci koi sodržat gas), sredstvo za dezinfekcija naracete (zapalivo), boja na baza na maslo (isto taka zapalliva) ili fotoaparat so litiumski baterii (koi ponekogaš se palat ili eksplodiraat). Nekoj predmet može da stoi na policata vo vašiot dom so godini, no koga e vreme da go stavite proizvod vo avion, treba da znaete deka toj pretstavuva opasnost.
Iako mnogu regulativi za opasnite materii se isti za site vidovi na transport, postojat nekoiznačajni razliki vo vozdusniot soobraќaj. Na primer, nekoi opasni proizvodi nikogaš ne sedozvoleni vo avioni, iako e legalno da se prevezuvaat na brod ili vo kamion. Nekoi proizvodi se dozvoleni vo avionite so site tovari, no ne i vo patničkite avioni. Bezbednost na tovarot i sprečuvanje na transport na neprijavena opasna stoka e odgovornost na site.

1. KRATKA ISTORIJA ZA TRANSPORTOT NA TOVAR SO AVION

Avionskiot transport e edna od najpopularnite dostapni opcii za transport. Istorijata na vozdušniot soobraќaj e relativno kratka vo sporedba so vodniot transport na tovar. Dviženjeto na stokite po

more može da se razgleduva iljadnici godini nanazad, što ukazuva na negovoto dolgogodišno postoenje. Avionskiot prevoz, spored ova treba da go razgleduvame samo vo minatiot vek.
Prvata tovarna pratka, so avion, poletala na neboto pred poveḱe od eden vek, vo 1910 godina. Koga edna trgovska kuḱa od Amerika odlučila da prenese 200 kilogrami svila na rastojanie od 65 milji od Dejton do Kolumbos. Avionot „Model B“, koj go pronajdoa poznatite braḱa Rajt, se dvižel paralelno so ekspresen voz, za da se vidi čija brzina e pogolema. Avionot pobedil i jasno mu dokažal na svetot deka vozdušniot prevoz može da bide održliva opcija za transport, so dopolnitelni izmeni vo 1911 godina. Obidi za transport na vozdušna pošta se slucuvale i vo Indija i vo Velika Britanija. Vo Velika Britanija, ednomesečna služba za vozdušnaplovidba se održala kako del od slavenjeto na krunisuvanjeto za kralot Džordž V. Prenesuvajḱi pošta na vozdušno rastojanie od 21 kilometar od London do Vindzor.
Za vreme na vojnata imalo značitelni vlozuvanja vo avionskata tehnologija. Avionite bile od suštinsko značenje za transport na vojnici, oružje i materijali na dolgi rastojanija.
Na krajot na vojnata, bilo formirano Meǵunarodnoto združenie za vozdušen soobraḱaj (IATA). Ova bilo i periodot koga započnale da se pojavuvaat aviokompanii „Ol-kargo“. Vo 1968 godina, okolu dve decenii podocna, avionskata-kargo-industrija go proizvela i kargo avionot. Lansiranjeto na Boing 747, ovozmožil nosenje nad 100 toni tovar na posebni paleti za avioni. Kargo avionite imaat vrata na nosot od avionot, koja ovozmozuva tovarenje na pogolemi količini na tovar.

Fedex, DHL i UPS se iminja poznati širum svetot so koi se prenesuvaat mali no brzi pratki.Brzite pošti kako prethodno spomenatite koi nosat mali pratki a im e potrebna brza dostava, izbraatavion.

Pratki od 32 kilogrami koi stignuvaat za pomalku za 2-3 dena, ne možat bez tovarnite avioni.

So podemot na internetot i globalnite igrači kako Amazon, Alibaba i E-bej, ovie mali ispraḱači prodolžuvaat da rastat na ovoj pazar blagodarenie na avionskiot kargo transport.
Istorijata na vozdušniot soobraḱaj značitelno se promeni vo tekot na 20 vek. No, zabeležano e deka vozdušniot prevoz prodolžuva da se razviva i na početokot na 21 vek.
Internetot navistina go otvori svetot kako globalen pazar. Nikogaš ne bilo polesno da se uvezuvaatili izvezuvaat stoki. Aviokompaniite nudat brz način za prenesuvanje na stoki od procesot na proizvodstvo do celiot svet.

2. MOŽNOSTI NA GLOBALNATA TRGOVIJA

- Avionot ovozmožuva slobodno dviženje na luǵe i stoki niz celiot svet;
- Avionot im dava sloboda na delovnite subjekti da gi prodavaat svoite dobra na globalnite pazari. 6,7 trilioni dolari vo meǵunarodnata trgovija se preneseni so avion vo 2019 godina.
- Avionot nè osloboduva od geografskite ograničuvanjata, rastojanieto i vremeto. Toa ni ovozmožuva da vodime podobar život i go pravi svetot podobro mesto za živeenje.
- Avionot nè ovlastuva da go istražuvame svetot, da pravime delovni aktivnosti na globalno nivo i da gi zbogatime našite životi.
- Avionot gi obedinuva semejstvata i najbliskite i sozdava možnosti za pogolemo razbiranje meǵu kulturite.
- Vozduhoplovnata povrzanost nosi stoki na pazarite i e od vitalno značenje za onie na koi im e potrebna pomoš. Po vrednost, tretina od stokite so koi se trguva meǵunarodno patuvaat po vozdušen pat.

Aviokompaniite prevezuvaat nad 52 milioni toni stoka godišno, što pretstavuva poveḱe od 35% od globalnata trgovija po vrednost, no pomalku od 1% od svetskata trgovija po obem. Toa e ekvivalentno na stoka vo vrednost od 6,8 trilioni dolari godišno, ili 18,6 milijardi amerikanski dolari

stoka sekoj den.
Specijaliziranite špediteri za vozdušen soobraќaj, možat da obezbedat povolni kargo ceni strucno rabotejќi na ovaa problematika. Prenesuvanjeto na teški tovari po more, e sè ušte poevtinamoznost. Golemite dimenzii na pakuvanjeto kaj ovoj kargo transport možat da obezbedat značitelna zašteda na trošocite, no nedostigot na brzinata i rizikot se pogolemi kaj ovoj vid na transport. Vozdušniot transport vo ovoj pogled moze da dade podobra ponuda.

3. TEHNOLOGIJANA TRANSPORT NA KONTEJNERI SO SREDSTVATA ZA VOZDUSEN TRANSPORT

Vozdušniot soobraќaj vo meģunarodniot stokoven prevoz seušte opfaќa mal procent od ogromnite količestva na stoka koja se prevezuva pomeģu različnite zemji. Isto taka, ova važi i koga e vo prašanje stokata smestena vo kontejneri, odnosno kontejneriziranata stoka. Sepak, vozdušniot soobraќaj učestvuva vo odredeni slučai koga stanuva zbor za transportot na kontejneri.

Spored toa, transportot na kontejnerite so vozdušnite transportni sredstva se izdvojuva kako posebna tehnologija. Ovaa tehnologija e voobičaena koga stanuva zbor za transport na kontejnerite za voeni potrebi, posebno transport do nepristapni i teški tereni.

Pri primenata na tehnologijata na transport na kontejnerite so sredstvata na vozdušniot transport, kako sredstva so koi se realizira transportot se pojavuvaat:

» tovarnite avioni,
» patničkite avioni (na dolnata platorma)
» helikopteri so golema nosivost i
» specijalni helikopteri.

Tovarniot avion (poznat i kako KARGO avion, avion špediter, avion so tovar) e avion so fiksni strani što e dizajniran ili konvertiran poveќe za prevoz na tovar otkolku za patnici. Takvite avioni obično ne se komforni za patnicite i imaat edna ili poveќe golemi vrati za tovaranje na stoka. Tovarnite prevoznici možat da bidat: civilni ili kargo-aviokompanii, privatni lica ili vooruženi sili na oddelni državi .

Osobeno e značaen transportot na kontejenrite so avionite. Pri toa, denes se sreќava vozdušen transport na standardni ISO kontejneri koi se prevezuvaat so širokotrupnite avioni, no osobeno e izrazen vozdušniot transport na specijalnite avio kontejneri (avio – modul kontejneri) koi se konstruirani taka što odgovaraat na trupot na avionite, a so toa se zgolemuva stepenot na iskoristuvanje na tovarniot prostor od avionite.

Vrz osnova na toa, koga stanuva zbor za prevozot na kontejnerite vo vozdušniot soobraќaj,togaš sosema e jasno deka od vitalno značenje se tipovite na avio – modul kontejnerite koi najmnogu se koristat denes, kako i avionite so koi istite se prevezuvaat.

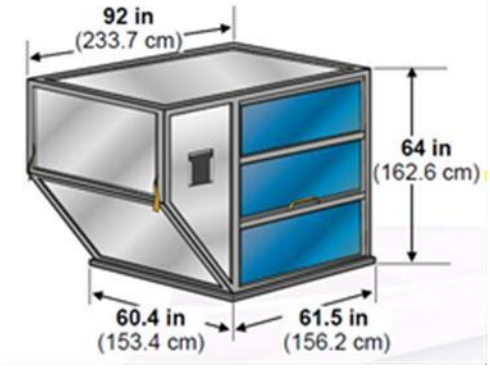
3.1 Најчесто upotrebuvani avio-modul kontejneri

ULD – unit load device - tovarna edinica

U	(Tip na kontejner - Non-Structural Container (Igloo)
L	Golemina na osnova - 1,534 mm × 3,175 mm
D	Strain i visina - Main Deck, 2,438 mm × 2,997 mm

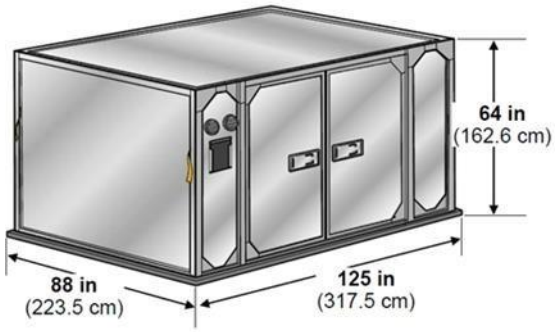
ULD doaǵaat vo dve formi: paleti i kontejneri. ULD paletite se so osnova od aluminium so dizajnirani venčinja da se zaklučat na držačite za tovarnite mreži. Kontejnerite ULD, poznati ikako limenki, se zatvoreni sadovi izraboteni od aluminium ili kombinacija od aluminium (ramka)i leksan dzidovi, koi, vo zavisnost od prirodata na stokata što treba da se transportira, može da imaat vgradeni edinici za ladenje. Primeri za voobičaeni ULD i nivnite specifiki se navedeni podolu.

Најчесто upotrebuvani avio – modul kontejneri vo denešniot avio - prevoz: **LD – 1, LD – 2, LD – 3, Insulated LD – 3, LD – 4, LD – 6, LD – 8, LD – 9, LD – 9 Reefer, LD – 11, A – 2, AQ – 6, AQ – 7, M – 6, LD – 26 и LD –29.**



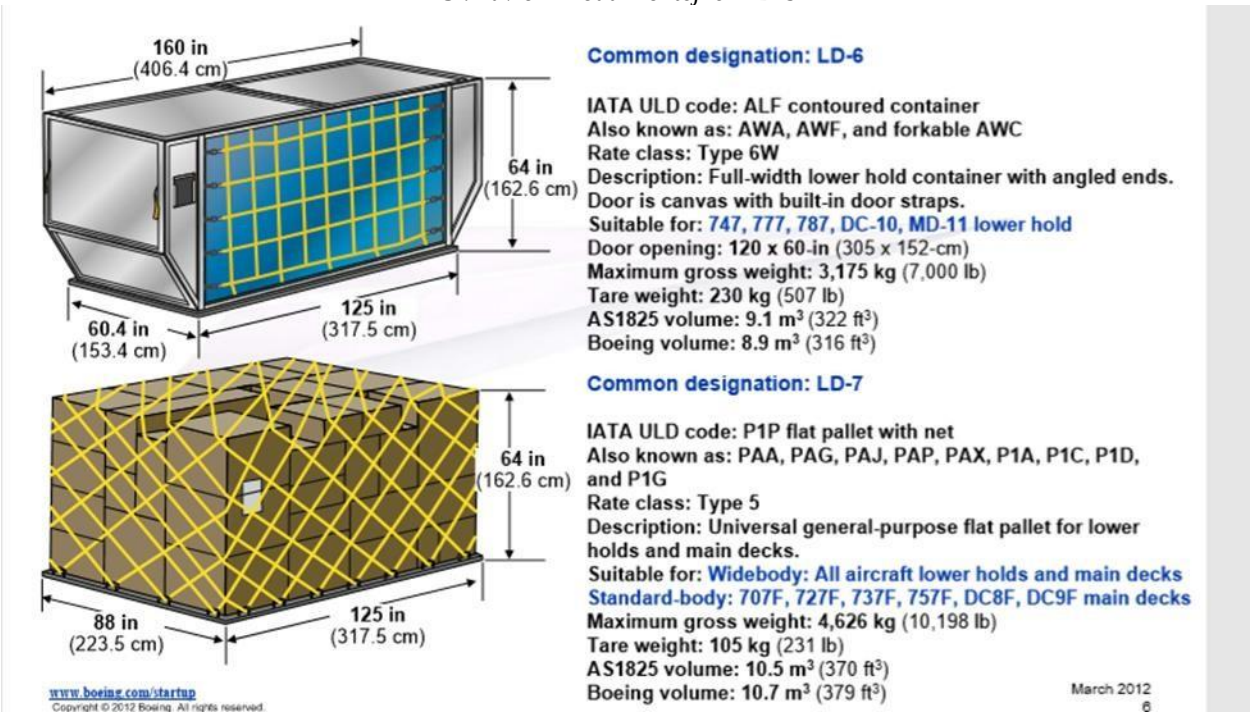
Класификација: LD-1
IATA ULD код: AKC Contoured Container
Компатибилен со авионите: B747, B767, B777, MD-11
Внатрешен волумен: 4.8 m^3
Максимална бруто маса: 1 588 kg

Sl.1 avio – modul kontejner LD-1



Класификација: LD-9 Reefer
IATA ULD код: RAP Cool Container on P1P base
Компатибилен со авионите: B747, B767, B777, DC-10, MD-11
Внатрешен волумен: 9.6 m^3
Максимална бруто маса: 4 626 kg (LD)
6 000 kg (MD)

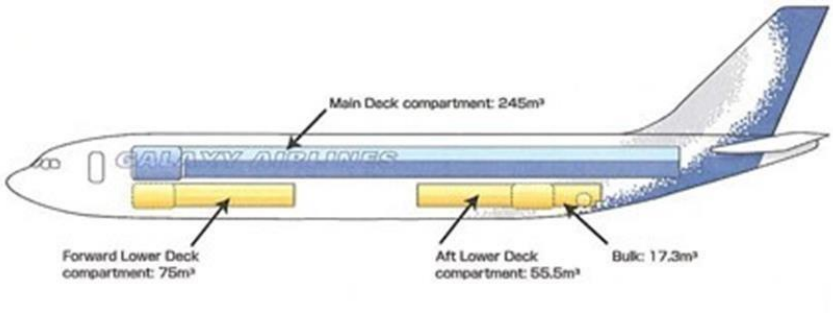
Sl.2 avio – modul kontejner LD-9



Sl.3 Drugi avio – modul kontejner LD-6 i LD-7

Od prethodno pretstavenite avio-modul kontejneri koi najčesto se primenuvaat vo vozdušniot soobraќaj može da se zabeleži deka najčesto upotrebuvani avioni za prevoz na avio- modul kontejnerite se: Boeing 747, Boeing 767, Boeing 777, McDonnell Douglas DC-8, McDonnell Douglas DC-10, McDonnell Douglas MD-11, Lockheed L1011, Airbus A300, AirbusA310, Airbus A330, kako i Airbus A340.

10-te najgolemi kargo avioni vo svetot se: Antonov An-225 **Mriya**, Antonov An-124 **Condor**, Antonov An-22 , Aero Spacelines Super **Guppy**, Airbus A300-600ST **Beluga**, Airbus A400M **Atlas**, **Lockheed C-5 Galaxy**, Lockheed Martin C-130J **Super Hercules**. **Vo RS Makedonija najčesto koristeni avioni se AN26 Antonov 26 koj prevezuva i patnici i tovar i Boeing 737 koj prevezuva isto patnici i stoka. DHL koristat samo kargo avioni.**



Slika 4. Transporten avion so lokacija na tovarnite platformi (glavna platforma, predna dolna platforma i zadna dolna platforma)

4. MAL OSVRT NA AVIONSKATA INDUSTRIJA KON KRIZATA SO COVID-19

Od početokot na krizata so COVID-19, vozdušniot tovar e klučen partner vo isporaka na potrebnite lekovi, medicinska oprema (vklučitelno i rezervni delovi / komponenti za popravka) i vo održuvanjeto na funkcioniranjeto na globalnite lanci za snabduvanje za poveќeto specifični stoki. Ova e postignato so posebno planirani operacii so tovarot, iskoristuvanje na kargo kapacitetvo patnički avioni i pomošni letovi do pogodenite oblasti.

Klučno bese da se obezbedi neprečena isporaka na kargo. So namaluvanjeto na pobaruvačkata i otkažuvanjeto na patničkite letovi, isčezna vitalniot kapacitet za vozdušniot tovar.Aviokompaniite gi prezedoa site merki za da se zadovoli preostanatata pobaruvačka na stoka. Za žal, aviokompaniite se soočija so tesni grla pri dobivanje soodvetni dozvoli i ekipaži za tovarni letovi vo uslovi na karantin. Rezultatot beše odložuvanje na pratkite koga vremeto e od suštinskoznačenje za borbata protiv epidemijata COVID-19 i održuvanje na globalnite sindžiri za snabduvanje.

Predizvicite na industrijata bea jasni, se obezbedija seopfatni upatstva koi trebase brzo da se ispočituvaat, za da se dobijat dozvoli za rabota. So samoto toa i potvrda deka ekipažot na vozduhoplovot e vo sostojba efikasno da raboti vo isklučitelni situacii i vo karantin.

Slika 5. Tovarenje na transporten avion so novite COVID -19 merki

5. ISTORIJA ZA TRANSPORTOT NA OPASNITE MATERII

Od sredinata na 1800-tata, svetot se bori so opasnostite i teškotiite pri transport na opasni materii. Reguliranjeto na transportot na opasni materijali započnalo glavno bez nadzor i so golemi nedoslednosti, što dovelo do ogromni katastrofi. Ottogaš, bile vospostaveni unificirani regulativi koi značitelno go namalile katastrofalnoto vlijanieto vrz luǵeto i okolinata od izlevanjata na opasnite materii.

Najranite regulativi za transport na opasni materii se zasnovale na angliskite pravila i običai,spored koi „ispraќačot ne smeel da tovari opasen tovar što može da go ošteti brodot, bez znaenje ili soglasnost na prevoznikot“. Vo 1871 godina vo Amerika bil donesen Federalen zakon so koj se

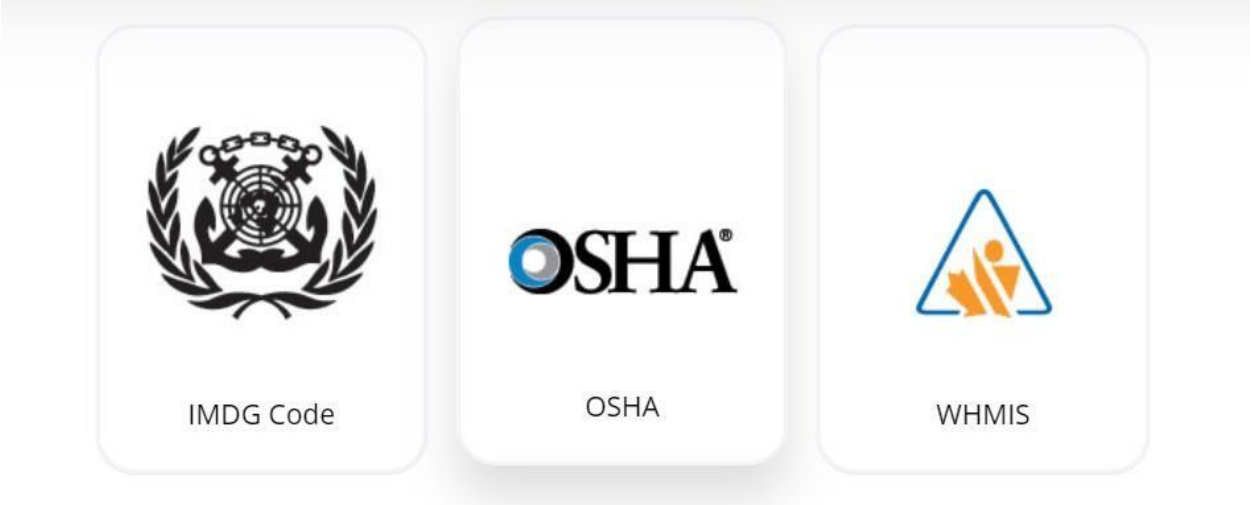
zabranuvalo transport na opasni i zapallivi materii na patnički brodovi. Vo 1887 godina bila formirana Meǵudržavna komisija za trgovija, koja napravila unificirana regulatorna agencija za nadgleduvanje na transportot na opasni materijali na železničkite prugi, no vo tekot na slednite 40 godini gi vklučila site vidovi na transport, kako što se železnica, voda, pat i vozduh.
ICC bila i prodolžila da bide agencija što go nadgleduva transportot na opasnite materii poveḱe od sto godini, vospostavuvajḱi nacionalni standardi za pakuvanje, obeležuvanje, polnenje irakuvanje so eksplozivi i drugi opasni materii.

Evropskata regulativa za obuki i pravila koi treba da se pocituvaat vo vrska so opasnite materii se slednive: *Regulativa (EU) br. 965/2012 za vozdušni operacii, Aneks III (Del ORO), Aneks IV (del CAT), Aneks V (Del SPA), Aneks VI (del NCC), Aneks VII (del podoficer)*

6. ISPORAKA NA OPASNI MATERII PO VOZDUH

Meǵunarodnite pratki mora da se usoglasuvaat so tehničkite upatstva na ICAO (Meǵunarodna organizacija za civilno vozduhoplovstvo), kako i so nacionalnite propisi. So cel da se ispolnat komercijalnite standardi, od isporačuvačite se bara da gi ispolnuvaat regulativite za opasni materii IATA (Meǵunarodna asocijacija za vozdušen transport).
Pravilata se napišani od ICAO, i se narekuvaat Tehnički upatstva za bezbeden transport naopasni materii po vozdušen pat. IATA e trgovsko združenie na aviokompanii što gi zema tehničkiteupatstva i gi stava vo format što e lesen za upotreba i razbiranje. Propisite za opasni materii IATA gi vklučuvaat site tehnički upatstva na ICAO i nekoi ograničuvanja na aviokompaniite koi ne se definirani od ICAO. Bidejḱi aviokompaniite členki na IATA gi koristat regulativite za opasni materii na IATA, ova treba da bide vo soglasnost so ispraḱačite na avioni.
Globalnata isporaka na opasnite materii e sertificirana od Meǵunarodnata asocijacija za vozdušen transport (IATA) za ispraḱanje opasni materii po vozdušen pat. Ne usoglasuvanje so pravilata i propisite za pravilno pakuvanje, obeležuvanjeto i isporakata na opasni materii može darezultira so zaguba na vreme i pari. IATA postavuva globalen standard za bezbeden transport na opasni materii po vozdušen pat, i toj e edinstveniot standard što vo momentov go priznavaat aviokompaniite širum svetot.

7. SVETSKI REGULATIVI ZA ISPORAKA I BEZBEDNOST NA OPASNITE MATERII PO VOZDUH



Sl.6 Svetski regulativi za isporaka i bezbednost na opasnite materii po vozduh

8. KLASIFIKACIJA NA OPASNITE MATERII

1.Eksplozivi od klasa 1
2. Zapalivi i nezapalivi gasovi od klasa 2
3. Zapalivi tečnosti od klasa 3
4. Zapalivi cvrsti materii od klasa 4
5. Oksidizatori i organski peroksid od klasa 5
6.Otrovni ili zarazni supstancii od klasa 6
7. Radioaktivni materijali od klasa 7
8. Korozivni materijali od klasa 8
9. Ostanati opasni materii Klasa 9

Opasnite materii se narekuvaat skrateno HAZMAT (hazardous materials) i možat da bidatsuv mraz, eksplozivi, zapallivi materijali ili materii, litiumski baterii i hemikalii. Ne može da se kaže deka site opasni materii možat vednas da se zabeležat ili da se deklariraat kako takvi. Postojatpoveќe primeri na voobičaeni predmeti što se kvalifikuvaat kako opasna stoka a poveќeto luѓe neuspevaat da gi prepoznaat kako što se: odredeni masla, lakovi i parfemi. Ovie predmeti se zapallivi i baraat soodvetno pakuvanje za isporaka. Obično se misli deka opasni materii se onie što gi ispraќaat hemiski kompanii, kompanii za gas i farmacevtski kompanii ili laboratorii za istražuvanje, no vistinata e deka bilo koj tip na kompanija može da ima potreba za isporaka na opasni materijali ili opasna stoka vo odreden moment, vklučuvajќi kozmetika, maloprodažba i kompanii za hrana.

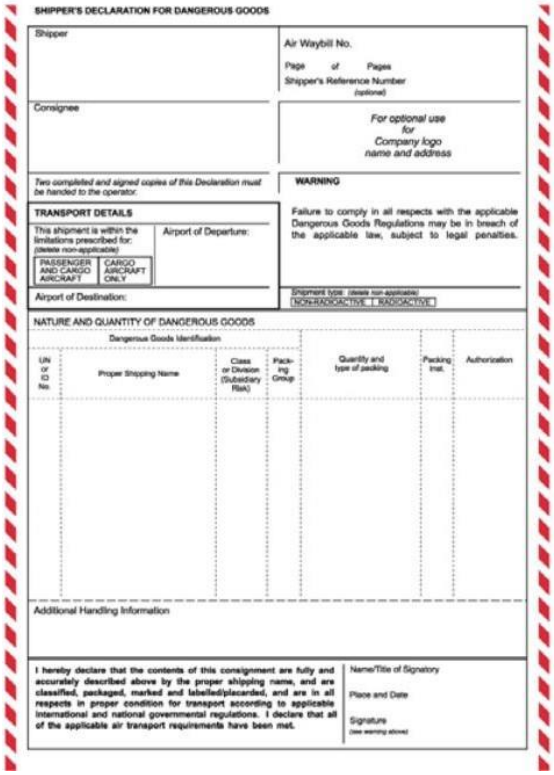
8.1. Dokumenti potrebni za prevoz na opasnite materii

Potrebni se dopolnitelni dokumenti za isporaka na opasni materii ili opasni materijali.
Nekoi od ovie stavki vklučuvaat:

• Informacii za registracija;
• Regulativa, specijalni dozvoli i broevi za kontakt so institucii.

* Beleška - Vo avionskata industrija izrazot sinonim na izrazot Opasni materii se koristi terminot Hazardous materijal.

- Trgovski dokumenti;
- UN, PSN (proper shipping name), PG;
- Telefonski broj za itni slučai;
- Snimena evidencija.



SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper

Air Waybill No.

Page of Pages

Shipper's Reference Number (optional)

Consignee

For optional use for Company logo name and address

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT

CARGO AIRCRAFT ONLY

Airport of Departure:

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.

Airport of Destination:

Shipment type: (delete non-applicable)

NON-RADIOACTIVE RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Packing Group	Quantity and type of packing	Packing Inst.	Authorization

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.

Name/Title of Signatory

Place and Date

Signature (see warning above)

Sl.7 avionska deklaracija so crveno-beli rabovi

8.2.Opasnite materii mora da bidat klasificirani za transport

Za polesno utvrduvanje koga nekoja materija e opasna za transport, gi koristime 9-te različni klasi na opasnost. Sekoja od ovie klasi na opasnost ima svoi tehnički i naučni kriteriumi.

Pri istraga ili inspekcija na transportot na opasni materii najčesti nedostatoci se javuvaat kaj:

- Klasifikacijата;
- Dokumentiте za isporaka;
- Pakuvanjата;
- Obukata na personalot.

Potrebna e i lista so bezbednosni podatoci kako:

- Ime na soodvetnata isporaka
- Klasa na opasnosta
- Grupa na pakuvanje
- UN broj

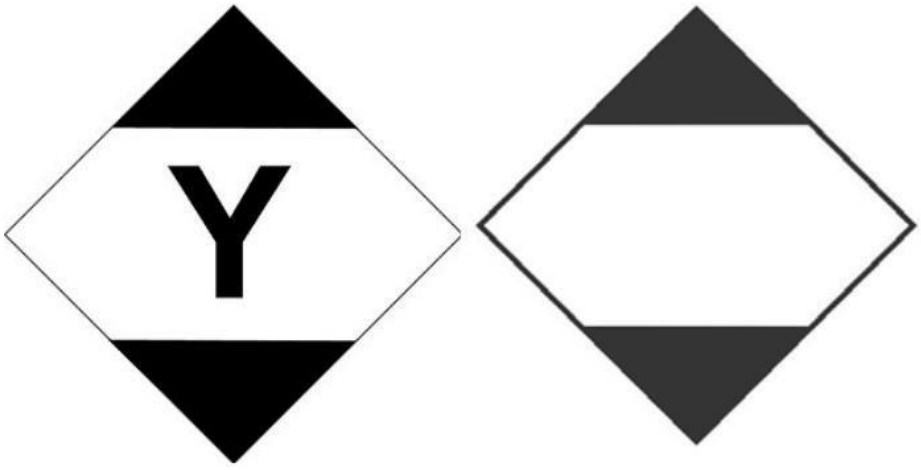
9. PAKUVANJE NA OPASNITE MATERII

Vozdušniot tovar što sodrži opasna stoka mora da bide pravilno spakuvan vo soglasnost so meǵunarodnite propisi. Nekoi voobičaeni materijali za pakuvanje opasni materii vklučuvaatčelični korpi, plastični bokali i kutii izraboteni od posebni vlakna.
OON gi postavuva standardite za slednive grupi pakuvanja:

- Grupa na pakuvanje I - Golema opasnost: Potrebno e najdobro zaštitno pakuvanje i stokata od ovaa kategorija ne smee da se ispraḱa vo istiot kontejner ili na istiot avion so drugi materii od istata grupa.
- Grupa na pakuvanje II - sredna opasnost.
- Grupa na pakuvanje III - mala opasnost. Potrebna e najmala količina zaštitna ambalaža.

Koga se pakuvaat opasnite materii treba da se vnimava na precekoruvanje na ograničuvanjeto na količinata, vklučuvajḱi go i vnatrešnoto pakuvanje, upatstvata za zatvoranje, cvrsti ili tečni materii, kako i vidot na pakuvanjeto.

9.1.Postapka za pakuvanje na opasnite materii



Sl.8 Oznaka za ograniceni kolicini na pratkata pri transport so avion

Vozduhoplovnata bezbednost zavisi od isporakata na opasnite materii vo pravilnoto pakuvanje. Ako izberete pogrešno pakuvanje, može seriozno da go oštetite transporterot, da mu naštetite na životnata sredina ili da predizvikate katastrofalna šteta na avionot.

Soodvetnoto pakuvanje na opasni materii se zasnova na najsoodvetnata klasifikacija na opasnosta na proizvodot i negovite fizički karakteristiki. Na primer, ne možete da ispraќate korozivni materii vo metalni pakuvanja bidejќi korozivnite materii nasilno reagiraat so metal i nakrajot ќe go uništat paketot.
Baranjata za pakuvanje variraat vo zavisnost od vidot, klasata i količinata na opasnta materija sto ja prenesuvate. Čestopati, pakuvanjeto mora da bide testirano i zavereno za da gi ispolni baranjata na propisite za isporaka na opasni materii po vozduh. 49 CFR, Del 173 gi naveduva opštite baranja za pakuvanje što se primenuvaat na ambalažata od golemo i ne-golemo, novo i povtorno upotrebuvano pakuvanje i specifikacija i nespecifikacija na pakuvanjeto.
Soodvetnoto pakuvanje zavisi i od grupata na pakuvanje na materijata. Grupata na pakuvanje e grupa na supstancii (osven onie vo Klasa 2, Klasa 6. 2 i Klasa 7), vo soglasnost so stepenot na opasnost što tie go pretstavuvaat:

- Grupa na pakuvanje I: supstancii što pretstavuvaat golema opasnost;
- Grupa na pakuvanje II: supstancii koi pretstavuvaat sredna opasnost; i
- Grupa na pakuvanje III: supstancii so mala opasnost.

Potrebno e pakuvanje soodvetno na specifikaciite na OON, ili **pakuvanje orientirano kon performansi** (POP), za poveќeto vozdušni pratki so opasni materii. POP e pakuvanje koe mora da pomine nekolku testovi za da se utvrdi deka pakuvanjata se dovolno silni za da možat da gi izdržat udarite, tovarite i promenite vo atmosferskiot pritisok što obično se pojavuvaat za vreme na transportot.

Paketite koi uspešno gi pominale ovie testovi nosat oznaki na OON za da potvrdat deka gipominale potrebnite testovi. Oznakite go označuvaat nivoto na testiranje što go pominal paketot. Poglednete ja Tabelata so ID na paketot (podolu) za da vi pomogneme vo utvrduvanjeto na pravilnata identifikacija na pakuvanjeto.

Ova se postapkite pri utvrduvanje dali paketot e dozvolen za upotreba:

1. Pobarajte go Pravilnoto ime za isporaka (PSN) vo tabelata za opasni materijali (HMT) vo 49 CFR ili spisokot so opasni materii vo ICAO TI.
2. Pronajdete gi i sledete gi soodvetnite informacii i upatstva za pakuvanje vo kolonata 8 na HMT ili kolonata 10 na TI.
3. Proverete dali paketot e pravilno obeležan.
4. Proverete dali paketot e ovlasten za PG označen vo HMT.
5. Proverete dali kolonata 7 „Specijalni kodovi za odredbi“ ili kolonata 9 „Odredbi za pakuvanje“ ne go ograničuva ponatamu paketot

9.2.Tipovi na pakuvanje

- Pocituvanjeto na pravilata za **oddeluvanje** – Proverete dali ste spakuvale opasni materii so nekompatibilni opasni materii, što možat da reagiraat opasno so drugi opasni materii.
- Mora vnimatelno da gi sledite informaciite vo upatstvata za zatvoranje na paketot.

Proizvoditelite na pakuvanjata gi testiraat istite so specifikacii na OON so materijalite navedeni

vo upatstvata za zatvoranje. Promenata na upatstvata na proizvoditelot za zatvoranje može da go zagrozi integritetot na paketot i da rezultira so neusoglasenost.

• Proverete dali paketot ne ja nadminuva testiranata težina na pakuvanjeto (vo kilogrami). Vidi podolu:

UN1A2 / Y23 / S / 93 / SAD / + AA1234
Testirana grupa za pakuvanje UN1A2 i maks. bruto masa (kg) »Y23

9.2.1.Kade može da se nabavi soodvetno pakuvanje za opasni materii?

Možat da se kupat pakuvanja za isporaka na opasni materii po vozdušen pat, preku različni komercijalni izvori. Bidejќi FAA e vladin subjekt, ne možeme da odobri ili da preporača specifičen izvor za snabduvanje na pakuvanje što ќe gi ispolnuva regulatornite baranja na materijalite. Sepak, prodavačite se lesno dostapni na Internet.

9.3. Primeri za oznaki na OON

Oznaki za CVRSTI MATERII:

»4GV

Kod na OON za kutija izrabotena ploci od presuvani vlakna, Fiberboard Box (vlakna od drvo ili drugi rastitelni vlakna) (4G) i promenlivi vnatrešno-kontejnerski materijali i konfiguracija (V)
»S – Cvrsti materii ili vnatrešni pakuvanja.
»SAD - Ovlastena oznaka za Država / zemja
u
n 4GV/X13/S/08/USA/+AQ2121Obedineti nacii

U N symbol na pakuvanjeto za Obedinetite Nacii»OON
»X13 - Grupa na pakuvanje testirana na maks. bruto masa (kg)
»08 - Posledni dve cifri se odnesuvaat na godinata na proizvodstvo
»AQ2121- Sertificiran paket od proizvoditelot

Oznaki za TEČNOSTI:

u

n1A1/X1.5/250/12/USA/M4071Materijali »A.

»1- Vid na pakuvanje
»1 - Kategorija
»1.5 - Maksimalna bruto masa ili specifična gravitacija
»12 - Godina na proizvodstvo
»M4071 – Kod za specifikacija(potvrduvanje) od proizvoditelot
» A - Material
»X - Grupa na pakuvanje
»250 - Hidrostatski pritisok na testot ili „S“ za cvrsti materii

»USA- Zemja na proizvodstvo

9.4. Nekolku korisni soveti za vrabotenite koi učestvuvaat vo site fazi kako i vo transportot na opasni materii

Pred da ja predadete opasnata materija na avioprevoznik za isporaka, spored propisite za opasni materii, od ispraќačot, se bara pravilno da gi klasificira, spakuva, obeleži (obeležuvanje napaketite) za da ja identifikuvate opasnosta.
Koga se ispraќaat opasni materii (na pr., Litiumski baterii ili uredi što rabotat na baterii, aerosoli, boci so kislorod) ili zapalivi tečnosti (na pr., Parfemski proizvodi ili alkoholni pijaloci), treba da se sledat odredeni postapki za da se potvrdi deka paketot e pravilno spakuvan i obeležan:

Čekor 1: Najdobro e da pocnete od Listata so bezbednosni podatoci za da se utvrdi dali predmetot što go ispraќate može da bide opasna materija. Obično, može da dobiete bezbednosni podatoci od proizvoditelot na materiite ili materijalite što planirate da gi ispratite avionski i da go proverite delot za informacii za transport. Obrnete osobeno vnimanie na specifičnite informacii što se odnesuvaat na pratkite preku vozduh.

Čekor 2: Ako utvrdite deka nekoj predmet e opasen, FAA (Federal Aviation Administration) vi preporačuva da napravite analiza na potrebite za da utvrdite koi vraboteni vo vašata kompanija ќeja izvršuvaat funkcijata za odreduvanje na opasnosta i da go identifikuvate nivoto na obuka što e potrebno spored propisite.

Čekor 3: Za poveќeto vraboteni, obukata ќe vklučuva opšta i bezbednosna svest, bezbednost i obuka specifična za funkciite. Tie sto raboatat so opasni materii treba da dobivaat redovna obuka na sekoi tri godini.

- Tehničkite upatstva na lCAO predviduvaat deka povtorlivite baranja za obuka za opasni materijali mora da se odvivaat vo rok od 24 meseci od prethodnata obuka za da se obezbedi kontinuitet na znaenja“.
- Vraboten vo oblasta OPASNI MATERII e lice vraboteno kaj rabotodavač na opasni materi ili lice koe e samostojno vraboteno i koe direktno vlijae na bezbednosta pri transport na opasnite materii, vklučuvajќi i lice koe: rastovaruva, istovaruva ili rakuva so opasni materijali ili opasni materii; Kako i dizajnira, proizveduva, proveruva, testira, povtoruva, obnovuva, poprava, modificira, obeležuva ili na drug način pretstavuva pakuvanja nameneti za upotreba pri transport na opasni materii;
  - Vraboteniot podgotvuva opasni materijali ili opasna stoka za transport;
  - E odgovoren za bezbednosta pri transport na opasni materijali ili opasni materii; ili
  - Raboti so vozilo što se koristi za transport na opasni materijali ili opasni materii.

Čekor 4: Vraboteniot treba da go razgleda materijalot vo Tabelata za opasni materijali za da utvrdi odobreni količini dozvoleni za isporaka, potrebni nalepnici i dozvolenoto pakuvanje i grupata na pakuvanje.

Čekor 5: Da se opredelat količinite i soodvetnite baranja za pakuvanje za pratkite. Vo zavisnost od grupata na pakuvanje odredena na opasniot materijal, može da bide potrebno pakuvanje so specifikacija na OON.

• Grupata na pakuvanje se odreduva spored stepenot na opasnost. Nivoto na izvedba gi identifikuva standardite za izvedba i uspešnoto testiranje na pakuvanjeto:
◦X - Za sostavot na pakuvanjeto Test za pakuvanje I, II i III. (Grupa za pakuvanje I - golema opasnost);
◦Y - Za sostavot na pakuvanje Test za pakuvanje Grupa II i III. (Grupa za pakuvanje II - sredna opasnost;)
◦Z - Za sostavot na pakuvanje Test za pakuvanje III grupa. (Grupa za pakuvanje III - mala opasnost)

Čekor 6: Ako e potrebno pakuvanje so specifikacija na OON, vnimatelno da se pročitaatupatstvata za zatvoranje na paketot i da se nabavat site materijali navedeni vo upatstvata, kako štose lenta, poštenski vrski, poli kesi, itn. Informaciite treba da se sledat vnimatelno. Paketite što gi ispolnuvaat specifikaciite na OON se testiraat so materijalite navedeni vo upatstvata za zatvoranje. Sekoja varijacija od upatstvata na proizvoditelot pretstavuva prekrsok i može da go zagrozi integritetot na pakuvanjeto.

Čekor 7: Otkako ќe utvrdite soodvetnoto pakuvanje, gi dobivate i soodvetnite oznaki, etiketi i deklaracija za materijata. Opšto zemeno, imeto na soodvetnata isporaka, brojot na OON i imeto i adresata na ispraќačot ili primačot treba da bidat označeni na pakuvanjeto na istata površina kakoi etiketata.

Čekor 8: Označete go paketot.

Čekor 9: Ako koristite kombiniran paket, stavete go materijalot vo negovoto vnatrešno pakuvanje vo soglasnost so upatstvata za zatvoranje. Potoa, stavete go vnatrešnoto pakuvanje vo negovoto ovlasteno nadvorešno pakuvanje i zapečatete go pakuvanjeto vo soglasnost so upatstvata za zatvoranje na pakuvanjeto.

Čekor 10: Popolnete ja ispratnicata i stavete ja na nadvorešnata strana od pakuvanjeto. Na primer, deklaracija na ispraќačot za zarazni supstancii.

Čekor 11: Vašiot paket e podgotven za ispraќanje.

Čekor 12: Čuvajte ja izjavata na ispraќačot vo dosie, za period od dve godini.

9.5 Prijavuvanje na nesreќa so opasni materii

Propisite za opasni materijali od vas baraat da prijavite odredeni vidovi na opasni materii ili nezgoda so opasni materii. Izveštaite za nezgodite se od vitalno značenje za bezbednosta vo transportot. Podatocite za izveštajot im ovozmožuvaat na regulatornite organizacii da gi identifikuvaat trendovite i novite bezbednosni rizici, pomagaat za utvrduvanje prioritetite i resursite zasnovani na rizik i da se identifikuvaat postojanite ispraќači na neprijavena opasen tovar.

9.6 Neposredno izvestuvanje za odredeni opasni materijali ili nesreќi so opasni materii

Od vas se bara da dostavite izvestuvanje (vo rok od 12 časa) do Nacionalniot centar odgovoren za opasni materii koga ќe se sluči nekoja od slednive nezgodi vo transportot, vklučitelno i tovarenjeto, istovarot i privremenoto skladiranje:

- Edno lice go izgubilo životot;
- Edno lice e primeno vo bolnica;
- Poširokata javnost se evakuira poveќe od eden čas;
- Golema transportna arterija ili objekt e isklučena ili zatvorena poveќe od eden čas;
- Promenet e operativniot let na avionot ;
- Se pojavuva radioaktivna kontaminacija;
- Se pojavuva somnitelna kontaminacija od zarazna materija (osven reguliran medicinski otpad);
- Ako se osloboduva zagaduvač na morinjata nad 450 L (119 litri) za tečnost ili 400 kg (882 lbs) za cvrsta materija;
- Baterija ili ured na baterija se zapali, nasilno puka ili ima eksplozija ili opasen porast na toplina za vreme na transportot so avion.

10. INFORMACII ZA IZGOTVUVANJE NA DETALEN IZVEŠTAJ ZA NESREĆISO OPASNI MATERII

Podnesete pismen izveštaj do Upravata za bezbednost na opasnite materii vo rok od 30 dena pri slednite nezgodi:

- Ako nastane bilo koja od okolnostite navedeni pogore, za koi e potrebno itno izvestuvanje;
- Nenamerno osloboduvanje na opasen otpad vo koja bilo količina;
- Koga specijalniot rezervoar za tovar so kapacitet od > 1000 litri e strukturno oštеten;
- Za vreme na transportot e otkrien neprijaven opasen materijal1;
- Baterija ili ured na baterija se zapali, nasilno pukne, ima eksplozija ili opasen porast na toplina za vreme na transportot.

Opasni materii (na primer, baterii, elektronika, suv mraz, aerosoli, proizvodi za široka potrošuvačka, zapalliva tečnost i sl.) Isprateni kako tovar što ne se soodvetno identifikuvani (t.e. obeležani, i dr.) Od strana na ispraќačot „neprijaveni“ Opasni materii.
Podnesete izveštaj do PHMSA preku Internet ili dostavete pismen Izveštaj za nesrekata soopasni materijali do Ministerstvoto za transport i vrski.
Dokolku incidentot se slučil za vreme na transportot so avion, dostavite kopija od izveštajot za nesreќata so opasni materii do FAA, dostavete kopija od izveštajot do FAA preku e-pošta:
9-AWA-AXH-Air5800-1
Reports@faa.gov.

10.1 Izveštaite treba da gi sodržat slednite infirmacii

Informacii za vidot na nesreќata (zaden del, stranično, prevrtuvanje, sudir i otkažuvanje na voziloto) i posledici od nesreќa (eksplozija, požar, isturanje i neizlevanje). Prethodnite studii ja podelija serioznosta na povredite vo pet kategorii; serioznost na nesreќata se smeta spored toa dali ima povreda, nema povreda, teška povreda ili smrt.
Kategorijata i količinata na opasnata materija što se transportira Informacii za vozačot (karakteristiki na vozačot, vozrasta i odnesuvanjeto.)
Informacii za lokacijata se: sostojbata na površinata kade sto se slučila nesreќata i lokacijata na nesreќata);
Posledno registrirana mestopolozba spored radarskata kontrola, blizina do nekoe naseleno mesto, pat, avtopat, krstosnica, tocni kordinati
Informaciite za voziloto se: vidot na avionot i brojot na avionic i vozila vklučeni vo nesreќa.
Informacii za okolinata se vremenskata ramka na nesreќata (čas, den i mesec), vidlivost (zora: od 5:00 do 6:59 časot nautro, den: od 7:00 do 16:59 časot, samrak: od 5:00 do 6:59 časot popladne i temno: od 19:00 do 4:59 časot nautro) i vremenskite uslovi (sončevo, oblačno, doždlivoi snežno, i magla i magla).

11.PRIEM NA OPASNI MATERII

Koga primate opasni materijali ili materii, sekogaš sledete gi ovie čekori pred da se potpišeteza niv:

- Potvrdete deka ste stručni za da go prifatite paќetot.
- Ako ne ste ja izvršile naračkata ili ne vi e dadeno prethodno ovlastuvanje da ja prifatite pratkata, ne prifaќajte ili potpišuvajte go paќetot.
- Pregledajte ja nadvorešnosta na site pakuvanja.
- Dokolku e zabeležano kakvo bilo fizičko oštetuvanje: isipuvanja, kapki, protekuvanje, boenje ili promena na bojata ne prifaќajte go paketot.
- Ako pakuvanjeto proizveduva silen miris, kontaktirajte strucni lica za ponatamošno postapuvanje.
- Ako sodržinata e nestabilna ili skršena pri rakuvanje, ne prifaќajte go paќetot.
- Pregledajte gi dokumentite za isporaka za da se osigurate deka se opišani predmetite.
- Ako predmetite ne se sovpaѓaat so opisot, ne prifaќajte go paketot.

Dokolku se zabeležat nesoglasuvanja ili oštetuvanja a ispraќačot odbie da go vrati paќetot,gi napuštil prostoriite ili e nedostapen, vednaš kontaktiraj ja **Direkcija za zatšita i spasuvanje** , nivnite vraboteni ќe vi pomognat vo rakuvanjeto so paketot vo soglasnost so propisite za transport i bezbednost.
Otkako paќetot e pregledan i prifaten, vednaš osigurajte go, pravilno skladirajte go za da se spreči kražba, gubenje ili oštetuvanje. Ne ostavajte go paketot nebezbeden.

Ne rakuvajte so kakva bilo sodržina spakuvana so opasni materii, osven ako ne ste bile pravilno obučeni za opasnostite što možat da bidat prisutni i kako da gi zaštitite vašeto zdravje i bezbednost. Ako otkriete ošteten, protečen ili otvoren kontejner so opasna materija otkako ќe dobiete go dobiete

pakuvanjeto vednaš kontaktirajte ja policijata sto vi e vo blizina i informirajte gi za vašata lokacija i situacija. Ostavete ja pratkata na bezbedna lokacija, ako imate pristap do aspirator, stavete go pakuvanjeto vnatre i zatvorete go pojasot i ne obiduvajte se so drugi aktivnosti dodeka DZS ne napravi procenka na situacijata.

ZAKLUČOK

Ako pogrešno se klasificirani, pogrešno označeni ili pogrešno spakuvani pratkite so opasnimaterii, najlošoto nešto što može da se sluči, navistina bi bilo lošo. Nepravilnoto pakuvanje možeda go zgolemi rizikot, proizvodot može da eksplodira, da se zapali, da oslobodi toksičen gas ili da predizvika drugi opasnosti vo tekot na letot, a toa e možno da predizvika katastrofa. Pogrešna deklaracija ili etiketa može da gi ostavi licata što se vo direkten kontakt so opasnite materii bez potrebnite informacii vo slučaj na nesreќa.

Vo najdobar slučaj, koga aviokompanijata ќe ja optkrie greškata, može da ja odbie pratkta.No togaš se trošat vreme i pari za da se popravi greškata. Ako na primer, pogrešno e obeležan paket-tovarot, togas toj ќe mora da se prenese na paleta, vo object, kade što davatelot na uslugi treba da ja pregleda i obeleži sekoja kutija. Potoa ovoj tovar trebada se rezervira i pretovari na druglet.

Davačkite za opasni pratki vo vozdušniot transport se navistina povisoki otkolku za običentovar. Dopolnitelniot trošok za greškata što e napravena nema da vi bide naglasien kako trošoktuku aviokompanijata ќe naplati poskapo za kilogram otkolku što bi se platilo za neopasna stoka.Za ispraќanje na tovar što ne smee da leta so patnički avion , se plaќa mnogu poveќe, bidejќi davačkite za prenesuvanje na tovar so ovion se sekogaš povisoki .

Koga se vrši planiranje za ispraќanje na opasen tovar po vozduh, prviot i najvažen čekor eda se angažira ovlasten profesionalec za opasni materii ili da se obuči nekoj od vrabotenite da ja prezeme taa uloga. Nikoj - nitu snabduvač, nitu logistička kompanija, nitu personalot na aviokompanijata - ne može da ja prezeme odgovornosta na ispraќačot.

Drug vazen čekor e da pronajdete iskusen transporten partner koj može da vi dade sovet, da ja pregleda dokumentacijata i da vi pomogne da izgotvite rentabilno rešenie za opasniot tovar.Prifatete ja pomošta od stručnite lica za da gi namalite transportnite trošoci a da ja zgolemite bezbednosta na opasniot Tovar vo vozdušniot transport.

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IZRABOTIL:

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Skopje 2021

AVTOSOOBRAĆAEN UČILIŠEN CENTAR
“Boro Petruševski” - Skopje

<u>Shipping and safety of hazardous materials by AIR</u>
ISPORAKA I BEZBEDNOST NA OPASNITE MATERII VO VOZDUšNIOT TRANSPORT
- seminarski trud -

Izrabotil:
M-r. Snežana Božinoska Risteska *dipl. soob. inž.*

Skopje 2021

APSTRAKT

This paper provides practical advice on dealing with hazardous materials that are transported by airborne vehicles. The paper contains a short history of air traffic and the beginnings of transporting hazardous materials with other traffic branches as a special review of air traffic. General information on hazardous materials, their classification, packaging groups and many useful tips for handling hazardous materials during air transport.

ITRODUCTION

Dangerous substances can be found everywhere. They can be found in almost every home and in most hospitals and factories. Dangerous materials are supplied at any time of the day, throught roads, railways and sea sometimes they are used to test the pipes (cathode protection).

If they expire, dangerous materials can cause problems in your area, environment, infrastructure and property. The potential for this to happen is that no matter how dangerous the materials are, they will be released accidentally, unintentionally, by accident or by any other weather conditions.

Incidents with dangerous substances affect everybody in the entire community. Workers in areas that regularly use or handle hazardous materials, oversized, first received and dispatched, all are exposed to hazardous health.

Regulators around the world use list created from United Nations to classify hazardous materials into nine categories: explosives, gases, flammable materials, flammable solid materials, oxidizers and radioactive materials, corossive matrials, infectious materials and others.

If you have a source of industrial chemicals, boxes with fireworks or bottles with oxygen, you already know that there is a risk of those dangerous items. Many products from every day usage, contain dangerous materials. For example, hair spray (aerosols, bottles, gas containers), waste disinfectants, oil-based paint (same heat absorber) or lithium-ion battery (which may burn) or explode. However, it is possible an object that stand on the shelf of your home for many years, when it comes time to put it on a plane, you need to know that it can couse danger.

Although many regulations for hazardous materials are the same for all transportation types, there are some significant differences for air transportation. For example, some dangerous products are not allowed on airplanes, although it is legal to transport them by boat or truck. Some dangerous products are allowed on aircraft with cargo site, but not on passenger aircraft. Cargo safety and preventing the transportation of undeclared dangerous goods is everyone's responsibility.

1. SHORT HISTORY OF AIR FREIGHT TRANSPORT

Air transportation is one of the most popular transportation options available. The history of air freight is relatively short when you consider sea freight. The movement of goods by sea can be traced back thousands of years. Air freight we only have to look to the last century.

The very first air freight shipment on a cargo-only plane took to the skies over a century ago in 1910. A US department store decided to fly 200Ibs of silk the 65 miles from Dayton to Columbus. The Model B plane, invented by the famous Wright Brothers, raced against an express train to see which was faster. The plane won and clearly demonstrated to the world that air freight could be a viable transport option air freight diversified in 1911.

Air mail demonstrations were held in both India and the UK. In the UK, a month-long airmail service ran as part of the Coronation celebrations for King George V. Moving mail by air the 21-mile distance from London to Windsor.

During the war effort there was considerable investment in aircraft technology. Planes were essential in transporting troops, Weapons and supplies over long distances.

At the end of the war the International Air Transport Association (IATA) was formed. This was also the period where All-Cargo airlines started to emerge. It was in 1968, some two decades later that the air-cargo industry had it's plane. The launch of the Boeing 747 could carry over 100 Tonnes of cargo on full aircraft pallets. Cargo versions had a nose-loading door which allowed larger cargo to be carried.

Fedex, DHL & UPS are names synonymous around the world with small parcels. Integrators whom carry small parcels on their own dedicated aircraft. Specialists in 32 Kilos or less in 2-3 days, not possible without all-cargo aircraft. With the rise of the internet and global players like Amazon / Alibaba and Ebay these small parcels continue to grow this market.

The history of air transportation in the 20th century, significantly changed. The internet has truly opened the world to a global market place. It has never been easier to import or export goods. Air freight offers a quick way to move goods from manufacture worldwide.

2. OPPORTUNITIES IN GLOBAL TRADE

- Aviation enables the free movement of people and goods around the globe.
- Aviation gives businesses the freedom to sell their goods in global markets. In 2019 aviation enabled more than 4.5 billion passenger journeys and transported over 61 million tonnes of cargo.
- Aviation liberates us from the constraints of geography, distance and time. In doing so, it enables us to lead better lives, and makes the world a better place.
- Aviation empowers us to explore the world, to do business globally, and to enrich our lives.
- Aviation reunites families and loved ones and creates opportunities for greater understanding among cultures
- Aviation connectivity gets goods to markets, and vital aid to those in need. By value, a third of the goods traded internationally travel by air.

Airlines transport over 52 million metric tons of goods a year, representing more than 35% of global trade by value but less than 1% of world trade by volume. That is equivalent to $6.8 trillion worth of goods annually, or $18.6 billion worth of goods every day.

Specialized freight forwarders for air can provide adequate cargo prices for professional work on this issue. The transport of heavy loads by sea, is an even cheaper option. Larger dimensions of the cargo in the cargo transport by sea are more likely to cause significant increase in the number of vessels, but the lack of

speed and the risk that we increase with this type of transport. Air transport in this pogled can offer a better offer.

3. CONTAINER TRANSPORT TEHNOLOGY FOR AIR TRANSPORTATION

In international freight transport air traffic still accounts for a small percentage of the great quantities of goods which are transported to different countries. At the same time, air transportation takes place in these goods that are stored in containers, as containerized goods. However, air container transport technology is present in certain cases where the flight for container transport takes place.

Accordin to this, the air transport technology of containers stands out as speciala technology. This technology is common when it comes to transport in containers for military needs, especially transport in non-accessible and difficult terrain.

The means by which this technology is realized are:

- cargo planes
- passenger planes (on the lower platform)
- high-capacity helicopters
- special types of helicopters

Cargo aircraft (known as freighter, freighter) or fixed cargo aircraft are designed only for cargo load. Such aircraft are usually not comfortable for passengers and usually have one or more doors for loading goods. Freight forwarders can be: civilian or cargo companies, private individuals or airforce in some countries.

Transportation of containers by aircraft is very important. Today, there are air transport of ISO standard containers that are transported by wide-body aircraft, but air transport is especially important when is realized with special aircraft containers (aircraft - module containers) which are constructed in such a way that they correspond to the body of the aircraft, and with that the step of using the loading space of the aircraft is increased.

Based on the fact air transport containers, then it is quite clear that the types of aircraft-module containers that are most used today as well as the aircraft with which they are transported are vital.

3.1 The most commonly used aircraft module containers

ULD – unit load device

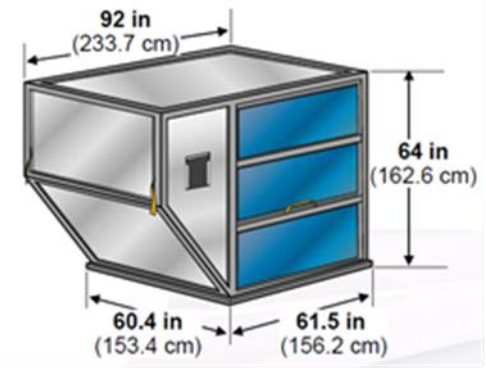
U	Non-Structural Container (Igloo)
L	Base - 1,534 mm × 3,175 mm
D	Strain - Main Deck, 2,438 mm × 2,997 mm

ULD comes in two forms: pallets and containers. ULD pallets are based on aluminum with designed vents to be attached to the joints for load nets. ULD containers, known as cans, are enclosed in aluminum

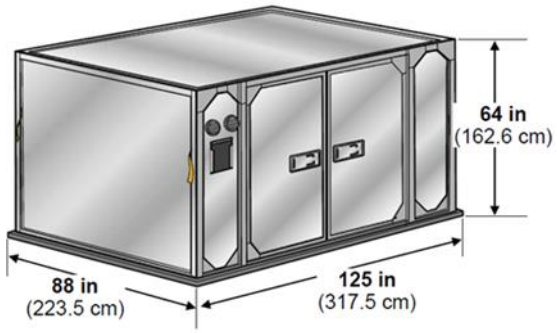
containers or a combination of aluminum (frame) and stainless steel, which, depending on the nature of the stock, need to be transported, and can be fitted.

Most used aircraft - container module in todays aircraft – transportation are:

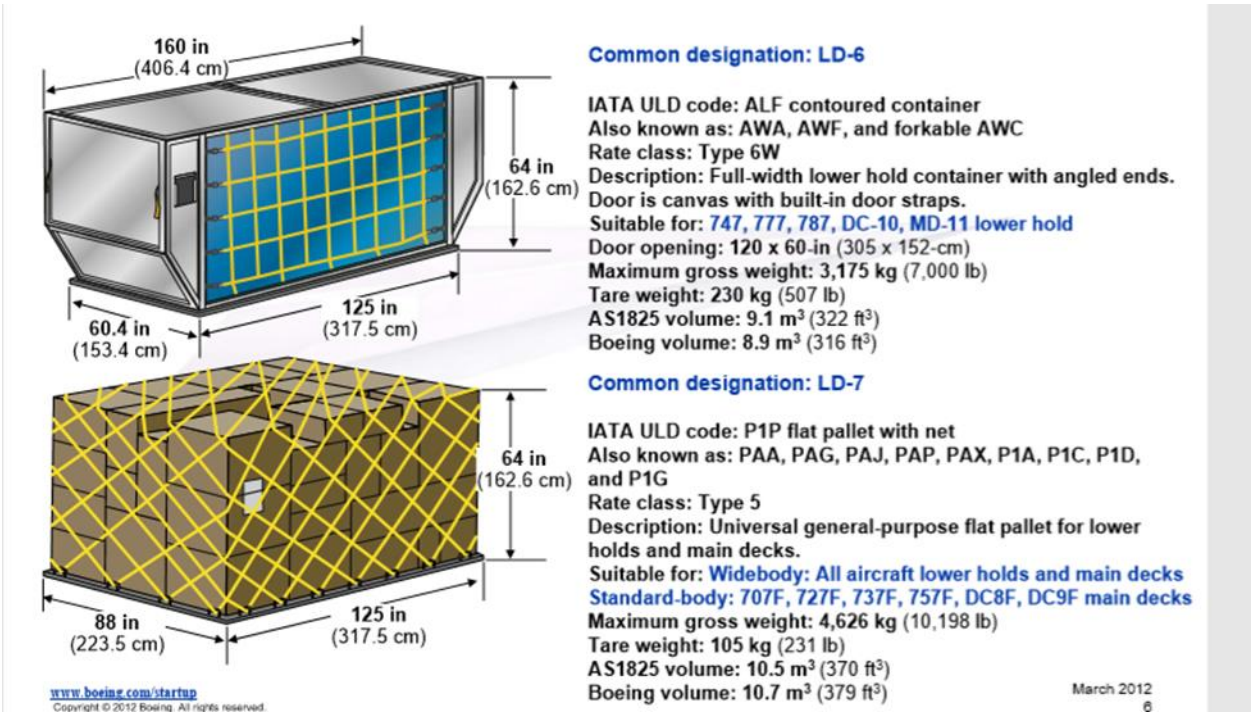
LD – 1, LD – 2, LD – 3, Insulated LD – 3, LD – 4, LD – 6, LD – 8, LD – 9, LD – 9 Reefer, LD – 11, A – 2, AQ – 6, AQ – 7, M – 6, LD – 26 и LD –29.



Pic.1. avio – modul conteiner LD-1

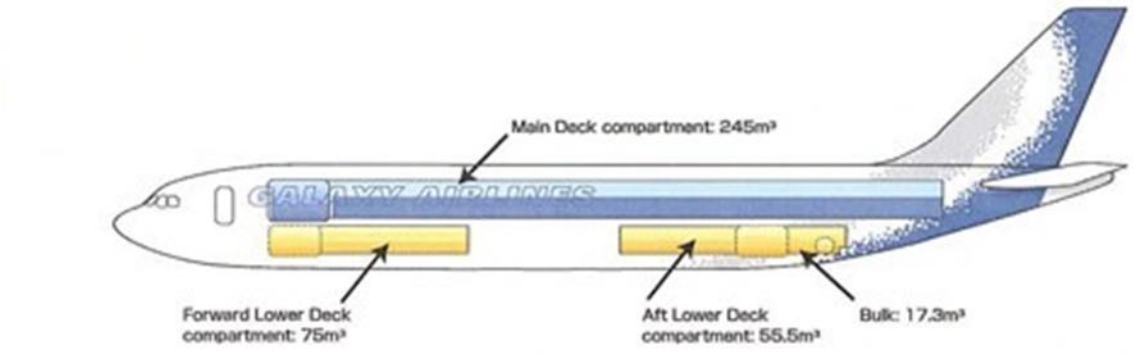


Pic.2. avio – modul conteiner LD-9



Pic.3. other avio – modul conteinesr LD-6, LD-7

Existing aircraft module containers that are most often used in air traffic may indicate the most commonly used aircraft for transporting aircraft module containers like: Boeing 747, Boeing 767 DC, McD Boeing 767 DC 10, McDonnell Douglas MD-11, Lockheed L1011, Airbus A300, Airbus A310, Airbus A330, as well as Airbus A340. No10 biggest cargo planes are: Antonov An-225 Mriya, Antonov An-124 Condor, Antonov An-22 , Aero Spacelines Super Guppy, Airbus A300-600ST Beluga, Airbus A400M Atlas, Lockheed C-5 Galaxy, Lockheed Martin C-130J Super Hercules.The most used aircraft in RS Macedonia are AN26 Antonov 26 which carries passengers and cargo and Boeing 737 which carries the same passengers and stock. DHL uses only cargo aircraft.



pic 4. Transport aircraft by location on cargo platforms

4. A BRIF OVERWIEV OF THE CRISIS WITH COVID-19 IN THE AVIATION INDUSTRY

From the beginning of the crisis with COVID-19, air freight and key partners in the delivery of needed medicines, medical equipment (including spare parts / delivery components) and in the field of global operations. This is specially planned operations with loads, utilization of cargo capacity in passenger aircraft and auxiliary flights to in the affected areas.

It was crucial to ensure a smooth delivery of the cargo. With the decline in demand and the cancellation of passenger flights, the vital capacity of air cargo has also disappeared. The airlines took all measures to meet the remaining demand for goods. Unfortunately, the airlines faced bottlenecks in obtaining appropriate permits and crew for cargo flights under quarantine conditions. The result has been delays in shipments when time is essential to fighting the COVID-19epidemic and maintaining global supply chains.

The challenges for the industry were clear. Comprehensive guidelines were provided that needed to be followed quickly to obtain work permits. Comprehensive guidelines were provided that needed to be followed quickly to obtain work permits. This confirms that the aircraft crew is able to work effectively in exceptional situations and quarantine.

pic 5. loading of a transport aircraft with the new COVID -19 measures

pic 6. HAZMAT on the plane

5. HISTORY OF TRANSPORT OF DANGEROUS GOODS

From the mid-1800s, the Earth struggled with hazards and difficulties in the transport of hazardous materials.

The regulation of the transport of dangerous goods started mostly without supervision and with great inconsistencies, which led to great catastrophes.

Since than, unified regulations have been introduced which significantly reduce the catastrophic impact of spill on people and the environment.

The most common regulations for the transport of dangerous goods are based on English rules and regulations, according to which "shipments are not intended to carry dangerous goods that can be shipped without the knowledge or agreement of the carrier". In 1871, the United States passed a federal law banning the transport of dangerous and perishable goods on passenger boats. In 1887, the International Trade Commission was formed, which established a unified regulatory agency for monitoring the transport of hazardous materials on railways, but in the next 40 years, all transporters were included like railway, water road and air.

The ICC has been and continues to be a transport oversight agency for more than 100 years establishing national standards for the packaging, labeling, charging and handling of explosives and other hazardous substances.

European training regulations and rules that need to be addressed in relation to hazardous materials as follows: Regulation (EU) no. 965/2012 on air operations, Annex III (Del ORO), Annex IV (del CAT), Annex V (Del SPA), Annex VI (NCC), Annex VII (NCO)

6. DELIVERY OF DANGEROUS GOODS BY AIR

The International shipments must comply with ICAO (International Civil Aviation Organization) technical guidelines as well as national regulations. In order to meet commercial standards, suppliers are required to comply with IATA (International Association for Air Transport) regulations for hazardous substances.
The rules are written by ICAO and are called technical guidelines for the safe transport of dangerous goods by air. IATA is an airline trade association that takes technical instructions and puts them in a format that is easy to use and understand. The IATA Hazardous Substances Regulations include all ICAO technical guidelines and some non-defined airline restrictions by ICAO. As IATA member airlines use IATA Hazardous Substances Regulations this should be in accordance with the sender.

Global supply of hazardous materials is certified by the International Air Transport Association (IATA) for the delivery of hazardous materials by air. If we do not accept
the rules and regulations for legal packing, obeljevanjeto and delivery of dangerous materials can result in loss of time first. IATA sets the global standard for safe transport of hazardous materials on air routes, and it is the only standard that currently recognizes airlines around the world.

7. GLOBAL REGULATIONS FOR DELIVERY AND SAFETY OF HAZARDOUS MATERIALS IN THE AIR

8. CLASSIFICATION OF HAZARDOUS MATERIALS

Class 1 Explosives
Class 2 Flammable & Non-Flammable Gases
Class 3 Flammable Liquids
Class 4 Flammable Solids
Class 5 Oxidizers & Organic Peroxide
Class 6 Toxic or Infectious Substances
Class 7 Radioactive Materials
Class 8 Corrosive Materials
Class 9 Miscellaneous

Dangerous substances are abbreviated as HAZMAT (hazardous materials) and include dry ice, explosives, flammable materials or materials, lithium batteries and chemicals. It cannot be said that all hazardous substances can be easy recognised or declared as such. There are many examples of common items that qualify as dangerous goods and people fail to recognize tham like: certain oils, varnishes and perfumes. Because those items are flammable, they need proper packaging for delivery.

It is commonly thought that hazardous materials are those sent from chemical companies, gas companies, pharmaceutical companies or research laboratories, but the truth is that any type of company

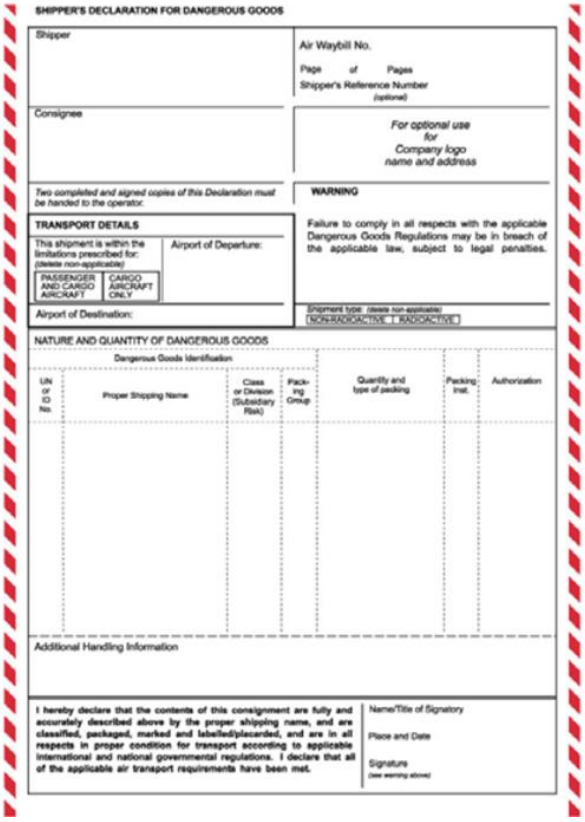
may need delivery of dangerous materials or dangerous goods at a given moment, including cosmetics, retail and food companies.

8.1 Documents required for the transfer of hazardous materials

Additional documents are required for delivery of hazardous materials. Some of these items include:

• Emergency telephone numbers;
• Registration information;
• Package group number;
• Regulations, special permits and contact numbers with institutions.
* Note - In the aviation industry the term Dangerous materials is used synonymously with the term Hazardous materijal.

- Trade documents;
- UN, PSN (proper shipping name), PG;
- Emergency telephone numbers;
- Recorded evidence.


SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper

Air Waybill No.

Page of Pages

Shipper's Reference Number (optional)

Consignee

For optional use for Company logo name and address

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT | CARGO AIRCRAFT ONLY

Airport of Departure:

Airport of Destination:

Shipment type: (delete non-applicable) NON-RADIOACTIVE | RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Packing Group	Quantity and type of packing	Packing Inst.	Authorization

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.

Name/Title of Signatory

Place and Date

Signature (see warning above)

Fig.7. Aviation declaration with red-white edge

8.2 Hazardous materials must be classified for transport

For easier determination when a substance is dangerous for transport, we use 9 different classes of danger. Each of these classes has its own technical and scientific criteria.
During the investigation or inspection of the transport of dangerous goods, the most frequent deficiencies occur in:

• Classification;
• Delivery documents;
• The packaging;
• Personal training.

A list of security data such as:
• Name of the dellivery
• Danger class
• Packing group
• UN number

9. PACKAGING OF DANGEROUS GOODS

Air cargoes that contain dangerous goods must be properly packed in accordance with international standards. Some used materials for packing hazardous materials include steel baskets, plastic bottles and boxes made of special varnish.
OON sets standards for the following packing groups:
• Packing group I - Great danger: Necessary and best protected packing and goods from this category can not be sent to the same container or aircraft with other materials from the same group.

• Packing group II - medium danger.
• Packing group III - small danger. It is necessary to have a large number of protective packaging.

When packing the hazardous materials, care should be taken not to exceed the limit on the quantity of the packaging, including the inner packing, the instructions for closing the various, solid or heavy materials, such as the type of packaging.

9.1 Procedure for packing hazardous materials

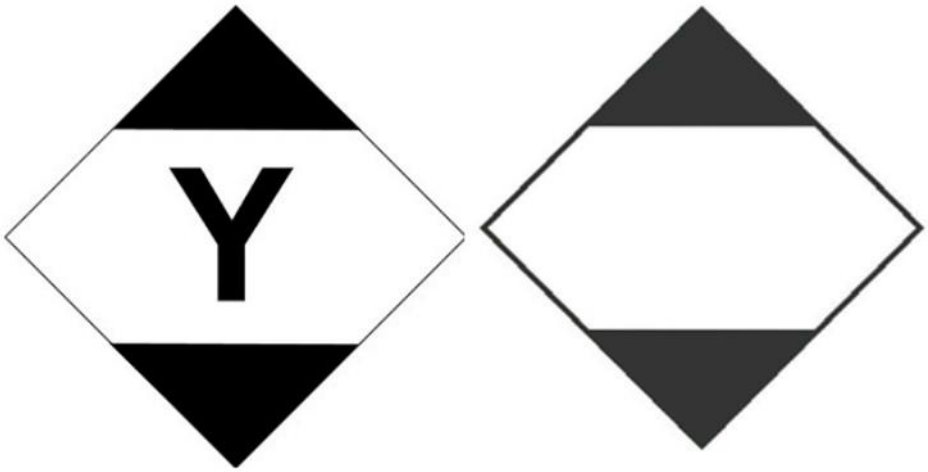


Fig.8. Mark for limited quantities of shipments by air

Aviation safety depends on the delivery of hazardous materials in proper packaging. If you choose the wrong package, you can seriously avoid the carrier, not to mention the living environment or to cause catastrophic damage to the aircraft.

Consumer protection of hazardous materials is based on the most appropriate classification of the hazard of the product and its negative physical characteristics. For example, you can not use corrosive materials in metal packaging because corrosive materials react strongly with the metal and eventually break the packaging.

The requirements for packaging vary depending on the type, class and quantity of the hazardous material being transported. Often, the package must be tested and certified to meet the requirements for delivery of hazardous materials on air. 49 CFR, Section 173 lists the general requirements for packaging applied to large and non-large packaging, new and reused packaging and specification and non-specification of packaging.

The appropriate packaging depends on the material packaging group. The group of inequalities and the group of substances (except those in Class 2, Class 6. 2 and Class 7), in agreement with the degree of danger they present:

• Packing group I: substances that present a great danger;
• Packing group II: substances that present a medium danger; and
• Packing group III: substances with little danger.

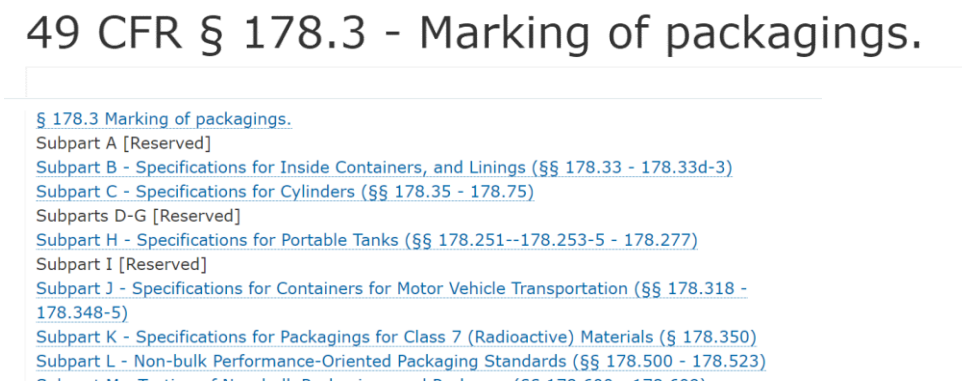
Suitable packaging according to OON specifications, or performance oriented packaging (POP), for more air handling with hazardous materials. POP is a package that must pass several tests to prove that the packages are strong enough to withstand shocks, loads and changes in atmospheric pressure that usually occur during transportation.

Packages that have successfully passed these tests bear the OON mark to confirm that they have completed the required tests. Labels indicate the level of testing that the packaging has withstood.

You can see the *table with ID on the packages* to help you verify the correct identification of the package. (Guidelines for All Performance-Oriented Packaging Standards and Tests can be found in the *Federal Regulatory Code, Title 49, Section 178.)*

These are the procedures for determining whether the packages are sufficient for use:

1. Compare the Reference Name (PSN) in the hazardous materials table (HMT) at 49 CFR or the hazardous materials in ICAO TI.
2. Find and follow the relevant information and packing instructions in column 8 of HMT or column 10 of TI.
3. Make sure the packages are properly marked.
4. Confirm that the package is PG compliant marked in HMT.
5. Confirm that Column 7 "*Special Detail Codes*" or Column 9 "*Purchase Orders*" does not further restrict the package.



https://www.law.cornell.edu/cfr/text/49/178.3

9.2 Types of packaging

Following to separation rules - must make sure that you do not pack hazardous materials with incompatible hazardous materials, which may react dangerously with other hazardous materials.

• Carefully follow the information in the package closure instructions. The manufacturers of the packages test the packages with the specifications of the OON with the materials contained in the closure instructions. A change from the manufacturer's instructions for closure may endanger the integrity of the package and result in non-compliance.

• Make sure that the complete package does not exceed the test weight per kilogram (in kilograms).

UN1A2 / Y23 / S / 93 / SAD / + AA1234

Test group UN1A2 and max. gross mass (kg) »Y23

9.3 Where can you get proper packaging for hazardous materials?

It is possible to buy packaging for the delivery of hazardous materials by air, through various commercial sources. Since the FAA is a government entity, it cannot approve or recommend a specific source for packaging supply that meets regulatory requirements for materials. However, sellers are easily accessible on the Internet.

Sample UN Markings

Markings for SOLIDS:

UN Code for Fiberboard Box (4G) and Variable inner-container material and configuration (V) » **4GV**

Solids or inner Packagings » **S**

State/country authorizing mark » **USA**

u
n **4GV/X13/S/08/USA/+AQ2121**

United Nations Packaging Symbol » **UN**

Packing Group tested and max. gross mass (kg) » **X13**

Last two digits of the year of manufacture » **08**
Manufacturer certifying package » **AQ2121**

Markings for LIQUIDS:

Type of Package » **1**
Category » **1**
Maximum Gross Mass Or Specific Gravity » **1.5**
Year of Manufacture » **12**
Manufacturer Certifying Code » **M4071**

u

n 1A1/X1.5/250/12/USA/M4071

Materials » **A**
Packaging Group » **X**
Hydrostatic Test Pressure
Or "S" for Solid » **250**
Country of
Manufacture

9.4 Some useful advices for employees who participate in all phases as well as in the transport of hazardous materials

Before offering a dangerous good to an air carrier for shipment, the Hazardous Materials Regulations require YOU, the shipper, to properly classify, package, mark and label the package to identify the hazard.

When shipping dangerous goods (e.g., lithium batteries or battery powered devices, aerosols, oxygen cylinders) or flammable liquids (e.g., perfumery products or alcoholic beverages) please follow these steps to ensure your package is correctly packed and marked:

Step 1: The Safety Data Sheet (SDS) is a good starting point for determining if an item you are shipping might be a dangerous good. Typically, you can obtain an SDS from the manufacturer of the products that you plan to ship by air, and check the transportation information section. Pay particular attention to the specific information that pertains to shipments by air.
•A hazardous material or dangerous good is defined as a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 Code of Federal Regualtions (CFR) § 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of [the Hazardous Materials Regulations].

Step 2: If you determine that an item is a dangerous good, the FAA recommends that you perform a needs assessment analysis to determine which employees at your company will be performing a hazmat function and identify the level of training that is needed by the regulations.

Step 3: For most employees, training will include general and security awareness, safety, and function-specific training. Under the 49 CFR, a hazmat employee is required receive recurrent training every three years.
•The lCAO Technical Instructions provide that the recurrent hazardous materials training requirements prescribed in Part L, Chapter 4, Section 4.2.3, "must take place within 24 months of previous training to ensure knowledge is current."
•Hazmat employee is a person employed by a hazmat employer, or person who is self-employed, and who directly affects hazmat transportation safety including a person who: ◦loads, unloads, or handles hazardous materials or dangerous goods;

◦designs, manufactures, fabricates, inspects, tests, reconditions, repairs, modifies, marks, or otherwise represents packagings as qualified for use in the transportation of hazardous materials or dangerous goods;
◦prepares hazardous materials or dangerous goods for transportation;
◦is responsible for safety of transporting hazardous materials or dangerous goods; or
◦operates a vehicle used to transport hazardous materials or dangerous goods.

Step 4: Have a trained employee look up the material in the Hazardous Materials Table to determine the authorized quantities permitted to be shipped, labels required, and the allowable packaging as per the 49 CFR Part 173 and the packing group.

Step 5: Determine the quantities and corresponding packaging requirements for your shipments. Depending on the packing group assigned to the hazardous material, UN-Specification packaging may be required.
•The Packing Group is a grouping according to the degree of danger presented by hazardous materials or dangerous goods. The performance level identifies the performance standard to successful testing of the packaging: ◦X – For packaging meeting Packing Group I, II and III test. (Packing Group I – Great Danger)
◦Y – For packaging meeting Packing Group II and III test. (Packing Group II – Medium Danger)
◦Z – For packaging meeting Packing Group III test. (Packing Group III – Minor Danger)

Step 6: If UN-Specification packaging (PDF) is required, read the package closure instructions carefully and obtain all the materials listed in instructions, such as tape, zip ties, poly bags, etc. Be sure to follow the information closely. Packages meeting UN specifications are tested with the materials listed in the closure instructions. Any variation from the manufacturer's instructions is a violation and could compromise the integrity of the package.

Step 7: Once you have the proper packaging, obtain the appropriate hazard communication, i.e., markings, labels, and shipping paper/shippers declaration. Generally, the Proper Shipping Name, the UN Number, and the shipper or consignees name and address are required to be marked on the package on the same surface as the label.

Step 8: Mark and label the package.

Step 9: If you are using a combination package, place the material in its inner packaging in accordance with the closure instructions. Then place the inner packaging in its authorized outer packaging and seal the package in accordance with the package closure instructions.

Step 10: Fill out the shipping paper and affix it to the outside of the package in an unobstructed area. For example, shipper's declaration for infectious substances (PDF).

Step 11: Your package is ready to be shipped.

Step 12: Keep the Shipper's Declaration on file for a period of two years.

9.5 Reporting an accident with dangerous materials

Regulations for hazardous materials require you to report certain types of hazardous materials or accidents with hazardous materials. Accident reporting is vital to traffic safety concerns. Reporting data

enables regulatory organizations to identify trends and new security risks, assist in identifying risk-based priorities and resources, and identify persistent shippers of undeclared dangerous goods.

9.5.1 Immediate reporting of certain hazardous materials or accidents with hazardous materials

You are required to submit a notification (within 12 hours) to the National Center responsible for hazardous materials when any of the following accidents occur during transport, loading, unloading and temporary storage:

- one person lost his life;
- One person is admitted to the hospital;
- The general public is evacuated for more than 1 hour;
- Large transport artery or object disconnected or closed for more than one hour;
- The operating flight of the aircraft was changed;
- Radioactive contamination occurs;
- Suspicious contamination from infectious substance (yellow regulated medical waste) occurs;
- If a marine pollutant above 450 L (119 liters) for liquids or 400 kg (882 lbs) for solids appears;
- Battery or battery charge ignited violently or there is an explosion or dangerous heat rise during air transport.

10. INFORMATION FOR PREPARATION OF DETAILED REPORT ON ACCIDENTS WITH DANGEROUS MATERIALS

Submit a written report to the Office for Safety of Dangerous Substances within 30 days during the following accidents:

- If any of the circumstances arise, for which immediate notice is required;
- Unintentional release of dangerous waste in any car;
- When the special cargo tank with a capacity of> 1000 liters is structurally damaged;
- Undeclared dangerous transport material was detected during the transport;
- Battery or battery charger is leaking, there is a burst, there is an explosion or it is exposed to heat during transport times.

Hazardous substances such as (primer, batteries, electronics, dry ice, aerosols, consumer goods, flammable liquid, etc.) Shipped as cargo not properly identified (ie marked, etc.) "Dangerous substances.

Submit a report to PHMSA via the Internet or submit a written report on the accident with dangerous substances to the Ministry of Transport and Communications.

You are required to submit a copy of the Dangerous Goods Accident Report to the FAA if the accident occurred during airlift.

Reports@faa.gov.

10.1 The reports should contain the following information

- **Information on the type of accident** (rear end, side overturning, collision and cancellation of vehicles) and consequences of the accident (eksplozija, požar, spill and non-spill).
- Previous studies have divided the severity **of injuries into 5 categories**; the severity of the accident is considered according to whether there is an injury, no injury, severe injury or death.
- **The category and quantity** of hazardous material transported.
- **Driver`s information** (driver characteristics, age and behavior.)
- **Location information** such as: condition of the area where the accident occurred and location of the accident; Last registered location according to radar control, near some places, road, highway, crossroads, token coordinates
- **The information about the aircraft** is: the type and number of aircraftsand vehicles involved in the accident.
- **Information about the circumstances** are the time frame of the accident (hour, day, month), visibility (dawn: from 5:00 to 6:59 нayasot in the morning, day: from 7:00 to 16:59 otasot, twilight: from 5: 00 to 6:59 иasot afternoon and dark: from 19:00 to 4:59 časot nautro) and weather conditions (sunny cloudy rain, snow and fog).

11. RECEIVING OF HAZARDOUS MATERIES

When you are taking dangerous substances, always follow these steps before signing up for them:
• confirm that you are qualified to receive the package.
• If you have not completed the order or you have not been given prior authorization to accept the shipment, do not accept and do not sign the package.
• Inspect the outside of all packages.
• If any physical damage is observed; leaks, drops, leaks, discoloration or discoloration, do not accept the package.
• If the packaging produces a strong odor, contact a professional for further action.
• If the contents are unstable or broken during handling, do not accept the package.
• Examine the delivery documents to make sure the items in the shipment are described
• If the items do not match the description, do not accept the package.

If any discrepancies or damage are observed and the sender refuses to return the package, has left the premises or is unavailable, contact EHS (environment, health & safety) immediately.
Once the package has been inspected and accepted, immediately secure it, store it properly to prevent theft, loss or damage. Do not leave the package unsafe.

Do not handle any contents containing dangerous substances, unless you are properly trained in the dangers that can be present and how to protect your health and safety. If you find a damaged, leaking or hazardous container after receiving the package, immediately contact the police near you and inform them of your location and situation. Leave the shipment in a safe place, if you have access to the aspirate, put the

package inside and close it and do not try any other activities until the EHS has made an assessment of the situation.

CONCLUSION

If shipments of dangerous goods are incorrectly classified, incorrectly labeled or incorrectly packaged, the worst thing that can happen to you is really bad. Improper packaging can increase the risk of the product exploding, igniting, releasing toxic gas, or causing other hazards during the flight, which can lead to disaster. An incorrect declaration or label may leave persons in direct contact with hazardous substances without the necessary information in the event of an accident.
In the best case, when the airline discovers the mistake, it can reject the shipment. But then time and money are spent to correct the mistake. If, for example, the package load is incorrectly marked, then it will have to be transferred on a pallet in a facility where the service provider has to inspect and mark each box. Then this load should be reserved and reloaded on another flight.
Fees for dangerous shipments in air transport are really higher than for ordinary cargo. The additional cost for the mistake made will not be emphasized as a cost, but the airline will charge more per kilogram than it would pay for non-hazardous goods.

For sending cargo that is not allowed to fly on a passenger plane, you pay much more, because the charges for transporting cargo by plane are always higher.

When planning to send hazardous cargo by air, the first and most common step is to hire a professional for hazardous materials or to hire someone from the staff to take on that role. No one - no supplier, no logistics company, no airline staff - can not take responsibility for the sender.
Another important step is to find an experienced transport partner who can give you advice, review the documentation and help you prepare a cost-effective solution to the dangerous load.

LITERATURE

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D0%BE%D1%82_%D0%BF%D0%B0%D1%82%D0%B5%D0%BD_%D1%81%D0%BE%D0%BE%D0%B1%D1%80%D0%B0%D1%9C_%D0%B0%D1%98_ADR

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J.U. SREDNJA ŠKOLA ZA SAOBRAĆAJ I KOMUNIKACIJE SARAJEVO

Doc.dr.sc. Kemal Jaganjac

OCJENA KVALITETA ZRAKA I NIVO BUKE U ULICI BOSANSKA – OPĆINA TRAVNIK – U CILJU UREĐENJA ISTE KAO PJEŠAČKE ZONE

SAŽETAK

Današnji način života u urbanim sredinama, usljed porasta broja motornih vozila i njihovog doprinosa u narušavanju kvaliteta zraka, usljed emisije štetnih sastojaka produkata sagorijevanja kao i emisije neprimjerenih nivo buke, štetnih za zdravlje ljudi, nameće potrebu da se u određenim zonama grada, ili samo nekim ulicima ili njihovim pojedinim dijelovima, uvedu pješake zone. Ovakve pješačke zone predviđaju zabranu kretanja motornih vozila u cijelosti ili dijelu ulice osim vozila za snabdijevanje i komunalnih vozila u određenim vremenskim periodima tokom dana, kada je intezitet pješačkog saobraćaja smanjen. Sa ovim ciljem, općina Travnik je krajem 2020. godine pokrenula inicijativu za izradom studije pod nazivom „Studija opravdanosti uređenja Bosanske ulice kao pješačke zone u Travniku“ i ovaj zadatak povjerila saobraćajnom fakultetu Internacionalnog univerziteta Travnik u Travniku. Ovaj rad, pod nazivom „Ocjena kvaliteta zraka i nivo buke u ulici Bosanska, općina Travnik, u cilju uređenja iste kao pješačke zone“ je sastavni dio te studije. Zaključci koji su dobijeni nakon istraživanja kvaliteta zraka i nivoa buke u ulici Bosanska, zajedno sa drugim zaključcima koji su dati u studiji iz oblasti saobraćajnih tokova, sigurnosti saobraćaja, stacionarnog saobraćaja, potreba građana, potreba privrednih sudjekata itd., kao i predložena varijantna rješenja, pomoći će i poslužiti nadležnim u općini Travnik da donesu odluke u cilju potpunog zatvaranja, zatvaranja samo jednog dijela ili zatvranja u određenom intervalu u toku dana za motorni saobraćaj i pretvaranja te ulice ili njenog dijela u pješačku zonu.

Ključne riječi: **kvalitet zraka, emisija buke, motorni saobraćaj, studija, pješačka zona**

1. UVOD

Problem korištenja energije i zaštite životne sredine su sigurno u vrhu aktuelnih svjetskih problema. Ogromne količine oslobođenog ugljen-dioksida (CO_2) izazivaju efekat stakleničke bašte, nastajanje kiselih kiša, oštećenja gornjih slojeva atmosfere i druge posljedice. Sve to dovodi do postepenog globalnog zagrijavanja planete Zemlje. Također, buka koja nastaje od kretanja motornih vozila ima štetni uticaj na zdravlje ljudi.

Kao glavni zagađivači zraka u Bosni i Hercegovini definisana su ložišta na čvrsta i tečna goriva (uglja, mazuta, peleta i druga ekološki nečista goriva) koja se koriste za zagrijavenje kolektivnih i individualnih objekta. Među važnije zagađivače zraka smatraju se i cestovna motorna vozila. Cestovni motorni saobraćaj, koji koristi motore sa unutrašnjim sagorijevanjem na konvenciona goriva (motore SUS), među najvećim je izvorima zagađenja zraka. Procjene su da je u atmosferi u urbanim sredinama 91,0 (%) ugljen monoksida, 56,0 (%) azotnih oksida, 50,0 (%) ugljovodonika i 10,0 (%) ostalih čestica koje potiču od saobraćaja, odnosno od sagorjevanja fosilnog pogonskog goriva u motorima SUS. Glavni zagađivači zraka, koji se emisijom sagorjelih gasova ispuštaju iz motornih vozila su: ugljenmonoksid (CO), ugljendioksid (CO_2), ugljovodonici (C_XH_Y), azotni oksidi (NO_X), čađ, sumpordioksid (SO_2), itd. Također, motori sa unutrašnjim sagorijevanjem ispuštaju u zrak nekoliko itekako otrovnih elemenata kao što su: olovo, fermaldehid i benzol i čije su emisije povezane sa kvaltetom goriva i njihovih aditiva.

Buka koja potiče od vozila cestovnog saobraćaja je vrsta buke koja je najviše rasprostranjena i predstavlja u urbanim sredinam ozbiljan društveni problem. Kod analize buke, nastale od cestovnih motornih vozila, treba poći od analize karakteristika autobusa, teških teretnih vozila, individualnih odnosno putničkih automobila, motocikala pa ići prema analizi buke nastale usljed karakteristika saobraćajnog toka, naročito u urbanim sredinama, gdje se javljaju neprekinuti i prekinuti tokovi saobraćaja.

Problem kvalteta znaka i emisije prekomjenih nivo buke, kao i ostale probleme nastale kretanjem motornih vozila u urbanim sredinama, prepoznali su i nadležni u općini Travnik. S tim u vezi, krajem 2020. godine, pokrenuli su postupak izrade studije „Studija opravdanosti uređenja Bosanske ulice kao pješake zone u Travniku“. Izradu Studiju povjerili su Saobraćajnom Fakultetu, koji egzistira u okviru Internacionalnog univerziteta Travnik u Travniku. Segment studije, koji se odnosi na ocjenu kvaliteta zraka i nivo buke, u zoni ulice Bosanska, pripao je meni. Istraživanja su vršena od janura do maja 2020. godine. U nastavku rada biti će predstavljeni načini prikupljana podataka, analiza istih i prijedlog rješenja u vezi sa ovim segmentom a koji je bio jedan dio istraživanja u vezi donošenja zaključaka i varijantnih rješanja. Istraživanja su vršena i u segmentima saobraćajnih tokova, sigurnosti saobraćaja, stacionarnog saobraćaja, potreba građana, privrednih subjekata itd.

2. PRIKUPLJANJE I ANALIZA PODATKA

2.1. Prikupljanje i analiza podata o kvalitetu zraka

Na osnovu posljednih podataka za 2020. godinu na području Općine Travnik ima 12.635 registrovanih motornih vozila. Struktura registrovanih vozila je sljedeća: motorna vozila - 11.535, teretna vozila – 804, motocikli – 92 i autobusi – 104.

Da bi građani imali što jasnije sliku o stanju kvaliteta zraka, posljedicama koje mogu nastati po zdravlje, bilo da se radi i o kratkotrajnom izlaganju zagađenom zraku, kao i da se upoznaju sa načinima kako da se zaštite tokom trajanja epizoda povećanog zagađenja, kvalitet zraka može se predstaviti Indeksom kvaliteta zraka (Agencija za zaštitu okoliša SAD - US EPA Air Quality Index). Vrijednost indeksa kvaliteta zraka direktno nam ukazuje na stepen zagađenosti zraka i moguće zdravstvene probleme koje građani mogu osjetiti nekoliko sati ili nekoliko dana nakon izlaganja zagađenom zraku.

Na Mjernim stanicama u BiH mjere se prosječne satne koncentracije sljedećih polutanata: prizemnog ozona – O_3, lebdećih čestica – $PM_{2.5}$ i PM_{10}, sumpor dioksida – SO_2, azotnih oksida – NO_X i ugljen monoksida CO. Najveću prijetnju po zdravlje stanovnika zagađenih gradova u BiH predstavljaju povišene koncentracije lebdećih čestica i sumpor dioksida. Veća indeksna vrijednost znači zagađeniji zrak i ozbiljnije eventualne posljedice po zdravlje. Na primjer, 50 indeksnih poena znači relativno čist zrak i malu vjerovatnoću štete po zdravlje, dok indeksna vrijednost od preko 300 poena znači zagađenje visokog nivoa, izuzetno opasnog po zdravlje svih građana. Vrijednosti Indeksa veće od 100 izražavaju kvalitet zraka opasan prije svega za skupine stanovništva izuzetno osjetljive na zagađenje, a krajnje povećanje indeksne vrijednosti znači zrak opasan za sve. Svakog sata preuzimaju se podaci sa postojećih zvaničnih, automatskih mjernih stanica nadležnih bh. institucija koje svoje podatke objavljuju na internetu.

Za potrebe Studije o opravdanosti inicijative uređenja Bosanske ulice kao pješačke zone, praćeni su podaci o vrijednostima kvaliteta zraka putem automatskih mjernih stanica u periodu 05.02.-05.03.2021. godine.

Analizirajući vrijednosti elemenata kvaliteta zraka u periodu 05.02.-05.03.20201. godine može se konstatovati sljedeće za posmatrani period:

- vrijednosti **Indeksa kvaliteta zraka** kreću u granicama od 42 do 153 poena. Ovakav kvalitet zraka karakteriše se od zadovoljavajućeg do vema nezdravog, s tim da je veći broj dana u analiziranom periodu Indeks kvaliteta zraka bio nezdrav,
- koncentracija **prizemnog ozona – O_3** kretala u vrijednosti od 42 do 153 ($\mu g/m^3$). Ovakava koncentracija prizemnog ozona – O_3 karakteriše se od zadovoljavajućeg do veoma nezdravog, s tim da je veći broj dana u analiziranom periodu koncentracija bila nezdrava,
- koncentracija **lebdećih čestica – $PM_{2,5}$** kretala u vrijednosti od 13 do 107 ($\mu g/m^3$). Ovakava koncentracija lebdećih čestica – $PM_{2,5}$ karakteriše se od odličnog do nezdravog, s tim da je veći broj dana u analiziranom periodu koncentracija bila nepovoljna.
- koncentracija **lebdećih čestica – PM_{10}** kretala u vrijednosti od 11 do 72 ($\mu g/m^3$). Ovakava koncentracija lebdećih čestica – PM_{10} karakteriše se od odličnog do nepovoljnog, s tim da je veći broj dana u analiziranom periodu koncentracija bila nepovoljna.
- koncentracija **azotnog dioksida – NO_2** kretala u vrijednosti od 2 do 41 ($\mu g/m^3$). Ovakava koncentracija azotnog oksida – NO_2 karakteriše se od odličnog do zadovoljavajućeg, s tim da je veći broj dana u analiziranom periodu koncentracija bila zadovoljavajuća.
- koncentracija **sumpor dioksida – SO_2** kretala u vrijednosti od 1 do 12 ($\mu g/m^3$). Ovakava koncentracija sumpor dioksida – SO_2 karakteriše se kao odlična i imala je tu karakteristiku tokom cijelog vremenskog perioda posmatranja.
- koncentracija **ugljen monoksida – CO** imala vrijednosti 1 ($\mu g/m^3$). Ovakava koncentracija ugljen monoksida – CO karakteriše se kao odlična i imala je tu karakteristiku tokom cijelog vremenskog perioda posmatranja.

2.2.Prikupljanje i analiza podata o nivou buke

Pod pojmom buke, nastale od kretanja vozila, ranije se smatrala samo buka nastala od rada pogonskog motora, tj. njegovog ispušnog sistema. Danas je jasno da su, osim buke nastale od rada pogonskog motora, prisutni i drugi izvori buke koje emituju vozila, koji po svojoj važnosti nisu ništa manje važni od buke koju proizvode motori SUS. Ovi izvori buke posebno se uočavaju pri velikim brzinama kretanja vozila. Tu treba navesti: transmisiju, buku pneumatika usljed kotrljanja, buku strujnih površina vozila i buku dijelova nadgradnje (do koje dolazi pod uticajem rezonansi).

Nivo buke je također funkcija brzine kretanja vozila, gdje je uključen i odnos pnemuatika i površine kolovoza. Što se vozilo kreće većom brzinom nastaje veći nivo buke kao posljedica odupiranja pneumatika o gazeći sloj kolovoza. Kritična granica brzine kretanja za teška vozila se kreće pri vrijednosti od oko 50,0 (km/h). Ako su brzine kretanja iznad 50,0 (km/h) dolazi do izraženije buke nastala usljed dodira pneumatika sa površinom kolovoza. Ako je brzina kretanja motornog vozila manja od 50,0 (km/h) dominintni su izvori buke sa pogonskog motora. Prilikom analize i proračuna vrijednosti nivoa buke koja zavisi od brzine kretanja vozila moraju se uzeti u obzir i vrijednosti veličina kao što su širina gazećeg sloja pneumatika, uslovi koji vladaju na cesti, ravnost gornje površine ceste i dr.

Uticaj buka na čovjeka ima za posljedice psihičke i fizičke poremećaje. Ometa mu neophodni odmor, san i koncentraciju, smanjuje mu produktivnost i efikasnost rada, mogu nastati promjene krvnog pritiska i pulsa, promjene i poremećaju u radu probavnih organa, suženja vidnog polja, te može doći do trajnog oštetećenja sluha. Iz razloga što buka ima štetno dejstvo na organizam čovjeka donošenje i provođenje propisa o zaštite od buke, u zemljama u okruženju je u nadležnosti Ministarstva zdravstva. Kod nas je donesen Zakon o zaštiti od buke na nivo Federacije BiH.

Za potrebe ove Studije vršeno je mjerenja na tri mjerna mjesta duž gradske saobraćajnice, Bosanske ulice, koja su pruža kroz središnji dio urbanog područja grada Travnika.

Mjerenje nivoa buke vršeno je na sljedećim mjernim mjestima:

1. Mjerno mjesto 1 – MM1 – Bosanska ulica, Lokacija: Trg Grada Lajpciga;
2. Mjerno mjesto 2 – MM2 – Bosanska ulica, Lokacija: Ulaz na Zelenu pijacu sa Bosanske ulice;
3. Mjerno mjesto 3 – MM3 – Bosanska ulica, Lokacija Bosanska ulica br. 161.

Mjerenja su vršena sa sljedećom mjernom opremom: **Fonometar (**Proizvođač: Brüel&Kjær; Tip: Integrating Sound Level Meter Type 2239; Tvornički broj: 2358899), **Mikrofon** (Proizvođač: Brüel&Kjær; Tip: 4188; Tvornički broj: 2346370), **Kalibrator** (Proizvođač: Brüel&Kjær; Tip: 4231; Tvornički broj: 2637563), **Predpojačivač** (Proizvođač: Brüel&Kjær ; Tip: ZC 0032; Tvornički broj: 14108).

Mjerna oprema iznajmljena je od Minsitarstva unutrašnjih poslova Kantona Sarajevo, Sektora uniformisane policije, Jedinice za saobraćaj. Mjerenje inteziteta ukupnog petnaestominutnog ekvivalentnog nivoa buke, izvršeno je na definiranim mjernim mjestima (MM1, MM2 i MM3), a normiranje izvršeno u skladu sa Zakonom o zaštite od buke ("Službene novine FBiH" broj 110/12);

Neposredno prije početka i nakon svakog obavljenog mjerenja vrijednosti nivoa buke, vršena je kalibracija mjernog uređaja. Kalibracija će vršiti pomoću Kalibratora (Proizvođač: Brüel&Kjær, Tip: 4231, Tvornički broj: 2637563).

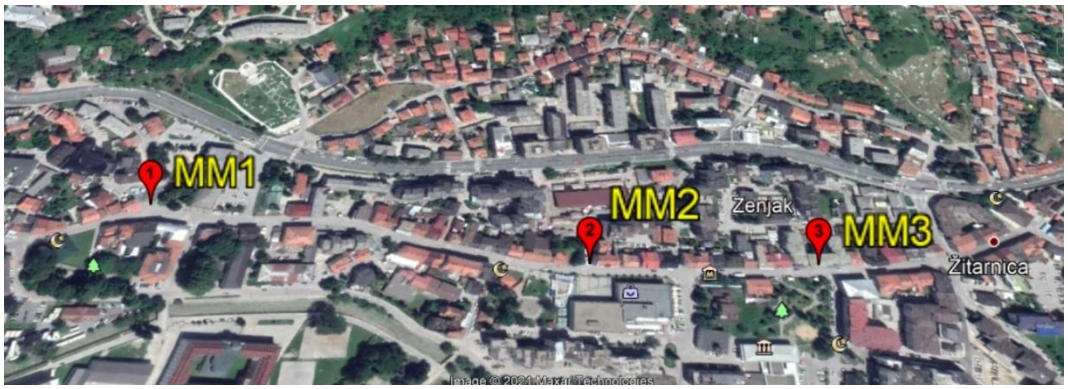
Mjerenja su izvođenja u tri perioda, u toku 24 sata, i to u dnevnom periodu I u vremenskim intervalima: 07:00-07:30, 08:00-08:30, 09:00-09:30 i 10:00-10:30 sati, u dnevnom periodu II u vremenskim intervalima: 13:00-13:30, 14:00-14:30, 15:00-15:30 i 15:30-16:00 sati kao i u večernjem periodu u vremenskim intervalima 16:00-16:30, 16:30-17:00, 17:00-17:30 i 17:30-18:00 sati. U naznačenim vremenskim intevalima od po 30 minuta mjerenje su vršena u neprekidnom vremenskom periodu od 15 minuta. Također, potrebno je napomenuti da nije bilo moguće izvršiti noćno mjerenje koje se standardno vrši u vremenskom intervalu od 22:00 do 06:00 sati iz dvojakog razloga. Prvi je taj što je Bosanska ulica zatvorena za motorni saobraćaj u vremenskom periodu od 18:00 do 24:00 sati, svakim radnim danom i subotom a nedjeljom od 00:00 do 24:00 sati. Drugi razlog je taj što je u vrijeme izrade Studije o opravdanosti inicijative uređenja Bosanske ulice kao pješačke zone bila na snazi mjera Federalnog kriznog štaba ograničenja kretanja u vremenu od 23:00 do 05:00 sati.

Mjerenja su izvršena 16. i 17. februara 2021. godine po sljedećoj dinamici:

- 16.02.2021.godine (utorak) – Mjereno mjesto 1 – MM1 – Bosanska ulica -Lokacija Trag Grada Lapciga – dnevno mjerenje I od 07:00 do 10:30 sati;
- 16.02.2021.godine (utorak) – Mjereno mjesto 2 – MM2 – Bosanska ulica - Lokacija Ulaz na Zelenu pijacu sa Bosanske ulice – dnevno mjerenje II od 13:00 do 16:00 sati;
- 17.02.2021.godine (srijeda) – Mjereno mjesto 3 – MM3 – Ulica Bosanska Ulica - Lokacija Bosanska ulica ispred kućnog broja 161– večernje mjerenje od 16:00 do 18:00 sati;

Metode mjerenja i vrednovanja vrijednosti nivoa buke vršena su prema međunarodnim standardima ISO 1996/1, 1996/2 i 1996/3, BAS ISO 9612 i BAS EN 60804. Za sva Mjerna mjesta određene su geografske koordinate, odnosno geografska širina i geografska dužina. Također, za svako Mjerno mjesto, odnosno njegovo okruženje određena je namjena prostora obuhvata mjerenja, kako bi se za tu definisanu namjenu prostora mogle uzeti dozvoljene (propisane granične Leq-dan, Leq-veče, Leq-noć i L_1 u dB(A)) vrijednosti buke. Mjerenja su vršena na udaljenosti od 5,0 do 7,0 metara od ivice operativne površine kolovoza saobraćajnice a mjerni uređaj (fonometar) postavljan je na visini od 1,2 metara od nivoa kolovoza. Također, za svaki period vremena mjerenja inteziteta buke uzeti su meteorološki podaci sa web stranice Federalnog hidrometeorološkog zavoda, Meteorološke automatske mejerne stanice za Travnik. Meteorološki parametri koji su evidentirani prilikom svakog mjerenja bili su:

- Temperatura zraka na početku i na kraju perioda mjerenja (dan I, dan II i veče);
- Brzina zraka (vjetra) na početku i na kraju perioda mjerenja ((dan I, dan II i veče);
- Zračni pritisak na početku i na kraju perioda mjerenja (dan I, dan II i veče);
- Relativna vlažnost zraka na početku i na kraju perioda mjerenja (dan I, dan II i veče).



Izvor: Izradio autor uz pomoć Google Earth-a - 15.februara 2021. godine

Slika 1. Pregled svih mjernih mjesta na kojima je vršeno mjerenje

1 - Mjerno mjesto 1 – MM1 – Bosanska ulica – Lokacija: Trg Grada Lajpciga:
Za period mjerenja tokom dana od 07:00 do 10:30 sati, 16.02.2021. godine:
Izmjerene vrijednosti [89]L_{eq}se kreću u rasponu 73,1 do 74,9 db (A) i svo mjerno vrijeme su iznad dozvoljene vrijednosti (za ovu gradsku zonu dozvoljena vrijednost buke za period dan/veče L_{eq} je 55,0 db (A)). Izmjerene vrijednosti [90]L_1 se kreću u rasponu od 88,6 do 90,5 db (A) i svo mjerno vrijeme su iznad dozvoljene vrijednosti (za ovu gradsku zonu dozvoljena vrijednost buke za period dan/veče L_1 je 70,0 db (A)).

2 - Mjerno mjesto 2 – MM2 – Bosanska ulica – Lokacija: Ulaz na Zelenu pijacu sa Bosanske ulice:
Za period mjerenja tokom dana od 13:00 do 16:00 sati, 16.02.2021. godine:
Izmjerene vrijednosti L_{eq}se kreću u rasponu 71,1 do 72,3 db (A) i svo mjerno vrijeme su iznad dozvoljene vrijednosti (za ovu gradsku zonu dozvoljena vrijednost buke za period dan/veče L_{eq} je 55,0 db (A)). Izmjerene vrijednosti L_1 se kreću u rasponu od 85,4 do 89,2 db (A) i svo mjerno vrijeme su iznad dozvoljene vrijednosti (za ovu gradsku zonu dozvoljena vrijednost buke za period dan/veče L_1 je 70,0 db (A)).

3 - Mjerno mjesto 3 – MM3 – Bosanska ulica – Lokacija: Bosanska ulica br. 161
Za period mjerenja tokom večeri od 16:00 do 18:00 sati, 17.02.2021. godine:
Izmjerene vrijednosti L_{eq}se kreću u rasponu 74,1 do 76,4 db (A) i svo mjerno vrijeme su iznad dozvoljene vrijednosti (za ovu gradsku zonu dozvoljena vrijednost buke za period dan/veče L_{eq} je 55,0 db (A)). Izmjerene vrijednosti L_1 se kreću u rasponu od 86,6 do 92,3 db (A) i svo mjerno vrijeme su iznad dozvoljene vrijednosti (za ovu gradsku zonu dozvoljena vrijednost buke za period dan/veče L_1 je 70,0 db (A)).

3. PRIJEDLOG OCJENE PRIHVATLJIVOSTI ZAHVATA UTICAJA ZA OKOLIŠ

3.1. Prijedlog ocjene prihvatljivosti zahvata uticaja na kvalitetu zraka

Na osnovu provedene analize prikupljenih podataka o kvaliteti zraka na teritoriji općine Travnik u period 05.02.-05.03.2021. godine, mogu se izvesti sljedeće pojedinačne konstatcije:

1) Koncentracija prizemnog ozona – O_3, koja direktno utiče na Indeks kvaliteta zraka, potiče većinom od ložišta na čvrsta i tečna goriva (uglja, mazuta, peleta i drugih ekološki nečistih goriva) koja se koriste za zagrijavenje kolektivnih i individualnih objekta. Veoma mali udio potiče iz ispušnih plinova prilikom sagorijevanja goriva iz motora sa unutrašnjim saogorijevanjem. U varijanti izmještanja cestovnog motornog saobraćaja iz Bosanske ulice na ulice i saobraćajnice koje se protežu paralelno sa Bosanskom ulicom, ulica Šehida (M-5, sa sjevera), ulice Vezirsaka i Erika Brandisa, neće doći do smanjena koncentracija prizemnog ozona O_3;
2) Koncentracija lebdećih čestica – $PM_{2.5}$ i PM_{10}, koje također većinom potiču od ložišta na čvrsta i tečna goriva, zatvaranjem Bosanske ulice za cestovni saobraćaj i uređanja iste kao pješačke zone, neće se smanjiti njihova koncentracija u zraku, niti poboljšati kvalitet zraka u samom zahvatu Bosanske ulice;

[89] L_{eq} dB(A) je srednja energetska vrijednost buke promjenljivog nivoa ekvivalentna buci kontinuiranog nivoa mjerenog u trajanju od najmanje 15 minuta u perodima od 06:00 do 22:00 sati (dan) ili 22:00 d0 06:00 sati (noću)

[90] L_1 označava nivo buke koji je prekoračen 1% vremena, a najkraći period mjerenja je 15 minuta

3) Koncentracija azotnog dioksida – NO_2, u analiziranom periodu je bila ili odlična ili zadovoljavajuća, pa zatvaranjem Bosanske ulice za cestovni motorni saobraćaj neće uticati na promjenu stanja kvaliteta zraka u njenom putnom pojasu;
4) Koncentracija sumpor dioksida – SO_2, koja većinom potiče od sagorijevanja goriva motornih vozila cestovnog saobraćaja sa motorima sa unutrašnjim sagorijevanjem, u analiziranom periodu je bila odlična, pa zatvaranjem Bosanske ulice za cestovni motorni saobraćaj neće uticati na promjenu stanja kvaliteta zraka u njenom putnom pojasu;
5) Koncentracija ugljen monoksida – CO, koja također većinom potiče od cestovnih motornih vozila, u analiziranom periodu je bila također odlična, pa zatvaranjem Bosanske ulice za cestovni motorni saobraćaj neće uticati na promjenu stanja kvaliteta zraka u njenom putnom pojasu;

3.2. Prijedlog ocjene prihvatljivosti zahvata uticaja na razinu buke

Analizirajući podatke o razini buke, na osnovu mjerenja provedenih 16. i 17.02.2021. godine, u Bosanskoj ulici, mogu se izvesti sljedeće konstatacije:

1) Razina buke na MM1 – Mjerno mjesto 1 – Lokacija: Trg Grada Lajpciga, premašuje dozvoljeni nivo za L_{eq} u vrijednostima od 33,45 (%) do 35,27 (%), a za L_1 premašuje dozvoljeni nivo od 24,43 (%) do 29,28 (%);
2) Razina buke na MM2 – Mjerno mjesto 2 – Lokacija: Ulaz na Zelenu pijacu iz Bosanske ulice, premašuje dozvoljeni nivo za Leq u vrijednostima od 29,27 (%) do 31,45 (%), a za L_1 premašuje dozvoljeni nivo od 22,43 (%) do 27,43 (%);
3) Razina buke na MM3 – Mjerno mjesto 3 – Lokacija: Bosanska ulica ispred kućnog broja 161, premašuje dozvoljeni nivo za Leq u vrijednostima od 34,55 (%) do 38,90 (%), a za L1 premašuje dozvoljeni nivo od 23,71 (%) do 31,86 (%);

4. ZAKLJUČCI

U pogledu kvaliteta zraka iz gornjih pojedinačnih konstatacija, nameće se generalni zaključak, kao prijedlog ocjene prihvatljivosti zahvata uticaja na kvalitet zraka, da se zatvaranjem Bosanske ulice za motorni saobraćaj tokom 24 sata, odnosno njenim pretvaranjem u pješačku zonu, cijelom dužinom ili djelomično, neće poboljšati trenutni kvalitet zraka u njenom putnom pojasu, odnosno u pojasu pored saobraćajnice namijenjen za kretanje pješaka kao i stanovanje i obavljanje različitih proizvodnih i uslužnih djelatnosti.

U pogledu izmerenih vrijednosti nivoa buke, iz gornjih pojedinačnih konstatacija za mjerna mjesta MM1, MM2 i MM3, možemo donijeti dva generalna zaključaka ili prijedloga:

A) Prvi prijedlog (I varijanta) ocjene prihvatljivosti zahvata, da se zatvaranjem Bosanske ulice za motorni saobraćaj tokom 24 sata, odnosno njenim pretvaranjem u pješačku zonu, cijelom njenom dužinom ili djelomično, razina buke može smanjiti za oko 45,0 do 50,0 (%), odnosno da se vrijednosti L_{eq} spustiti na nivo od oko 51,8 do 51,1 dB (A) a vrijednosti L_1 na nivo od oko 62,5 do 60,5 dB (A). Ove vrijednosti su niže od dozvoljenih vrijednosti i prihvatljive su;

B) Drugi prijedlog (II varijanta) za smanjenje razine buke na Bosanskoj ulici predlaže se ograničavanje brzine kretanja motornih vozila na 30,0 (km/h), čime bi se dozvoljeni nivoi Leq i L_1 smanjili za oko 18,0 (%) iznosili bi za L_{eq} oko 61,0 db(A) a za L_1 oko 75,0 dB(A), što predstavlja vrijednosti nešto malo iznad dozvoljenih ali puno prihvatljivije nego trenutno stanje razine buke na Bosanskoj ulici.

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P.I. HIGH SCHOOL OF TRANSPORT AND COMMUNICATIONS SARAJEVO

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ASSESSMENT OF AIR QUALITY AND NOISE LEVEL IN BOSANSKA STREET - TRAVNIK MUNICIPALITY - IN ORDER TO ARRANGE THIS STREET AS A PEDESTRIAN ZONE

ABSTRACT

Today's way of life in urban areas, due to the increase in the number of motor vehicles and their contribution to air quality, and due to the emission of harmful components of combustion products and the emission of inappropriate noise levels harmful to human health, imposes the need to introduce pedestrian zones in the streets or their individual parts. Such pedestrian zones provide for a ban on the movement of motor vehicles in all or part of the street, except for supply vehicles and utility vehicles during certain periods of the day when the intensity of pedestrian traffic is reduced. With this goal, the municipality of Travnik, at the end of 2020, launched an initiative to prepare a study entitled "Feasibility study of Bosanska Street as a pedestrian zone in Travnik" and entrusted this task to the Faculty of Transport of the International University of Travnik in Travnik. This paper, entitled "Assessment of air quality and noise level in Bosanska Street, Travnik Municipality, in order to arrange it as a pedestrian zone" is an integral part of this study. The conclusions obtained after the research of air quality and noise levels in Bosanska Street, together with other conclusions given in the study in the field of traffic flows, traffic safety, stationary traffic, citizens' needs, needs of economic entities, etc., as well as proposed alternative solutions, will help and serve the authorities in the municipality of Travnik to make decisions for the purpose of complete closure, closure of only one part, or closure at a certain interval during the day for motor traffic and conversion of that street or its part into a pedestrian zone..

Keywords: **air quality, noise emission, motor traffic, study, pedestrian zone**

1.INTRODUCTION

The problem of energy use and environmental protection are certainly at the top of current world problems. Huge amounts of released carbon dioxide (CO2) cause the greenhouse effect, the formation of acid rain, damage to the upper atmosphere and other consequences. All this leads to the gradual global warming of the planet Earth. Also, noise generated by the movement of motor vehicles has a detrimental effect on human health.

The main air pollutants in Bosnia and Herzegovina are defined as solid and liquid fuel furnaces (coal, fuel oil, pellets and other environmentally unfriendly fuels) that are used for heating collective and individual buildings. Road motor vehicles are also considered to be among the most important air pollutants. Road motor traffic, which uses conventional combustion internal combustion engines (SUS engines), is among the largest sources of air pollution. It is estimated that in the atmosphere, in urban areas, 91.0(%) carbon monoxide, 56.0(%) nitrogen oxides, 50.0(%) hydrocarbons and 10.0(%) other particles originates from traffic, that is, from the combustion of fossil fuel in SUS engines. The main air pollutants emitted by exhaust gases from motor vehicles are: carbon monoxide (CO), carbon dioxide (CO2), hydrocarbons (CXHY), nitrogen oxides (NOX), soot, sulfur dioxide (SO2), etc. Also, internal combustion engines emit into the air several very toxic elements such as: lead, fermaldehyde and benzene whose emissions are related to the quality of fuels and their additives.

Noise, which originates from road vehicles, is the type of noise that is most widespread and represents a serious social problem in urban areas. When analyzing the noise generated by road motor vehicles, we should start from the analysis of the characteristics of buses, heavy goods vehicles, individual or passenger cars, motorcycles and continue to the analysis of noise caused by the characteristics of traffic flow, especially in urban areas, where there are uninterrupted and interrupted traffic flows.

The problem of sign quality and the emission of excessive noise levels, as well as other problems caused by the movement of motor vehicles in urban areas, were recognized by the authorities in the municipality of Travnik. In this regard, at the end of 2020, they initiated the process of preparing a study "Feasibility study of the arrangement of Bosanska Street as a pedestrian zone in Travnik". The preparation of the Study was entrusted to the Faculty of Transportation, which exists within the International University of Travnik in Travnik. The segment of the study, which refers to the assessment of air quality and noise level in the area of Bosanska Street, belonged to me. The research lasted from January to May 2020. In the continuation of the paper, the methods of data collection, analysis and proposal of solutions related to this segment will be presented, which was a part of the research regarding the conclusion and variant solutions. Research was also conducted in the segments of traffic flows, traffic safety, stationary traffic, the needs of citizens, economic entities, etc.

2.DATA COLLECTION AND ANALYSIS

2.1.Collection and analysis of air quality data

Based on the latest data for 2020, there were 12,635 registered motor vehicles in the Municipality of Travnik. The structure of registered vehicles is as follows: motor vehicles - 11,535, trucks - 804, motorcycles - 92 and buses - 104.

In order for citizens to have a better picture of the state of air quality, the consequences that can have on health, whether it is short-term exposure to polluted air, as well as to learn how to protect themselves during episodes of increased pollution, air quality can be represented by the Air Quality Index (US Environmental Protection Agency - US EPA Air Quality Index). The value of the air quality index directly indicates the degree of air pollution and possible health problems that citizens may experience a few hours or days after exposure to polluted air.

At the measuring stations in BiH, the average hourly concentrations of the following pollutants are measured: ground-level ozone - O3, particulate matter - PM2.5 and PM10, sulfur dioxide - SO2, nitrogen oxides - NOX and carbon monoxide CO. The greatest threat to the health of the inhabitants of polluted cities in BiH is represented by elevated concentrations of suspended particles and sulfur dioxide. A higher index value means more polluted air and more serious possible health consequences. For example, 50 index points means relatively clean air and a low probability of damage to health, while an index value of over 300 points means high-level pollution, extremely dangerous to the health of all citizens. Index values higher than 100 express air quality dangerous primarily for groups of the population extremely sensitive to pollution, and an extreme increase in the index value means air dangerous for all. Every hour, data are downloaded from the existing official, automatic measuring stations of the competent BiH institutions, which publish their data on the Internet.

For the needs of the Study on the justification of the initiative to arrange Bosanska Street as a pedestrian zone, data on air quality values were monitored through automatic measuring stations in the period 05.02.-05.03.2021.

Analyzing the values of air quality elements in the period 05.02.-05.03.2021, the following can be stated for the observed period:

- **Air Quality Index** values range from 42 to 153 points. This air quality is characterized from satisfactory to very unhealthy, with a large number of days in the analyzed period, the Air Quality Index was unhealthy,
- **ground-level ozone** concentration - **O3** ranged from 42 to 153 (μg/m3). This concentration of ground-level ozone - O3 is characterized from satisfactory to very unhealthy, with a large number of days in the analyzed period, the concentration was unhealthy,
- concentration of **suspended particles** - **PM2.5** ranged from 13 to 107 (μg/m3). This concentration of suspended particles - PM2.5 is characterized from excellent to unhealthy, with a larger number of days in the analyzed period, the concentration was unfavorable,
- concentration of **suspended particles** - **PM10** ranged from 11 to 72 (μg/m3). This concentration of suspended particles - PM10 is characterized from excellent to unfavorable, with a larger number of days in the analyzed period, the concentration was unfavorable,
- concentration of **nitrogen dioxide - NO2** ranged from 2 to 41 (μg/m3). This concentration of nitric oxide - NO2 is characterized from excellent to satisfactory, with a larger number of days in the analyzed period, the concentration was satisfactory,
- concentration of **sulfur dioxide - SO2** ranged from 1 to 12 (μg/m3). This concentration of sulfur dioxide - SO2 is characterized as excellent and had this characteristic throughout the observation period,
- the concentration of **carbon monoxide - CO** had values of 1 (μg/m3). This concentration of carbon monoxide - CO is characterized as excellent and had this characteristic throughout the observation period.

2.2. Collection and analysis of noise level data

Under the term noise, caused by the movement of the vehicle, was previously considered only the noise caused by the operation of the propulsion engine, ie its exhaust system. Today, it is clear that, in addition to the noise caused by the operation of the propulsion engine, there are other sources of noise emitted by vehicles, which in their importance are no less important than the noise produced by SUS engines. These noise sources are especially noticeable at high vehicle speeds. These include: transmission, rolling tire noise, vehicle current surface noise and superstructure noise (which occurs under the influence of resonances).

The noise level is also a function of the vehicle's speed, where the ratio of the pneumatics to the road surface is included. The higher the vehicle speed, the higher the noise level as a result of the resistance of the tires on the tread. The critical speed limit for heavy vehicles is around 50.0 (km / h). If the speed is above 50.0 (km / h) there is a more pronounced noise caused by the contact of the tires with the road surface. If the speed of the motor vehicle is less than 50.0 (km / h), the sources of noise from the drive motor are dominant. When analyzing and calculating the value of the noise level that depends on the speed of the vehicle, values of quantities such as the width of the tire tread, road conditions, flatness of the upper road surface, etc. must be taken into account.

The impact of noise on humans results in mental and physical disorders. It interferes with the necessary rest, sleep and concentration, reduces his productivity and work efficiency, changes in blood pressure and pulse, changes and disorders in the work of the digestive organs, narrowing of the visual field, and can permanently damage the hearing. Due to the fact that noise has a detrimental effect on the human body, the adoption and implementation of regulations on noise protection in the surrounding countries is the responsibility of the Ministry of Health. We have passed the Law on Noise Protection at the level of the Federation of BiH.

For the purposes of this Study, measurements were performed at three measuring points along the city road, Bosanska Street, which extends through the central part of the urban area of the city of Travnik.

Noise level measurements were performed at the following measuring points:

4. Measuring point 1 – MM1 – Bosanska street, Location: Trg Grada Lajpciga;
5. Measuring point 2 – MM2 – Bosanska street, Location: Entrance to the Green Market from Bosanska street;
6. Measuring point 3 - MM3 - Bosanska street, Location Bosanska street no. 161.

Measurements were made with the following measuring equipment: **Phonometer** (Manufacturer: Brüel & Kjær; Type: Integrating Sound Level Meter Type 2239; Factory number: 2358899), **Microphone** (Manufacturer: Brüel & Kjær; Type: 4188; Factory number: 2346370), **Calibrator** (Manufacturer: Bræel ; Type: 4231; Factory Number: 2637563), **Preamplifier** (Manufacturer: Brüel & Kjær; Type: ZC 0032; Factory Number: 14108).

The measuring equipment was rented from the Ministry of Internal Affairs of the Sarajevo Canton, the Uniformed Police Sector, the Traffic Unit. Measurement of the intensity of the total fifteen-minute equivalent noise level was performed at defined measuring points (MM1, MM2 and MM3), and standardization was performed in accordance with the Law on Noise Protection ("Official Gazette of FBiH" No. 110/12);

Immediately before the start and after each measurement of the noise level value, the calibration of the measuring device was performed. Calibration will be performed using a Calibrator (Manufacturer: Brüel & Kjær, Type: 4231, Factory number: 2637563).

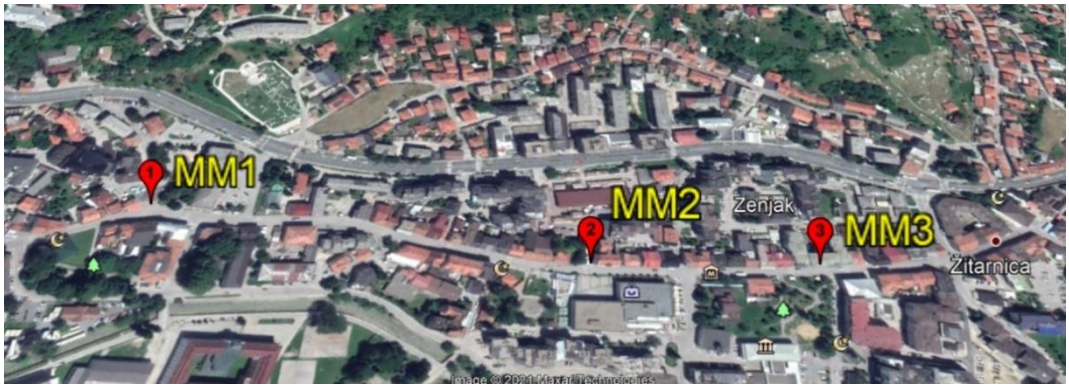
Measurements are performed in three periods, during 24 hours, during the day period I, at time intervals: 07: 00-07: 30, 08: 00-08: 30, 09: 00-09: 30 and 10: 00- 10:30 am, in day period II in time intervals: 13: 00-13: 30, 14: 00-14: 30, 15: 00-15: 30 and 15: 30-16: 00 hours as well as in the evening period in time intervals 16: 00-16: 30, 16: 30-17: 00, 17: 00-17: 30 and 17: 30-18: 00. At the indicated time intervals of 30 minutes each, measurements were performed over a continuous period of 15 minutes. Also, it should be noted that it was not possible to perform a night measurement that is normally performed in the time interval from 22:00 to 06:00 for two reasons. The first is that Bosanska Street is closed to motor traffic from 18:00 to 24:00, every working day and Saturday, and on Sundays from 00:00 to 24:00. The second reason is that at the time of the Study on the justification of the initiative to arrange Bosanska Street as a pedestrian zone, the measures of the Federal Crisis Staff were in force to restrict movement in the period from 23:00 to 05:00.

Measurements were performed on 16th and 17th of February 2021 according to the following dynamics:

- 16.02.2021 (Tuesday) - Measured place 1 - MM1 - Bosanska street - Location Trg Grada Lapciga - daily measurement I from 07:00 to 10:30;
- 16.02.2021. (Tuesday) – Measured place 2 – MM2 – Bosanska street - Location Entrance to the Green Market from Bosanska Street – daily measurement II from 13:00 to 16:00;
- 17.02.2021 (Wednesday) - Measured place 3 - MM3 - Bosanska Street - Location Bosanska Street in front of house number 161 - evening measurement from 16:00 to 18:00;

Methods of measuring and evaluating the values of noise levels will be performed according to the international standards ISO 1996/1, 1996/2 and 1996/3, BAS ISO 9612 and BAS EN 60804. Geographical coordinates, ie latitude and longitude have been determined for all measuring points. Also, for each measuring point, ie its environment, the purpose of the measurement coverage area is determined, so that the allowed (prescribed limit Leq-day, Leq-evening, Leq-night and L1 in dB (A)) noise values can be taken for this defined purpose of space. Measurements were performed at a distance of 5.0 to 7.0 meters from the edge of the operational surface of the road and the measuring device (phonometer) was placed at a height of 1.2 meters from the level of the road. Also, for each period of time of noise intensity measurement, meteorological data were taken from the website of the Federal Hydrometeorological Institute, Meteorological Automatic Measuring Station for Travnik. The meteorological parameters recorded during each measurement were:

- Air temperature at the beginning and end of the measurement period (day I, day II and evening);
- Air speed (wind) at the beginning and end of the measurement period (day I, day II and evening);
- Air pressure at the beginning and end of the measurement period (day I, day II and evening);
- Relative humidity at the beginning and end of the measurement period (day I, day II and evening).



Source: Created by the author with the help of Google Earth - February 15, 2021

Figure 1. Overview of all measuring points where the measurement was performed

1 - Measuring point 1 - MM1 - Bosanska street - Location: Trg Grada Lajpciga:

For the measurement period during the day from 07:00 to 10:30, 16.02.2021:

The measured values of [91]L_{eq} range from 73.1 to 74.9 db (A) and all the measured time is above the permitted value (for this city zone the permissible noise value for the day / evening period of Leq is 55.0 db (A)). The measured values of [92]L_1 range from 88.6 to 90.5 db (A) and all the measured time is above the permitted value (for this city zone the permissible noise value for the period day/evening L1 is 70.0 db (A)).

2 - Measuring point 2 - MM2 - Bosanska street - Location: Entrance to the Green Market from Bosanska street:

For the measurement period during the day from 13:00 to 16:00, 16.02.2021:

The measured values of L_{eq} range from 71.1 to 72.3 db (A) and all the measured time is above the allowed value (for this city zone the allowed value of noise for the period day / evening Leq is 55.0 db (A)). The measured values of L_1 range from 85.4 to 89.2 db (A) and all the measured time is above the permitted value (for this city zone the permissible noise value for the period day / evening L1 is 70.0 db (A)).

3 - Measuring point 3 - MM3 - Bosanska street - Location: Bosanska street no. 161

For the measurement period during the evening from 16:00 to 18:00, 17.02.2021:

The measured values of L_{eq} range from 74.1 to 76.4 db (A) and all the measured time is above the allowed value (for this city zone the allowed value of noise for the period day / evening Leqse is 55.0 db (A)). The measured values of L_1 range from 86.6 to 92.3 db (A) and all the measured time is above the allowed value (for this city zone the allowed value of noise for the period day / evening L1 is 70.0 db (A)).

3. PROPOSAL FOR ASSESSING THE ACCEPTABILITY OF ENVIRONMENTAL IMPACT

3.1.Proposal for assessing the acceptability of the quality impact intervention

Based on the analysis of the collected data on air quality in the municipality of Travnik in the period 05.02.-05.03.2021, the following individual findings can be made:

[91] L_{eq} dB(A) is the mean energy value of the variable noise level equivalent continuous noise level measured for at least 15 min in the period from 06:00 to 22:00 (day), or from 22:00 to 06:00 (at night)

[92] L_1 indicates a noise level that is exceeded 1% of the time, and the shortest measurement period is 15 minutes

6) Concentration of ground-level ozone - O3, which directly affects the Air Quality Index, comes mostly from the combustion of solid and liquid fuels (coal, fuel oil, pellets and other environmentally friendly fuels) used to heat collective and individual buildings. A very small proportion comes from the exhaust gases when burning fuel from internal combustion engines. In the variant of relocating road motor traffic from Bosanska Street to streets and roads that run parallel to Bosanska Street, Šehida Street (M-5, from the north), Vezirsaka Street and Erika Brandisa Street, there will be no reduced concentration of ground-level ozone O3;
7) Concentration of suspended particles - PM2.5 and PM10, which also mostly originate from solid and liquid fuel combustion plants, closing Bosanska Street to road traffic and arranging the same as pedestrian zones, will not reduce their concentration in the air, nor improve air quality in the very intervention of Bosanska Street;
8) The concentration of nitrogen dioxide - NO2, in the analyzed period was either excellent or satisfactory, so the closure of Bosanska Street for road motor traffic will not affect the change of air quality in its road zone;
9) The concentration of sulfur dioxide - SO2, which mostly comes from the combustion of fuel of road vehicles with internal combustion engines, in the analyzed period was excellent, so the closure of Bosanska Street for road traffic will not affect the change of air quality in its lane;
5) The concentration of carbon monoxide - CO, which also mostly comes from road motor vehicles, in the analyzed period was also excellent, so the closure of Bosanska Street for road motor traffic will not affect the change of air quality in its road zone.

3.1.Proposal for the assessment of the acceptability of the intervention impact on the noise level

Analyzing data on noise levels, on the basis of measurements made on 16 and 02.17.2021, in Bosanska Street, can be carried out the following statement:

1) Noise level on MM1 - Measuring point 1 - Location: Leipzig City Square, exceeds the allowed level for Leq in values from 33.45 (%) to 35.27 (%), and for L1 exceeds the allowed level of 24.43 (%) to 29.28 (%);
2) Noise level on MM2 - Measuring point 2 - Location: Entrance to the Green Market from Bosanska Street, exceeds the allowed level for Leq in values from 29.27 (%) to 31.45 (%), and for L1 exceeds the allowed level of 22.43 (%) to 27.43 (%);
3) Noise level on MM3 - Measuring point 3 - Location: Bosanska street in front of house number 161, exceeds the allowed level for Leq in values from 34.55 (%) to 38.90 (%), and for L1 exceeds the allowed level of 23 .71 (%) to 31.86 (%);

4.CONCLUSION

With regard to air quality from the above individual findings, a general conclusion is imposed, as a proposal to assess the acceptability of the impact on air quality, that closing Bosanska Street for motor traffic during 24 hours, or turning it into a pedestrian zone, in full or in part, will not improve the current air quality in its road zone, ie in the zone next to the road intended for pedestrian movement as well as housing and performing various production and service activities..

Regarding the measured values of noise levels, from the above individual statements for measuring points MM1, MM2 and MM3, we can draw two general conclusions or suggestions:

A) The first proposal (variant I) of the assessment of the acceptability of the project, that by closing Bosanska Street for motor traffic for 24 hours, or turning it into a pedestrian zone, its entire length or in part, the noise level can be reduced by about 45.0 to 50.0 (%), that is, lower the Leq values to about 51.8 to 51.1 dB (A) and the L1 values to about 62.5 to 60.5 dB (A). These values are lower than the allowable values and are acceptable;

B) The second proposal (variant II) to reduce the noise level on Bosanska Street proposes to limit the speed of motor vehicles to 30.0 (km / h), which would reduce the permitted levels of Leq and L1 by about 18.0 (%) would be about 61.0 db (A) for Leq and about 75.0 dB (A) for L1, which is slightly higher than allowed but much more acceptable than the current state of the noise level on Bosanska Street.

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EU projekt „LOG-IN“

Sažetak:

Škola za cestovni promet iz Zagreba sudjeluje kao partner u projektu “LOG-IN" u sklopu programa Europske unije Erasmus+.

Nositelj projekta je BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH iz Berlina koji svojim višegodišnjim iskustvom i radom na projektima nastoji ostvariti ideju o uspostavi strateškog partnerstva između ustanova za strukovno obrazovanje i visokog školstva kako bi razmjenom dobre prakse i digitalnih tehnoloških inovacija u strukovnom obrazovanju ojačali njihove međusobne veze i suradnju. Sedam partnera iz četiriju zemalja EU-a pokazat će kako se može ojačati kvaliteta strukovnog obrazovanja i osposobljavanja u području prometa i logistike te njegova relevantnost na tržištu rada putem osposobljavanja usmjerenog na budućnost.

Osim Škole za cestovni promet i Fakulteta prometnih znanosti iz Zagreba, nositelju projekta BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH iz Berlina partneri su: Oberstufenzentrum Logistik, Touristik und Steuern iz Berlina, Njemačka; STC Group, iz Rotterdama, Nizozemska; Poznan University of Technology, iz Poznana, te Zespół Szkół nr 2 im. Przyjaźni Polsko – Norweskiej iz Ostrzeszowa, Poljska.

Cilj projekta "LOG-IN" je jačanje uključivanja digitalnih tehnologija, procesa i aplikacija u programe strukovnog obrazovanja i osposobljavanja u području prometa i logistike. Procesi automatizacije i inovativne tehnologije zahtijevaju nove, posebice digitalne vještine. Usmjerenost korisniku, internacionalizacija i održivost postali su vrlo važni te će se tijekom projekta razvijati inovativne strategije za integraciju digitalnih tehnologija u području prometa i logistike koje su prenosive diljem EU.

Ključne riječi:

- Program za cjeloživotno učenje – Program Erasmus+

- Model digitalnog poučavanja u strukovnom obrazovanju

EU projekt „LOG-IN“

1. O projektu

Nositelj projekta je BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH iz Berlina koji svojim višegodišnjim iskustvom i radom na projektima nastoji ostvariti ideju o uspostavi strateškog partnerstva između ustanova za strukovno obrazovanje i visokog školstva kako bi razmjenom dobre prakse i digitalnih tehnoloških inovacija u strukovnom obrazovanju ojačali njihove međusobne veze i suradnju.

Slika 1.- Logo projekta

Cilj projekta je značajno ojačati digitalne vještine polaznika u obrazovanju i osposobljavanju u sektoru prometa i logistike kako bi se mladi stručnjaci pripremili za zahtjeve koje pred njih stavlja digitalno radno okruženje. Posebni ciljevi su jačanje kapaciteta strukovnih nastavnika i promicanje suradnje među obrazovnim institucijama srednjeg i visokog obrazovanja, te internacionalizacija strukovnih škola. Partneri na projektu su strukovne škole i sveučilišta iz Njemačke, Nizozemske, Poljske i Hrvatske s dugogodišnjim iskustvom poučavanja u području prometa i logistike.

Partneri zajednički razvijaju matricu kompetencija za područje digitalne logistike, model digitalnog poučavanja u logističkim zanimanjima, nastavne jedinice za učenje, te edukaciju za nastavnike.

Projekt traje 32 mjeseca. Započeo je 1. studenog 2019, a trajat će do 30. lipnja 2022. godine.

2. Prvi partnerski sastanak

Prvi od 6 predviđenih partnerskih sastanaka održan je u Berlinu od 4. do 6. prosinca 2019. godine. Nakon uvodnog predstavljanja i međusobnog upoznavanja partnera utvrđena je zajednička vizija projekta, njegovi ciljevi, opseg i rezultati.

Slika 2. - Prvi partnerski sastanak

Dogovoren je način komunikacije i razmjene dokumenata putem zajedničke platforme, utvrđen je pregled intelektualnih rezultata i formirane su radne grupe koje će raditi na definiranim intelektualnim rezultatima. BGZ kao nositelj projekta upoznao je partnere s raspodjelom financijskih sredstava, načinom podnošenja izvješća te načinom prikazivanja rezultata projekta. Nakon uputa i dogovora uslijedio je razgovor o utvrđivanju sličnosti i razlika među zemljama partnerima u području kurikuluma te u razini obrazovanja u svrhu odabira zajedničkog stajališta i razina kvalifikacije. Postignut je dogovor o stavljanju fokusa na razine kvalifikacije 4 i 6 koje su zajedničke svim partnerima.

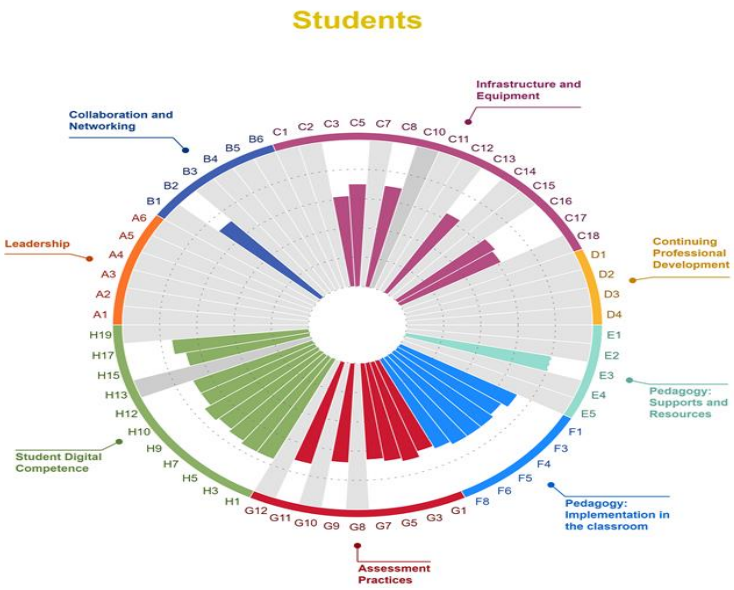
Zaključno, dogovoreni su prvi zadatci na kojima će partneri raditi samostalno i zajednički, a to su:

- Partnerske ustanove će provesti samovrednovanje škola pomoću alata SELFIE radi utvrđivanja digitalnih kompetencija učenika i nastavnika, razine korištenja digitalnih sadržaja za učenje, poučavanje i vrednovanje kao i utvrđivanja stanja opremljenosti škola.
- Utvrđivanje zajedničkih kompetencija učenika izradom matrice kompetencija koja će služiti kao podloga za definiranje tema i sadržaja nastavnih jedinica za digitalno učenje.

3. SELFIE analiza

Škola za cestovni promet provela je u periodu od 8. do 25. rujna 2020. godine samoprocjenu škole pomoću SELFIE alata, čiji rezultati pokazuju koliko u ovom trenutku koristimo digitalne tehnologije za učenje, poučavanje i vrednovanje. U provedbi upitnika sudjelovalo je rukovodstvo škole (71 %), nastavnici (42 %) i učenici (54 %). Područja ispitivanja bila su: digitalne kompetencije učenika i nastavnika te njihovo zadovoljstvo korištenjem digitalnih sadržaja u nastavi, potrebe nastavnika za stručnim usavršavanjem u tom području, infrastruktura i opremljenost škole.

Slika 3. – Prikaz rezultata SELFIE analize



Rezultati samovrednovanja ukazali su na područja na koja treba obratiti pozornost u smislu poboljšanja, te ona koja treba posebno analizirati. Temeljem rezultata putem SELFIE alata izrađen je akcijski plan kojim su predviđena sljedeća poboljšanja u području opremljenosti i infrastrukture: analiza stanja postojeće opreme, naglasak na mogućnost pristupa pomoćnoj tehnologiji za učenike s posebnim potrebama, poboljšanje postojeće opreme i pristupa internetu u svim prostorima škole.

Područje koje zahtijeva analizu je vrednovanje učenika. Rezultati su pokazali da postoji potreba za novim načinima vrednovanja učeničkih postignuća putem tehnologija koje omogućuju nastavnicima individualni pristup vrednovanju učenika koji je u središtu poučavanja. Nastavnici izražavaju potrebu za dodatnim usavršavanjem u području korištenja digitalnih tehnologija kako za poučavanje tako i za vrednovanje. Učenici ističu potrebu za korištenjem ovih tehnologija kroz praktične primjere koji su povezani s njihovom strukom i njihovom uporabom na budućem radnom mjestu.

4. Izrada matrice kompetencija

Nakon provedene SELFIE analize svaki partner pristupio je izradi matrice kompetencija koja uključuje tri područja: učenička znanja, vještine i stavove. Cilj je bio pronaći znanja koja učenici trebaju usvojiti tijekom obrazovanja u području prometa i logistike, vještine potrebne za rješavanje problema, prezentaciju i analizu procesa koje su im potrebne na budućem radnom mjestu, te socijalne vještine kao što su rad u timu, komunikacija, poznavanje stranih jezika i sl. a koje su zajedničke svim učenicima partnerskih škola.

Rad na izradi matrice kompetencija odvijao se putem *online* sastanaka, te stavljanjem dokumenata i njihovim komentiranjem na platformi projekta.

Slika 4. - Matrica kompetencija

COMPETENCE KNOWLEDGE (ON PARTICULAR TOPICS)	Comments	ID	COMPETENCE SKILLS	Comments	ID	COMPETENCE SOCIAL/ATTITUDES
Basics of transportation	Road traffic, rail traffic, sea and inland traffic, air traffic, telecommunication traffic	S1	Differentiation of traffic branches, importance of traffic, differentiating terminals	The student interprets all branches of traffic and their properties	SC1	Adaptibility
Road vehicles	Otto motors (parts, function), Diesel motors (parts, function)	S2	Describe the individual vehicle assemblies, explain the operation of the internal combustion engine	Categorize road vehicles as a means of work according to purpose, circuit design, drive and mode and rhythm maintenance	SC2	Assistance to anyone in the event of a breakdown, meaning of real support
Transportation of cargo	Freight and traffic analysis	S3	Basic concepts in freight transport, cargo insurance, choose the vehicle of transport and the route	The student interprets the application of modern technology, transport documents	SC3	Leadership, importance about safety
Passenger transport	Passenger and traffic analysis	S4	Road passenger transport planning, basic concepts of passenger transport	Timetable, transportation tariffs	SC4	Respecting deadlines (timetable), bad things about smuggling in public transport
Economics of transport	Costs and revenues in traffic	S5	Iterprets basic concepts from transport economics as well as the role and impact of transport on development economy	The market for transport services, economic development of transport	SC5	Economic literacy, learning economics for private life
Road transport regulations	Road safety, traffic regulations	S6	Adopt basic definitions on road safety, sources of traffic law	Traffic rules, the role of the driver/vehicle on the road	SC6	The promotion of that norm of solidarity, humanity and ethical attitude among traffic participants
Traffic tehnique	Safety factors, car accidents	S7	Explain the causes and consequences of road accidents	AutoCAD, Windows	SC7	Effective resolution of any problem
Roads and road structures	Road elements, bridges, tunnels	S8	Create more complex examples of roads and road structures in 2D	AutoCAD, Windows	SC8	Team work
Traffic geography	Map management, basic terms	S9	How geographical factors affect the development of traffic and layout of roads and how it is the reciprocal impact of traffic on geographical environments	Use geographical maps, maps and city map	SC9	Geographical orientation in any environment
Ecology in transport	The impact of transport on ecology	S10	Interpret and implement basic principles and safeguards for environmental protection	Types of pollution, principles of ecology	SC10	Became an environmental friend
Intelligent transport systems	Intelligent traffic management	S11	Intelligent traffic management	The concept and architecture of ITS, intelligent roads and intelligent vehicles	SC11	Thinking "outside the box"
Practical classes	Maintanance of motor vehicles	S12	The student uses theoretical and practical knowledge, skills and habits in the field of road knowledge and maintenance motor vehicles, freight and passenger transport	Rules for working safely, use of analogue and digital techographs, principles of stacking cargo on a vehicle	SC12	Practical solving problems, tidiness, work discipline

Nakon utvrđivanja potrebnih znanja i vještina koje su zajedničke svim učenicima pristupilo se izradi nastavnih cjelina i kreirana cjelina koje će biti podloga za izradu digitalnih efikasnim tema unutar cjelina odvijao se *online* sastancima isključivo za potrebe projekta Log-In. Taj način unatoč izostanku sastanaka uživo.

nastavnih sadržaja. Proces definiranja i prijedlozima putem platforme koja je komunikacije pokazao se uspješnim i

5. Nastavne teme

Nastavne teme kreirali smo prema prethodno spomenutoj matrici kompetencija usklađenoj s partnerima. Prilikom kreiranja vodili smo se značajem pojedine teme za svakog partnera, na način da su svim partnerima nastavne teme korisne i povezane s prethodno definiranim kompetencijama. Unatoč tome, neke teme će pojedini partneri obraditi detaljno, dok će ostali iskoristiti materijale u onoj mjeri u kojoj je to povezano s traženim kompetencijama.

Svaki partner predložio je teme koje smatra korisnima i na osnovu toga definirane su četiri cjeline: Organizacija prijevoza, Upravljanje prijevoznim procesima, Skladišno poslovanje s naglaskom na proces naručivanja te Istraživanje tržišta i poslovne komunikacije. Unutar svake cjeline definirali smo nastavne teme koje ćemo u sklopu projekta obraditi. Kao što je već navedeno, svaki partner će koristiti materijale za pojedinu nastavnu temu u onolikoj mjeri u kojoj to odgovara traženim kompetencijama.

Škola za cestovni promet Zagreb obradit će cjelinu Organizacija prijevoza. Obzirom na kompetencije i kurikulume svih partnera, ova cjelina je dio kurikuluma za programe Tehničar cestovnog prometa i Tehničar za logistiku i špediciju koji se provode u Školi za cestovni promet. Ostali partneri koji sudjeluju na ovom projektu nisu toliko orijentirani na prijevoz, ali prijevoz kao jedna od nastavnih cjelina upotpunjuje ostale skladišne i logističke procese i povezuje ostale teme u jednu cjelinu. Svakako će svatko od partnera pronaći interesantne dijelove nastavnih tema unutar ove cjeline i koristiti ih u svom poučavanju.

Osim prijevoza, Škola za cestovni promet za potrebe traženih kompetencija koristit će i preostale nastavne teme koje nastavnici poučavaju, posebno u području logistike i špedicije prilikom osposobljavanja učenika za stjecanje zvanja Tehničar za logistiku i špediciju. Posebno interesantna nastavna tema su skladišni procesi koji se nadovezuju na samu organizaciju prijevoza i prijevoz. Te dvije teme usko su povezane te je razvijanje naših tema bila svojevrsna nadogradnja razvijanju teme vezane za skladišno poslovanje.

Teme koje se odnose na istraživanje tržišta i poslovnu komunikaciju također smatramo potrebnima, jer se do sada nisu isticale kao važne za razvoj kompetencija učenika u cestovnom prometu. Smatramo da ih treba

svakako uključiti u poučavanje, jer su sastavni dio svakog poslovanja u svakoj grani gospodarstva pa tako i u prometu.

Što se tiče cjeline koja se odnosi na upravljanje prijevoznim procesima, vrlo korisnim smatramo razmjenu iskustava s ostalim partnerima koji ove teme obrađuju na različite inovativne načine koristeći različite aplikacije i digitalne alate.

6. Upotreba aplikacije za poučavanje - ThingLink

Tijekom višestrukih sastanaka i kreiranja tema koje ćemo u sklopu projekta obraditi, velika je pozornost bila posvećena samom načinu njihove obrade. Htjeli smo na neki nov, zanimljiv način temu približiti učenicima, a istovremeno olakšati rad nastavnicima uz postizanje zadovoljavajućih rezultata.

Uz već poznate aplikacije koje koristimo u nastavi, jedan od prijedloga partnera iz Berlina bio je korištenje aplikacije ThingLink. Tema koju obrađuju partneri iz Berlina vezana je za skladišno poslovanje i skladišne procese te su svoju ideju započeli izrađivati u ovoj aplikaciji. Ideja nam se činila odličnom pa smo odlučili svoje teme razvijati unutar ove aplikacije koja prvenstveno služi za poučavanje.

Obzirom da se uslijed pandemije COVID-a pojavila iznenadna potreba za poučavanjem *online*, a kompetencije u velikoj mjeri zahtijevaju sve veću informatičku pismenost i sposobnost korištenja digitalnih alata, aplikaciju thing-link prepoznali smo kao dobar način za pokretanje inovativnosti u poučavanju.

Osim novonastalih okolnosti uslijed pandemije promjenu načina poučavanja zahtijeva i tržište rada. Stoga se od učenika očekuje veća samostalnost u upoznavanju novih tema, a nastavnik usmjerava učenike u stjecanju novih znanja te se veći naglasak stavlja na praktični rad u samoj učionici.

Zbog svih tih novih zahtjeva ova aplikacija nam predstavlja dobar način uvođenja novih metoda poučavanja.

Sama aplikacija nudi niz mogućnosti koje se mogu koristiti u nastavi, a ono što ju čini praktičnom i zanimljivom za učenike je jednostavno korištenje i praćenje koraka koje je nužno slijediti za usvajanje novih znanja u nekom području. S druge strane, nastavnicima neće oduzeti puno vremena definirati korake koje učenici trebaju slijediti, a mogu koristiti postojeće materijale, filmove, audio i video zapise, ali i *online* testove.

Slika 5. - Korištenje aplikacije ThingLink u nastavi

Za sada smo obradili jednu nastavnu temu u ovoj aplikaciji. Planiramo je predstaviti učenicima i nastavnicima kako bismo dobili povratne informacije i dalje ju razvijali sukladno prijedlozima za poboljšanje. Tema koju smo obradili je Radno vrijeme vozača, a detaljnije ćemo ju opisati u sljedećem poglavlju.

7. Nastavna tema – Radno vrijeme vozača

Nastavna tema Radno vrijeme vozača jedna je od tema unutar cjeline Organizacija prijevoza. Ova tema je neizostavni dio kurikuluma u programu Vozač motornog vozila. Temu smo obradili unutar aplikacije ThingLink na način da učenici slijede korake i postavljenim redoslijedom čitaju materijale, gledaju film te rješavaju problemske zadatke i kviz temeljem kojih će sami dobiti uvid u razumijevanje pročitanih materijala. Nakon savladavanja svih pojmova i zadataka, kako bi nastavnici provjerili razumijevanje obrađene teme, učenici će riješiti kviz i problemski zadatak u zadanom vremenu i u određenom postotku u svrhu vrednovanja.

U cijelom procesu poučavanja kroz ovu aplikaciju nastavnikova zadaća je usmjeravanje učenika u korištenju danih materijala i prilikom rješavanja problemskih zadataka koji simuliraju situacije s kojima će se učenici susresti u svakodnevnom radu.

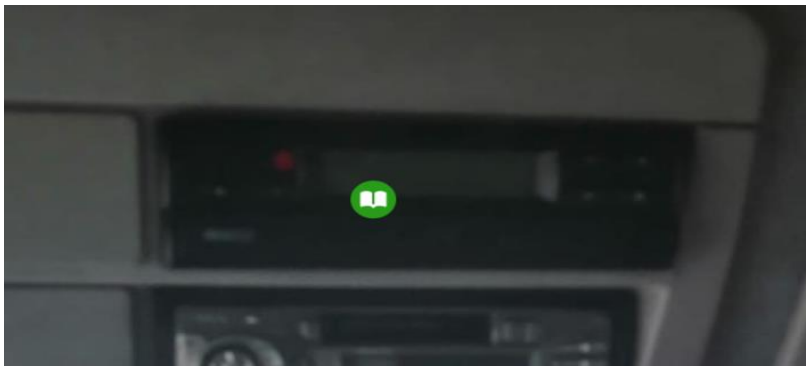
Prilikom pripremanja ove nastavne teme u aplikaciji nastavnik koristi već postojeću PowerPoint prezentaciju, filmove koje prikazuje učenicima tijekom nastave te zadatke i kvizove koje učenici rješavaju na satu, a sada to mogu i od kuće koristeći poveznicu aplikacije na ovu nastavnu temu.

Izrada teme u aplikaciji temelji se na fotografijama unutrašnjosti kamiona i prikazuje učeniku realnu situaciju u kojoj će se učenik naći tijekom izvođenja praktične nastave, što će učeniku olakšati svladavanje teorijskog dijela nastave.

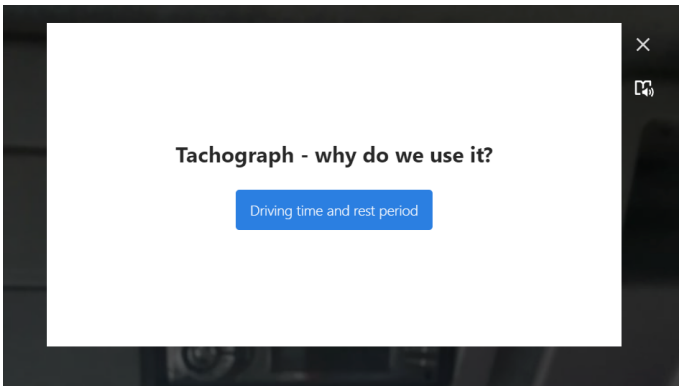
Obzirom da ovu nastavnu temu obrađenu na ovakav način treba još dodatno testirati u nastavi, trenutno imamo nedovršenu verziju nastavne teme koju planiramo kontinuirano razvijati i nadopunjavati.

Ukoliko aplikacija i ovaj način poučavanja budu dobro prihvaćeni od strane učenika i nastavnika, stečena iskustva proširit ćemo i na druge nastavne teme.

Slika 6. - Nastavna tema – Radno vrijeme vozača u aplikaciji ThingLink



Slika 7. - Poveznica za otvaranje materijala



8. Zaključak

Rad na projektu nastavlja se radom na osmišljavanju edukacije za nastavnike. Na njoj trenutno rade partneri iz Rotterdama, a u edukaciji će sudjelovati nastavnici strukovnih predmeta partnerskih škola. Vjerujemo da će rezultati projekta doprinijeti modernizaciji poučavanja a time i kvaliteti i atraktivnosti strukovnog obrazovanja. Razmjena znanja, iskustava te izrada nastavnih materijala koje će koristiti učenici u programima prometa i logistike svih partnerskih zemalja pridonosi internacionalizaciji škole i produbljuje suradnju s partnerskim školama u tom obrazovnom sektoru.

9. Reference i literatura:

https://bgz-berlin.city-web.biz/

www.thinglink.com

ROAD TRAFFIC SCHOOL

JFK Square 8, Zagreb

Renata Heljić graduate engineer - prof. mentor
Željka Turković graduate oecc. - teacher of vocational subjects

Eu project "LOG-IN"

Summary:

The Road Traffic School from Zagreb participates as a partner in the "LOG-IN" project within the European Union's Erasmus + program.

The project holder, BGZ Berliner Gesellschaft für Internationale Zusammenarbeit mbH from Berlin, with its yearlong experience and projects intends to realize the idea of establishing a strategic partnership between vocational education institutions and higher education in order to strengthen their mutual connections and collaboration through the exchange of good practice and digital technological inovations in vocational education. Seven partners from four EU countries will show how the quality of vocational education and training in transport and logistics and its relevance in the labor market can be strengthened through future-oriented training.

In addition to the Road Traffic School and the Faculty of Transport and Traffic Sciences from Zagreb, the project holder's, partners are: Oberstufenzentrum Logistik, Touristik und Steuern in Berlin, Germany; STC Group, from Rotterdam, the Netherlands; Poznan University of Technology, from Poznan and Zespół Szkół nr 2 im. Przyjaźni Polsko - Norweskiej from Ostrzeszow, Poland.

The goal of the "LOG-IN" project is to strengthen the inclusion of digital technologies, processes and applications in vocational education and training programs in the field of transport and logistics. Automation processes and innovative technologies require new, especially digital skills. Customer focus, internationalization and sustainability have become very important and the project will develop innovative strategies for the integration of digital technologies in the field of transport and logistics, which are transferable across the EU.

Keywords:
- Lifelong Learning Program - Erasmus + Program
- Digital teaching model in vocational education

EU project "LOG-IN"

1. About the project

The project holder , BGZ,Berliner Gesellschaft für Internationale Zusammenarbeit mbH from Berlin, with its yearlong experience and projects intends to realize the idea of establishing a strategic partnership between vocational education institutions and higher education in order to strengthen their mutual practice connections and collaboration through the exchange of good practices and digital technological inovations in vocational education.

Picture 1.-Project logo

The aim of the project is to strengthen the digital skills of education and training's participants in the transport and logistics sector significantly in order to prepare young professionals for the demands placed on them by the digital work environment. The specific objectives are to strengthen the capacity of vocational teachers, to promote cooperation between secondary and higher education institutions, and the internationalization of vocational schools. The project partners are vocational schools and universities from Germany, the Netherlands, Poland and Croatia, with yearlong teaching experience in the field of transport and logistics.

The partners jointly develop a matrix of competencies for the field of digital logistics, a model of digital teaching in logistics professions, teaching units for learning and teachers' education.

The project lasts 32 months. It started on the 1st November 2019 and it will last until the 30th June 2022.

2. First partnership meeting

The first of the 6 scheduled partnership meetings was held in Berlin from the 4th until the 6th December 2019. After the introductory presentation and mutual acquaintance of the partners, a common vision of the project, its goals, scope and results were determined.

Picture 2.- First partnership meeting

The method of communication and exchange of documents through a common platform has been agreed, an overview of intellectual results has been established and working groups have been formed to work on defined intellectual results. BGZ, as the project holder, informed the partners about the distribution of financial resources, the method of reports' submission and the project results' presentation. The instructions and agreements were followed by a discussion about identification of similarities and differences among the partner countries in the field of curriculum and level of education in order to select a common position and level of qualification. An agreement was reached to focus on qualification levels 4 and 6, which are common to all partners.
In conclusion, the first tasks on which the partners will work independently and jointly have been agreed, and they are:

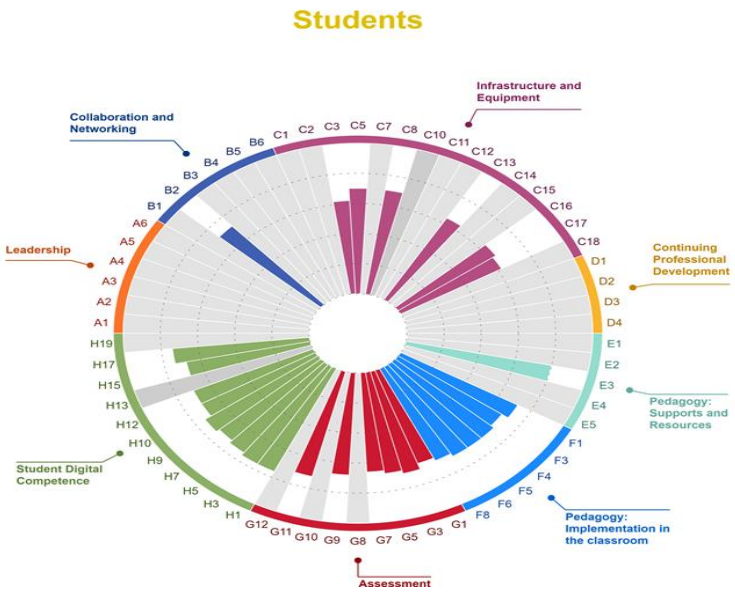
- In order to determine the digital competencies of students and teachers, the use of digital content for learning, teaching and evaluation as well as the state of schools' equipment, it was agreed that partner institutions will conduct a schools' self-evaluation using SELFIE tools.
- In order to determine the common students' competencies by creating a matrix of competencies that will serve as a basis for definition of the topics and content of teaching units in digital learning.

3. SELFIE analysis

In the period from the 8th to the 25th September 2020, the Road Traffic School conducted a school's self-assessment using SELFIE tools and the results show how much we currently use digital technologies for learning, teaching and evaluation. School management (71%), teachers (42%) and students (54%) participated in the implementation of the questionnaire. The areas of research were: digital competencies of

students and teachers and their satisfaction with the use of digital content in teaching, the need of teachers for professional development in this area, infrastructure and equipment of the school.

Picture 3. – SELFIE analysis results



The results of the self-evaluation indicated areas that need to be addressed in terms of improvement, and those that need to be specifically analyzed. Based on the results from the SELFIE tool, an action plan was developed, predicting the following improvements in the field of equipment and infrastructure: analysis of existing equipment, emphasis on access possibility to assistance technology for students with special needs, improvement of existing equipment and Internet access in all school's rooms.

The area that requires analysis is students' evaluation. The results showed that there is a need for new ways of student achievements' evaluation through technologies allowing teachers an individual approach to student evaluation, who is in the center of teaching. Teachers express the need for additional training in the use of digital technologies for both teaching and evaluation. Students emphasize the need to use these technologies through practical examples related to their profession and their use in the future workplace.

4. Development of a competence matrix

After the SELFIE analysis, each partner approached the development of a competence matrix that includes three areas: student knowledge, skills and attitudes. The aim was to find knowledge that students need to acquire during education in the field of transport and logistics, skills needed to solve problems, presentation and analysis of processes needed in the future workplace, and social skills such as teamwork, communication, knowledge of foreign languages, etc., which are common to all students of partner schools.

Work on the development of the competence matrix took place through online meetings, by posting documents and commenting on the project platform.

Picture 4. - Competence matrix

COMPETENCE KNOWLEDGE (ON PARTICULAR TOPICS)	Comments	ID	COMPETENCE SKILLS	Comments	ID	COMPETENCE SOCIAL/ATTITUDES
Basics of transportation	Road traffic, rail traffic, sea and inland traffic, air traffic, telecommunication traffic	S1	Differentiation of traffic branches, importance of traffic, differentiating terminals	The student interprets all branches of traffic and their properties	SC1	Adaptibility
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Roads and road structures	Road elements, bridges, tunnels	S8	Create more complex examples of roads and road structures in 2D	AutoCAD, Windows	SC8	Team work
Traffic geography	Map management, basic terms	S9	How geographical factors affect the development of traffic and layout of roads and how it is the reciprocal impact of traffic on geographical environments	Use geographical maps, maps and city map	SC9	Geographical orientation in any environment
Ecology in transport	The impact of transport on ecology	S10	Interpret and implament basic principles and safeguards for environmental protection	Types of pollution, principles of ecology	SC10	Became an environmental friend
Intelligent transport systems	Intelligent traffic management	S11	Intelligent traffic management	The concept and architecture of ITS, intelligent roads and intelligent vehicles	SC11	Thinking "outside the box"
Practical classes	Maintenance of motor vehicles	S12	The student uses theoretical and practical knowledge, skills and habits in the field of road knowledge and maintenance motor vehicles, freight and passenger transport	Rules for working safely, use of analogue and digital tachographs, principles of stacking cargo on a vehicle	SC12	Practical solving problems, tidiness, work discipline

After determination of the necessary and common knowledge and skills, the creation of teaching units, which will be the basis for the development of digital teaching content, started. The process of defining the units and topics within the units took place through online meetings and proposals on a platform created exclusively for the needs of the Log-In project. This way of communication proved to be successful and efficient despite the absence of live meetings.

5. Teaching topics

We created teaching topics according to the previously mentioned matrix of competencies harmonized with our partners. When creating, we were guided by the importance of each topic for each partner, in such a way that the teaching topics were useful to all partners and related to previously defined competencies. Nevertheless, some topics will be covered in detail by individual partners, while others will use the materials to the extent related to the required competencies.

Each partner proposed topics that were considered useful and based on that four units were defined: Transport Organization, Transport Process Management, Warehousing with an emphasis on the ordering process, and Market Research and Business Communication. Within each unit, we defined the teaching topics that we will cover as part of the project. As already mentioned, each partner will use materials for a particular teaching topic to the extent that it corresponds to the required competencies.

The Road Traffic School from Zagreb will cover the Transport Organization unit. Considering the competencies and curricula of all partners, this unit is part of the curriculum for the professions of Road Traffic Technician and Logistics and Forwarding Technician, which are conducted at the Road Traffic School. Other partners participating in this project are not so transport-oriented, but transport as one of the teaching units complements other warehousing and logistics processes and connects other topics into one unit. Certainly, each of the partners will find interesting parts of the teaching topics within this unit and use them in their teaching.

Except transport, the Road Traffic School, for the needs of the required competencies, will use the remaining teaching topics that teachers also teach, especially in the field of logistics and forwarding when training students for the profession of Logistics and Forwarding Technician. A particularly interesting topic are warehousing processes that are closely connected to the organization of transport and transportation itself. These two topics are closely related and the development of our topics was a kind of upgrade to the development of topics related to warehousing.

Topics related to market research and business communication are also considered necessary, because so far they have not been highlighted as important for the development of students' competencies in road traffic. We believe that they should definitely be included in teaching, because they are an integral part of every business in every branch of the economy, including transport.

Regarding the unit related to the management of transport processes, we find it very useful to share experiences with other partners who process these topics in different innovative ways using different applications and digital tools.

6. Using the teaching application – ThingLink

During the multiple meetings and the creation of the topics that we will cover as part of the project, great attention was paid to the way they were processed. We wanted to bring the topic closer to the students in a new, interesting way, and at the same time facilitate the work of teachers while achieving satisfactory results.

In addition to the already known applications that we use in teaching, one of the suggestions of the partners from Berlin was to use the ThingLink application. The topic covered by the partners from Berlin is related to warehousing and warehousing processes, and they started to develop their idea in this application. The idea seemed great to us so we decided to develop our themes within this application

which is primarily used for teaching.

Because of the sudden need for online teaching due to the COVID pandemic, students are increasingly computer literate, competencies largely require increasing IT literacy and the ability to use digital tools, this way of teaching seemed to be a good way to drive innovation in teaching. In addition to the demands of the labor market, there is also a need to change the way of teaching. Students are expected to be more independent in learning new topics, the teacher guides students in acquiring new knowledge and greater emphasis is placed on practical work in the classroom. Because of all these new requirements, this app is a good way for us to introduce new teaching methods.

The application itself offers a number of teaching opportunities and what makes it practical and interesting for students is the ease of its usage and tracking of the steps necessary to acquire new knowledge in a particular field. On the other hand, it will not take long for teachers to define the steps that students need to follow and they can use existing materials, films, audio and video, but also online tests.

Picture 5. - Using ThingLink in teaching

So far, we have covered one teaching topic in this application. We plan to present it to the students and teachers to get feedback and develop it further according to the suggestions . The topic we covered is Drivers' Working Hours, and we will describe it in more detail in the next chapter.

7. Teaching topic - Drivers' working hours

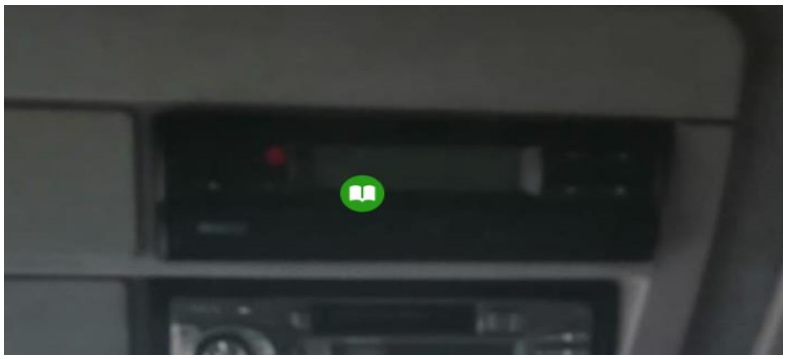
Teaching topic Driver's working hours are one of the topics within the Transport Organization unit. This topic is an indispensable part of the curriculum in the Motor Vehicle Driver program. We covered the topic within the ThingLink application in a way that students follow the steps and read the materials in the set order, watch the film, solve problems and a quiz based on which they will gain insight into

understanding the read materials. After mastering all the concepts and tasks, in order to check the understanding of the processed material, students will solve a quiz and a problem task in a given time and in a certain percentage for the purpose of evaluation.

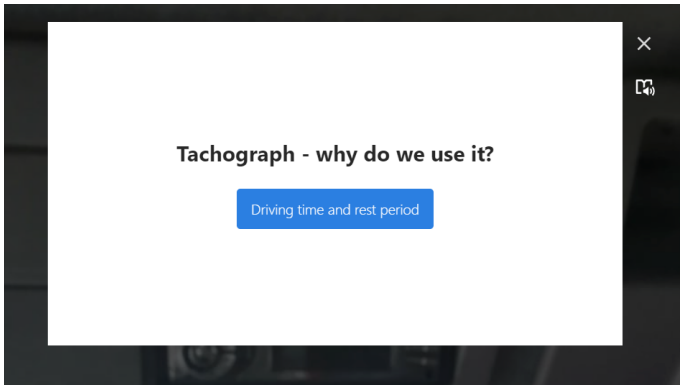
Throughout the teaching process with this application, the role of the teacher is to guide the student in the use of given materials and in solving problem tasks that bring students into situations they will encounter in everyday work.
When creating this teaching topic in the application, the teacher uses an existing powerpoint presentation, movies that he shows to students during class and tasks and quizzes that students solve in class, and now they can do it from home using the application link to this teaching topic.
The creation of the topic in the application is based on the pictures inside the truck and shows the student the real situation in which the student will find himself/ herself during practical classes, making it easier for the student to master the theoretical part of the class.
Considering that this teaching topic treated in this way needs further testing in the teaching itself, we currently have an unfinished version of the teaching topic and we plan to continuously work on it and develop it in this way.

If the application and this way of teaching show themselves as a positive experience for students and teachers, we will continue to use it for other teaching topics and it will certainly become an indispensable way of teaching.

Picture 6. - Teaching topic - Drivers' working hours in the ThingLink application



Picture 7. - Link to open the material



8. Conclusion

Work on the project continues with work on designing currently ongoing education for teachers. Partners from Rotterdam are working on it, and teachers from vocational subjects of partner schools will take part in the education. We believe that the results of the project will contribute to the modernization of teaching and thus the quality and attractiveness of vocational education. The exchange of knowledge, experiences and the development of teaching materials used by students in the transport and logistics programs of all partner countries contributes to the internationalization of the school and deepens cooperation with partner schools in this educational sector.

9. References and literature:

https://bgz-berlin.city-web.biz/

www.thinglink.com

S.O.U "Riste Risteski – Ricko" – Prilep

Dipl.soob.inž.Prof. Violeta Sekuloska

Tema:

Gradenje na soobraќajnata kultura

Apstrakt:

Suštinskata razlika na životot nekogaš i denes e brzinata. Denes luǵeto za pokratko vreme treba da napravat značitelno pogolem broj na raboti, sporedbeno so nekogaš. Za da se postigne toa, neophodno e zgolemuvanje na brzinata. No toa zgolemuvanje so sebe nosi i niza na negativni posledici. Našata uloga kako stručnjaci vo oblasta na soobraќajot e da ovozmožime zgolemenata brzina da ne bide pričina za nesakanite posledici. Načinite za toa možat da bidat različni, stručnosta e da se izbere soodvetniot način vo soodvetno vreme.

Denes životot ne može da se zamisli bez dviženje. Taa glavna uloga za sekojdnevniot život ja prevzema soobraќajot. Soobraќajot e glavnata alka vo sindžirot na životot.Do kolku istata ovozmoži povrzuvanje na ostanatite delovo od sindžirot,…se dobiva besprekoren izgled na sindžir koj ne samo što ќe bide korisen tuku i ќe izgleda veličenstveno. Meǵutoa vo sindžirot na životot ne se spojkite sekogaš ubavo namesteni, pa i samite alki ne sekogaš go imaat onoj posakuvan redosled, takov e slučajot i so soobraќajniot sindžir koj predstavuva samo alka vo sindžirot na životot.

Brojkite koi gi imame vo crnata statistika se zaprepastuvački, a situacijata apokaliptična. So ovie brojki nikako nemožeme da se pomirime a kamoli da se gordeeme. Za taa cel prevzemenite akcii za izgradba na bezbeden soobraќaj nikogaš ne se dovolni. Životniot sindžir i soobraќajnata alka koja najčesto e povtoruvački element na toj sindžir, nikako netreba da bidat bez soodveten plan i programa, naprotiv sekoja alka na toj sindžir, pa i sekoja spojka koja gi drži alkite soodvetno, moraat zadolžitelno da bidat spored soodvetni pavila i propisi koi bez isklučok, sekogaš i sekade moraat da se počituvaat. Samo taka se gradi soodvetna soobraќajnata kultura koja se stavavo uloga na sekoj učesnik vo soobraќajot bez razlika dali istiot vo toj moment e aktiven ili pasiven učesnik na soobraќajot. I samo togaš crnata statiskika možebi nema da bide tolku crna ili vo najdobar slučaj nema da stanuva voopšto zbor za crna statistika.

Klučni zborovi:

Soobraќaj

Dviženje

Život

Sindžir

Kultura

Glaven del:

Vo samiot početok na ovoj trud beše napomenato za važnosta na soobraќajot, no i za negovoto prokletstvo. Celta na ovoj mal trud e da se namali vlijanieto na toa prokletstvo koe ne stava vo situacija seriozno da se pozanimavame so problematikata za bezbednosta vo soobraќajot. Gradenjeto na soobraќajnata kultura e samo eden čekor kon izdignuvanje na bezbednosta vo soobraќajot na solidno nivo, kade prokletstvoto koe se pojavuva so koristenjeto na soobraќajot ke bide neznačitelno.

Mnogumina bi rekle:"Da imaat patištata duša,…imaat što da kažat no i što da ne naučat". Ni najstrašnite sceni od horor filmovite, nemožat ni delumno da ja dolovat taa strašna, no vistinita slika što sekoj den se režira na patištata širum svetot…Se postavuva prašanjeto, dali taa slika možeme barem za mig, delumno da ja promenime? Se razbira deka možeme i morame i ne samo za mig i ne samo delumno, tuku celosno i trajno. Eden od osnovnite i najbitni postapki e gradenjeto na soobraќajnata kultira.

Soobraќajnata kultura e specifičen vid na kultura koja treba da ja poseduvaat site učesnici vo soobraќajot. Toa e mošne važen element na bezbednosta vo soobraќajot i ne pretstavuva samo poznavanje na soobraќajnite pravila i propisi i umešnost na upravuvanje so vozilo, tuku i način na dviženje i odnesuvanje vo soobraќajot koj ќe bide soobrazen so opštite interesi na učesnicite vo nego, na koi bezbednosta vo soobraќajot ќe bide nad i pred se. Postojniot vospitno-obrazoven sistem očigledno deka toa ne go postignuva, zatoa potrebna e promena vo pristapot na gradenje na soobraќajnata kultura i istata da se gleda kako na del od opštata čovekova kultura. Za da istoto dobie primena vo praksa, potrebno e da se lociraat celni grupi, so koi ќe se ovozmoži soodveten pristap. Kako celni grupi bi možele da bidat:

1.Učenici od osnovnoto obrazovanie

-učenici od poniskite klasovi;

- učenici od povisokite klasovi.

2. Učenici od srednoto obrazovanie

3.Ostanati učesnici

-pešaci;

-velosipedisti i motociklisti;

-vozači na motorni vozila.

Načinite za gradenje na soobraќajnata kultura može da bide vrz osnava na slednite postapki:

1.Organiziranje na rabotilnici

2. Organiziranje na natprevari

3. Organiziranje na debati

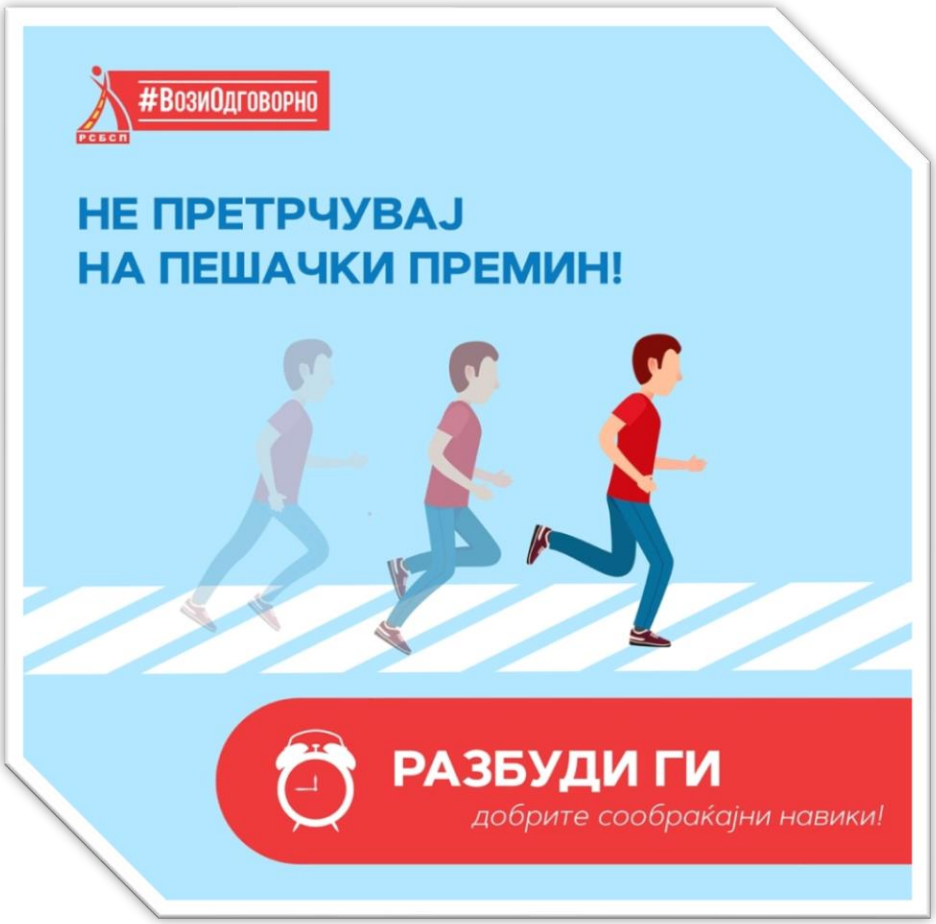
4. Organiziranje na edukativni predavanja

5. Organiziranje na kazneni predavanja

Celnite grupi i načinite za edukacija možat da se zgolemuvaat i da se vidoizmenuvaat, vo zavisnost od novonastanati soobraќajni situacii.

Kulturata i etikata vo soobraќajot se učat od mali noze. Samiot process na edukacija e daleku polesen proces od procesot na promena na navikite i kulturata vo soobraќajot. Tokmu zatoa, neophodno e da gi naučime decata na soobraќajna kultura od najrana vozrast. Na toj način se formira edna cvrsta podloga na koja može da se gradi solidna soobraќajna kultura. Iskustvoto pokažuva deka gi učime decata na mnogu raboti, a nedovolno za toa kako da se odnesuvaat vo soobraќajot, kako da bidat bezbedni i voedno primerni učesnici. Karakteristično e toa što najgolem del od učesnicite vo soobraќajot se edinstveni vo stavot deka soobraќajnata kultura i etika ne se na potrebno nivo, no za žal rečisi site gi baraat propustite kaj drugite, a pri toa zaboravaat deka soobraќajot e složen sistem, mozaik vo koj site nie participirame. Za taa cel podlogata koja treba da se izgradi kaj najmalata populacija ne se samo učenicite tuku idecata od predškolska vozrast. I kaj ednite i kaj drugite, zaradi vozrasta potrebno e da se napravat soodvetni rabotilnici koi niz igra ke im gi ukažat osnovnite postapki koi treba da gi realiziraat vo sekojdnevniot soobraќaj.

Ќe navedam eden primer koj iako na prv pogled možebi zvuči banalno sepak ќe ne navede na razmisluvanje deka e potrebna edukacija na ova vozrasna grupa, a toa e preminuvnjeto preku kolovoz. Site roditeli iučiteli gi učat decata deka kolovozot se preminuva na pešački premin, no mnogu retko im se ukažuva kako. Da ne zaboravime deka decata se najnepromislenite učesnici vo soobraќajot zaradi nivoto na razum koj go poseduva taa vozrasna grupa. Se zaboravame daim ukažeme na decata deka za da se premini preku ulica ne e samo biten pešačkiot premin ami i načinot na pominuvanje preku istiot. Sekoe dete treba da nauči deka pred da premini preku ulica najprvo treba da zastani, da gi izvadi racete od džebovi, da pogledne levo desno i bez da trča dokolku nema vozila da pomini preku pešačkiot premin. Treba samite da si priznaeme deka često zaboravame na nivnata vozrast i smetame deka tie toa veќe go znaat, no gadno se lažeme. Vtor primer koj tuka sakam da go navedam, a e istovremeno namenet ina vozačite e deka koga izleguva na ulica topka, obavezno sledi pretrčuvanje na dete koe e nasočeno kon pravecot kade što zaminala topkata bez pri toa da razmisli za posledicite koi možat da nastanat. Tokmu na ovie dva elementi treba da bidat nasočeni edukativnite rabotilnici kade decata so igra ke gi naučat vistinskite postapki, a so toa i ispešno formiranje na podloga vrz koja ke se gradi soobraќajnata kultura na edna ličnost.



Sl. Br. 1 Nepravilno preminuvanjne na pesacki premin

Učenicite od povisokite klasovi na osnovnoto obrazovanie imaat potreba od poinakov pristap koga stanuva zbor za gradenje na soobraќajnata kultura. Koi se nedostatocite koi ovaa starosna grupa gi ima vo odnos na soobraќajnata kultura? Spored mene na ovaa grupa najpoveќe treba da i se skrene vnimanie na postapkite koi učenicite gi pravat koga upravuvaat velosiped i koga se dvižat kako pešaci ili kolona na pešaci vo i nadvor od naseleno mesto. Koga stanuva zbor za vozenje na velosiped, ovaa grupa na učesnici sakaat na nesoodveten način da gi pokažat svoite veštini ili da prevezuvaat drugo dete na svojot velosiped, bez pri toa da bidat zapazeni osnovnite bezbednosni merki. Vtorata problematika, za dviženje na učenicite sami ili vo grupa, vo ili nadvor od naseleno mesto, može slobodno da se kaže deka istite ne znaat dali treba da odat eden zad drug, na levata ili na desnata strana na kolovozot koga istiot nema trotoar. So otvaranje na debatni diskusii ili so organiziranje na natprevari kade ke se obrne posebno vnimanie na ovie problematiki i ke se diskutira zošto treba vo naseleno mesto pešacite da se dvižat isklučivo na mesta za pešacite, kako trotoarite ili pešačkite pateki, nadvor od naseleno masto zošto pešakot treba da se dviži do leviot rab na kolovozot smetano vo pravec na dviženje na vozilata, bez razlika dali e eden ili kolona na pešaci, zošto kolonata ne smee da bide podolga od 50m i slično. Isto taka treba da se napomene koi se posledicite od nesoodvetnoto upravuvanje na velosiped i kade se e dozvoleno dviženjeto so velosiped. So pomoš na diskusii ke se doveduvaat učenicite sami da go otkrijat odgovorot na ovie problematiki i samo taka nikogaš nema da si dozvolat da gi zaboravat i da gi prekršat. Zarem toa nee dovolno za vložuvanje na vakov trud?

Ostanatite starosni grupi se staveni vo grupata na ostanati učesnici vo soobraќajot koi od svoja strana se najmnogubrojni i najheterogeni. Za taa cel tuka ќe se posveti najgolemo vnimanie, ne deka nekoja grupa e považna ili pomalkuvažna.

Problematikata koja se provlekuva godini nanazad, a e predizvikana od pešacite, se odnesuva vo slednoto:

-preminuvanje na kolovozot na nesoodvetni mesta;

-preminuvanje na kolovozot nesoodvetno na pešački premin.

Sekojdnevno sme svedoci na neodgovornosta na pešacite koi go pominuvaat kolovozot na mesta koi ne se nameneti za pešacite, pa duri i samite nie sme go napravile istoto. Isto taka postoi golem broj na pešaci koi go zloupotrebuvaat svoeto pravo koga stanuva zbor za pominuvanje na kolovozot na pešački premi, a kako za primer ke gi posočam slednite:

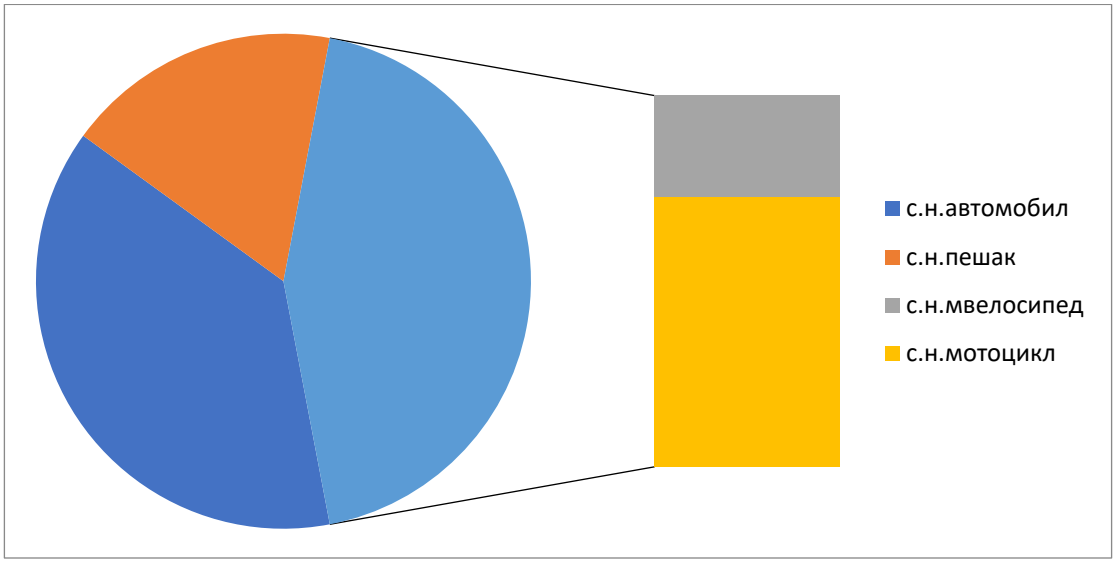
- zborivanje na telofon

-bavno preminuvanje preku preminot.

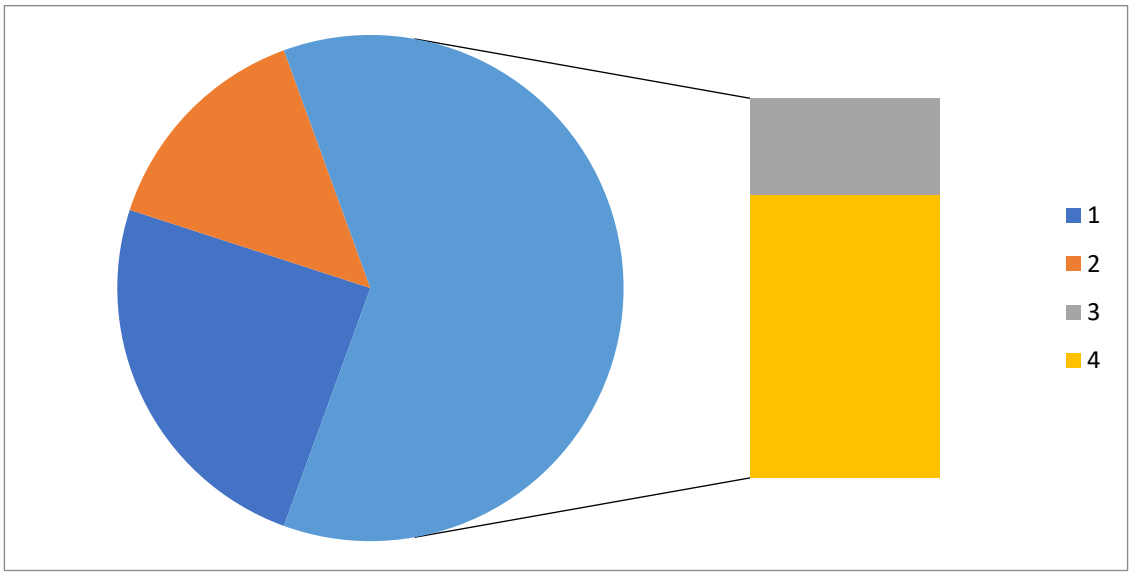
Na pešačite seušte ne im e jasno deka i ako se naoǧaat na obeležan pešački premin, nemožat da se odnesuvaat neodgovorno i nonšalantno. Bavnoto dviženje na pešačkiot premin, kako i zboruvanjeto na mobilen telefon sozdava revolt kaj vozačite koi gi propuštaat patnicite od edna strana, im se odzema vnimanieto na samite pešaci i se sozdava guzva na preminite od druga strana.

Koi se merkite koi ќe ovozmožat namaluvanje na ovoj problem i voedno zgolemuvanje na nivoto na soobraќajnata kultura? Za site ovie slučaevi koi se napraveni od pešacite, potrebno e da se primenat i edukativnite no i kaznenite predavanja. Soobraќajnata policija potrebno e vakvite učesnici da gi upati na edukativno-kazneno predavanje koe ke im ukaže na pešačite koi se posledicite od vakvoto nivno odnesuvanje. Sekoj pešak treba da dobie pokana na lice mesto za denot i časot koga istiot mora da se pojavi na toa predavanje. Dokolku nekoj ne e vosostojba vo toj den/čas da bide prisuten na predavanjeto, istoto mora da go napravi na slednotopredavanje koe e organizirano najbrzo posle toj termin. Dokolku pak pešakot nema da se pojavi i na slednoto predavanje istiot da bide kaznet so parična kazna ili so izvedba na korisno-društvena rabota.

Velosipedistite i motociklistite i ponatamu ostanuvaat najranlivite grupi na učesnici vo soobraќajot. Ako se zeme vo predvid delot od soobraќajot koj im pripaǧa nim i nivnoto učestvo vo vkupniot broj na zaginati i povredeni velosipedisti i motociklisti vo soobraќajnite nezgodi, ќe zaklučimedeka brojot e nesrazmerno visok vo odnos na toa vo kolkav del od soobraќajot tie učestvuvaat.



Dijagram br.1 Broj na nezgodi vo soobraќajot



Dijagram br. 2 Broj na nastradani vo nezgodi

Fakt e deka i velosipediistite i motociklistite se pomalku zaštiteni vo sporedba so drugite vozači na motorni vozila iso samoto toa i poveќe se izloženi na rizik i opasnosti vo soobraќajot, no isto taka fakt e deka nesoodvetnata soobraќajna infrastruktura značitelno ja vlošuvaat bezbednosta na velosipedistite i motociklistite vo soobraќajot. Koi se najčestite nepravilni situacii koi ovaa grupa na učesnici gi pravi a ne se soodvetno iskristalizirani vo samiot zakon za bezbednost na soobraќajot na patištata.

Nesomneno uzurpacijata na prostorot koja ja pravi ova grupa na učesnici e najgolemiot problem koj istite go predizvikuvaat i tokmu vo toj domen treba najpoveќe da se reagira. Načinite možat da bidat identični kako i kaj prethodnata grupa, no pristapot sosema porazličen. Imeno kaj ova grupa edukativnite predavanja nikako nema da bidat bez kaznenite predavnja, naprotiv tie bi bile vklučeni vo edno, bez pravo na prolongiranje na terminate za prisustvo na edukacija.

Sl. Br. 2 Gradenje soobraќajna kultura kaj velosipedistite i motociklistite

Avtomobilskiot soobraќaj e nesomneno najbroen i voedno so možnost za gradenje na najdobra soobraќajna kultura. Koi se momentite kade zakonot e dvosmislen, nedorečen ili možebi nekoi raboti se izzemeni od zakonot, a se odnesuvaat na ovaa grupa na učesnici.

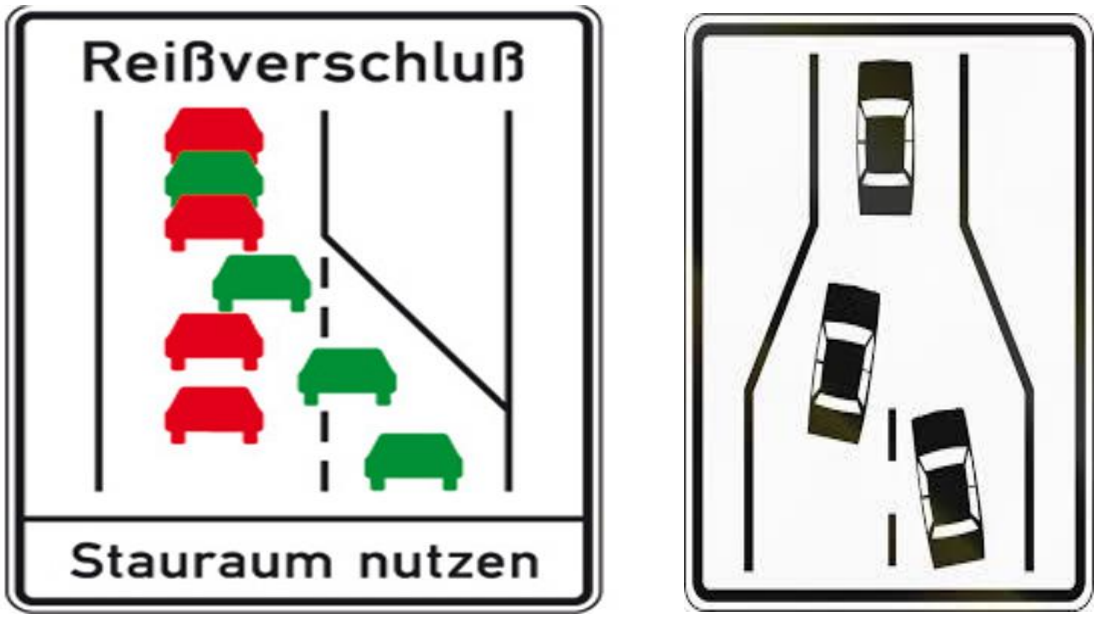
Mnogu česta e pojavata i čuvstvoto, da koga ќe se vratime so vozilo od stranstvo, pokraj drugoto imame vpečatok za tamošnata vozačka kultura. Vo zavisnost od toa kade sme patuvale, vpečatocite ќe bidat pozitivni ili negativni. Dokolku se pozitivni komentarot e kako tamu vozačite se kulturni a kaj nas nekulturni, nevospitani i sl. Koi se pričinite zošto eden ist vozač se odnesuva različno vo različni zemji.Istiot toj vozač, što e najtragično, ili možebi komično, gi dava tie kritiki koi od svoja strana i sam gi pravi. Tokmu vo ovie moment imame dobra možnost za gradenje na soobraќajna kultira i toa so site možni sredstva, dali toa ќe bidat edukativni, kazneni, debati ili slično, bitno e da se ovozmoži razvivanje na svesta na samite vozači.

Za taa cel ќe navedam nekolku primeri koi mnogu od nas imale prilika da gi zabeležat pri nekoi nivni patuvanja niz Evropa, koi na prv pogled možebi nezbeležitelni no mnogu korisni i voedno sekade primenlivi.

Prv primer e zafatenosta na racete, dali toa ke bide cigara, šiše so voda, mobile telefon i sl.Nekoi zemji se popustlivi koga stanuva zbor za koristenjeto na mobile telefon so posebna naprava so koja racete nema da bidat zafateni, no kade e tuka psihološkiot efekt od razgovaranjeto po telefon, vnimanieto i toa kako se nasočuva kon razgovorot pri što se zanemaruva voziloto, patot i patnata okolina, a da ne zboruvame za drugite prethodno nabroeni raboti koi pokraj vnimanieto gi zafaќaat i racete.

Vtor primer e situacija koga se javuva kolona na vozila, zastoi ili usporuvanje na soobraќajot, pogolemiot del od vozačite ќe gi pritisnat zvučnite signali koi što od svoja strana nitu ќe ja rešat nitu ќe ja ublažat taa situacija. Mal broj od vozačite ќe gi zapalat četirite trepkači i toa onoj koj e posleden vo kolonata. Mnogu korisen gest koj ja pokažuva vozačkata kultura na visoko nivo vo soobraќajno - tehnički i pravno uredeni zemji, bidejќi so vkučuvanje na četirite trepkači, mnogu poveќe se odvlekuva vnimanieto za potencijalnata opasnost na patot.

Tret primer e situacija koga dve soobraќajni lenti se spojuvaat vo edna ili situacija pri gužva pri vklučuvanje vo soobraќaj, slična na prethodno spomnatata, situacija takanarečena “rajfešlus”. Toa e situacija kade doağa do tenzično “upikuvanje” na vozilata. Dokolku sakame da gradime visoko nivo na soobraќajna kultura, vo ova situacija treba da se postapi na slednit način,…VIE, dokolku se dvižite po soobraќajnata lenta vo koja se vklučuvaat drugite vozila, propuštete edno vozilo, a potoa prodolžete so vozenje pozadi nego, pri što vašiot primer treba da go sledat i drugite pozadi vas. Samo taka, namesto pcuenje, turkanje, tenzija, gestikulacija so race i nerviranje, situacijata ќe se odviva poleka no sigurno i redosledno eden po eden.



Sl. Br. 3 Gradenje soobraќajna kultura kaj avtomobilistite

Postojatmnogu vakvi slični primeri koi i ako ne se po zakonska regulativa ite kako možat ne samo da go podobrat nivoto na soobraќajna kultura, tuku i da obezbedat bezbeden soobraќaj koj site go sakame, no malku go praktikuvame. Dovolno e ovie i sličnite vakvi primeri da si najdat svoe mesto vo zakonskata ramka na zakonot za bezbednost na soobraќajot na patištata i istoto da stani del od nasokite pri obuka na vozači.

Zaklučok:

Na krajot da se vratime na početokot,…gradime li soobraќajna kultura, najprvo sekoj od nas, pa potoa kako grupa, opština ili država. Da počneme od sebesi i da davame sekogaš i sekade primer za da bidime del od skaliloto koe vodi do visoko nivo na soobraќajna kultura.”Bon-tonot”, nee namenet samo na mažite i samo vo odredeni situacii,…negovoto značenje i primena vo soobraќajot nikade nee zabeležan iako e navistina neophodno potreben. Gradenjeto na soobraќajnata kultura e process koj ne prestanuva, koj može da se gradi i nadgraduva vo site segmenti na životot , vklučuvajќi go i soobraќajot, kako negov osnoven

sostaven del. Porakata e upatena kon sekoj učesnik, kon sekoja grupa na učesnici i kon sekoja zasegnata institucija. Često pati soobraќajot go narekuvaat “čuma na 21-vi vek”, koe ne stavavo situacija da prevzemame drastični i seriozni čekori kon promena na ova pridavka. Neka ovoj mal tekst posluži vo edukativni celi za da poleka počneme da gi otfrlame negativnite,a gi primenuvame pozitivnite iskustva od različni situacii i različni zemji niz svetot. Da bideme kritični no i samokritični bidejќi soobraќajnata kultura se manifestira vo odnos na vozač kon vozač, vozač kon patnik, vozač kon pešak,…no iobratno, vozač kon životni koi ќe se najdat na patot, vozač kon patištata i životnata okolina, vozač kon pravilata i propisite no i kon samiot sebe. Samo taka ќe izgradime soobraќajna kultura koja ќe ovozmoži da sekoe patuvanje bide ubavo doživuvanje,…samo taka prikaznata koja ja raskažuvaat patištata ќe ima sreќen kraj.

S.O.U "Riste Risteski – Ricko" – Prilep

Dipl.traffic eng.Prof. Violeta Sekuloska

Subject:

Building of the traffic culture

Abstract:

The key difference between the life earlier and today is speed. Today people take shorter time to do variety of things, compared to earlier days. To accomplish that it is crucial to increase the speed. But increasing the speed is also bringing negative consequences. Our role as experts in traffic is to prevent increased speed to lead to unwanted consequences. There are numerous ways to achieve that, expertise is an art to choose appropriate way in appropriate time.

Today we can't imagine life without constant movement. This leading role in everyday life is played by traffic. The traffic is the main part in the chain of life. It should connect every other part of the chain. If this is achieved we get perfect look of this chain that will not only be useful, but will also look magnificent. But in the chain of life not always the parts are on their place, so the links in the chain don't always have the desired order, as well as into traffic that presents only one link into the chain of life.

The numbers that appear in the black statistics are terrifying, and the situation apocalyptic. These are not the numbers that we can accept, or to be proud of in any way. Therefore taking actions and precautions in order to build safe traffic system is never enough. The chain of life and traffic link that is the most repetitive link of that chain should never be without appropriate plan and program, on the contrary every link of that chain as well as every clutch that keeps links together, must always be regulated by appropriate rules and regulations that will, with no exceptions, always and everywhere will be respected. It is the only way to build appropriate traffic culture that will serve every participant into traffic no matter if it is active or passive participant into traffic. And only then the black statistic might not be that black or in ideal terms there will not be any black statistic.

Key words:

Traffic

Movement

Life

Chain

Culture

Main part:

In the beginning of this work it was mentioned about the importance of the traffic, but also about its curse. The goal of this work is to decrease the impact of that curse that places us in position to take serious precautions in order of higher safety in traffic. Building of the traffic culture is one step forward toward increased safety in traffic to a solid level, where the "curse" of increased traffic and speed will be insignificant.

Many people will say: "If roads had soul they will have a lot to say and a lot to teach us". Even the scariest scenes of the horror movies cannot be that terrifying, but accurate picture that is happening every day on the roads around the world. So we are getting to the question: Can we change that picture at least partially? Shore we can we also must, and not only for a moment and not only partially, but completely and to last. One of the basic and most important thing is building the traffic culture.

The traffic culture is a specific type of culture that should be respected by every participant into traffic. It is very important element of safety into traffic and takes more than only awareness about traffic rules and regulations and ability to drive a vehicle, but also a way of movement and behaving into traffic that will be appropriate to the general interests of the participants, behavior that will have everyone's safety as a priority. Today's educational system is obviously not achieving that goal, so we need different approach into building a traffic culture, and to include it into general culture of the population. To bring this into practice we need to locate target groups and to find appropriate approach for every group. As target groups we can detect:

1. Pupils from primary school

- Pupils from lower grades;

- Pupils from higher grades.

2. Pupils from high school

3. Other participants

- Pedestrians;

- Bike drivers and motor drivers;

- Vehicle drivers.

The traffic culture can be built by:

1. Organizing working classes;

2. Organizing competitions;

3. Organizing debates;

4. Organizing educational classes;

5. Organizing punitive lectures.

Targeted groups can be increased and modified, depending on the flows of the traffic situations.

Culture and ethics into traffic are learned from the yang age. The process of education is much easier then the process of changing the habits and culture into traffic. Therefore it is necessary to teach children about traffic culture from the yang age. That is the way to form a strong base to build a solid traffic culture. From experiences we see that we teach children too many things, but not how to participate into traffic, how to be safe and appropriate participants. Majority of the traffic participants are agree that traffic culture and ethics are not at the correct level, but almost all of them are looking for the omissions of others, forgetting that the traffic is a complex system, mosaic that we all take place in. Therefore the base has to be built for the youngest population includes not only pupils, but also for the preschool children. According to their age, for both groups, it is necessary to create working classes that include playing games to point to the basic behavior that needs to take place into everyday traffic.

I will point to one example that might look not very important, but will force us to realize that it is necessary to educate this group and that is crossing the road. Every parent and teacher teaches the children that the road is supposed to be crossed on the pedestrian crossing, but they are rarely taught how to do that. Don't forget that the children are most impulsive participants into traffic because of their level of awareness. We forget to tell children that to cross the road you need the pedestrian crossing and that is only one thing you need. Every child should learn that it should stop in front of the crossing, to take hands out of the pockets, to look left and right and, if there are no vehicles, without running to cross the road on the pedestrian crossing. We should admit that we forget about their age and assume that they already know that, but we make a big mistake. Another example that I want to point to, intended also to the drivers, is that whenever the ball is coming in front of the vehicle there is always a child running after the ball, unaware that the ball is on the street and a vehicle might also be on the same street at the same time which can lead to some very unwanted consequences. These are specific two elements that should determine the educational classes where children during games will learn the correct behavior. That is one brick in the base for future building of the traffic culture of the person.

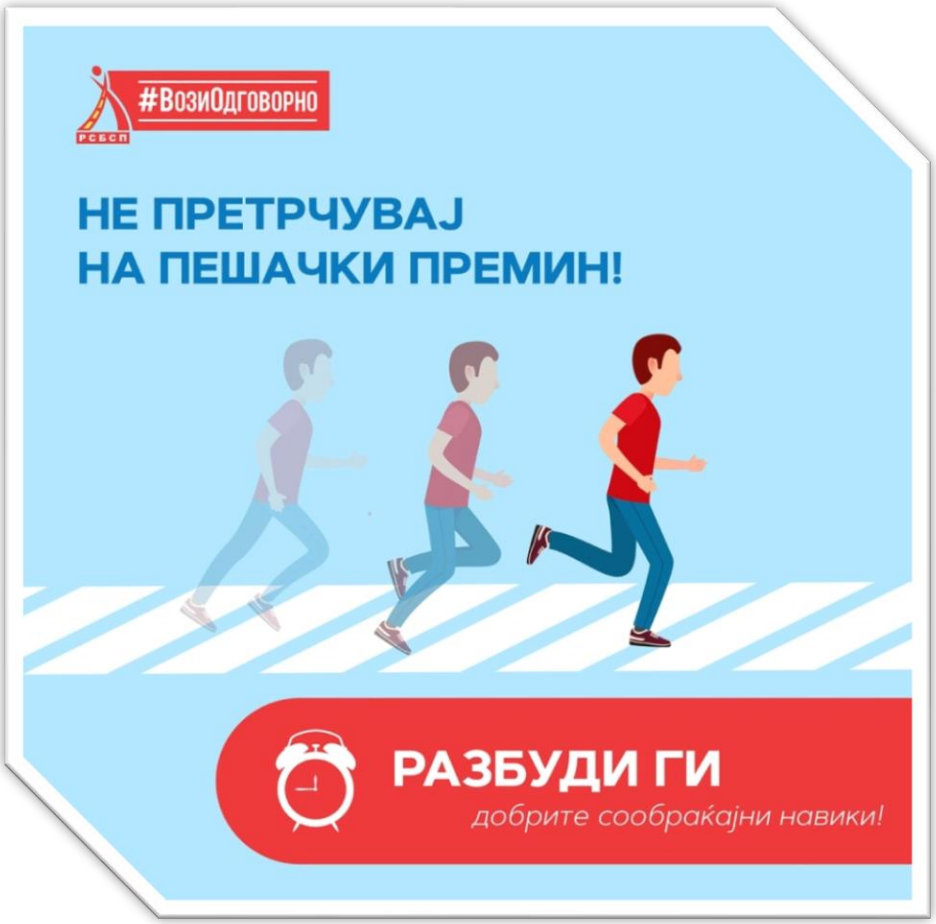


Figure 1.Incorrect crossing of the pedestrian crossing.

Pupils of the higher classes of the primary school need different approach when we talk about the traffic culture. What should we change for this group to increase their traffic culture? I think that the best we can do for this group is to point to the actions they take during driving the bike and when they participate into traffic as pedestrians, or as a group of pedestrians into the populated area as well as out of the populated areas. When we speak about driving the bike, we are thinking that this group of participants intends to show their driving skills in inappropriate way or to transport another child on the same bike without even thinking about safety measures. Second problem – movement of the pupils alone or in the group, in or out of the populated area – we can say that they don't know if they suppose to walk in a column, on the left or on the right side of the road when there is no sidewalk. With opening the debate discussions or organizing competitions with special attention on these problems, pointing why in the populated areas pedestrians should walk only where it is regulated to like sidewalks and pedestrians paths, out of the populated areas they should walk only on the left side of the road according to the direction of the vehicles no matter if he is alone or they are group, why the column can't be longer then 50m and similar regulations. We should also mention about the consequences of inappropriate bike driving and where it is allowed to drive a bike. Involving pupils in discussions they will reveal the answers by themselves and that is the only way to remember and to implement those conclusions. This should be enough for us to make bigger efforts.

Other groups of age are all into the group of other participants into traffic and they are in large number and in many varieties. Therefore most of the attention will be concentrated here, not because some group is more or less important.

The repetitive problems from previous years, caused by pedestrians, are:

- Crossing the roads on inappropriate place;
- Crossing the road inappropriate on the pedestrian crossing.

Every day we are witnessing irresponsibility of pedestrians crossing the road on places not predicted for them, even ourselves, to be honest, do the same. There is also very large number of pedestrians that abuses their right to cross the road on pedestrian crossing, and for example:

- Talking on a phone;
- Slowly crossing the road.

Pedestrians still dont understand that even on the pedestrial crossings they have to be carefull and responsible. Slowly moving accross, as well as talking on the phone is generating revolt for the drivers who are letting them cross, the contrentrarion of pedestrians is disturbed and the traffic jam is generated on both sides.

What can we do to decrease this problem and, at the same time, to increase the level of the traffic culture? For every situation caused by pedestrians it is necessary to apply educational, as well as punitive lectures. The traffic police should direct these participants to the educational-punitive lectures that will point to pedestrians to the consequences of their inappropriate behavior. Every pedestrian should receive on the same place invitation with precise date and time when to show up on such lectures. If someone is prevented from coming by any reason, should come to the next organized lecture. If someone don’t come at all should be assigned with penalty and pay reasonable amount of money or by socially-useful work.

Bike drivers and motor drivers are remaining the most vulnerable category of traffic participants. If we consider the part of the traffic that involves them and their “contribution” to the number of the killed and injured into traffic we will see that this number is very high compared to their part into traffic.

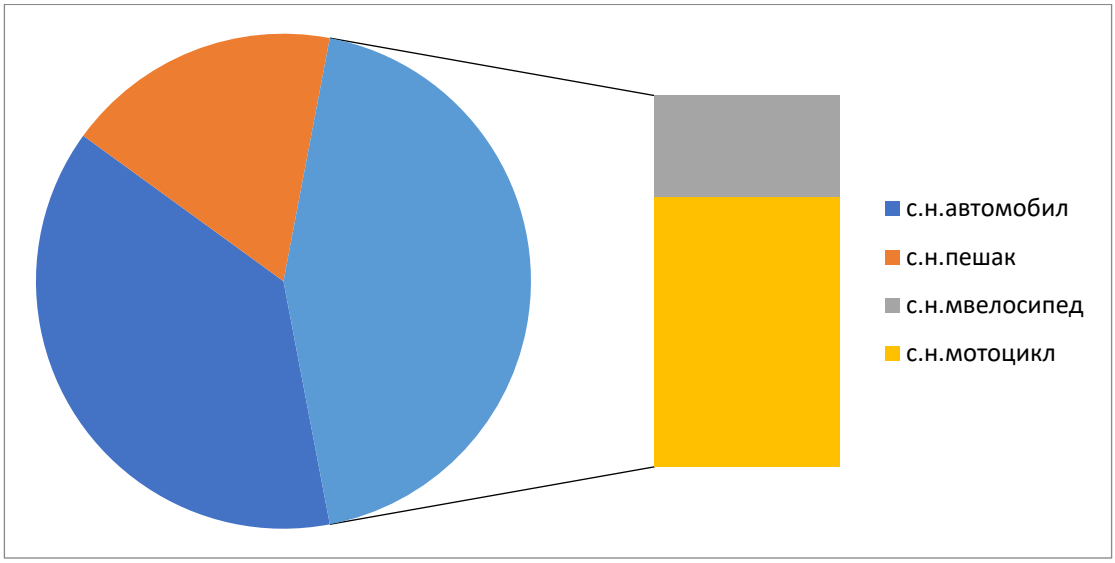


Diagram 1. Number of accidents into traffic

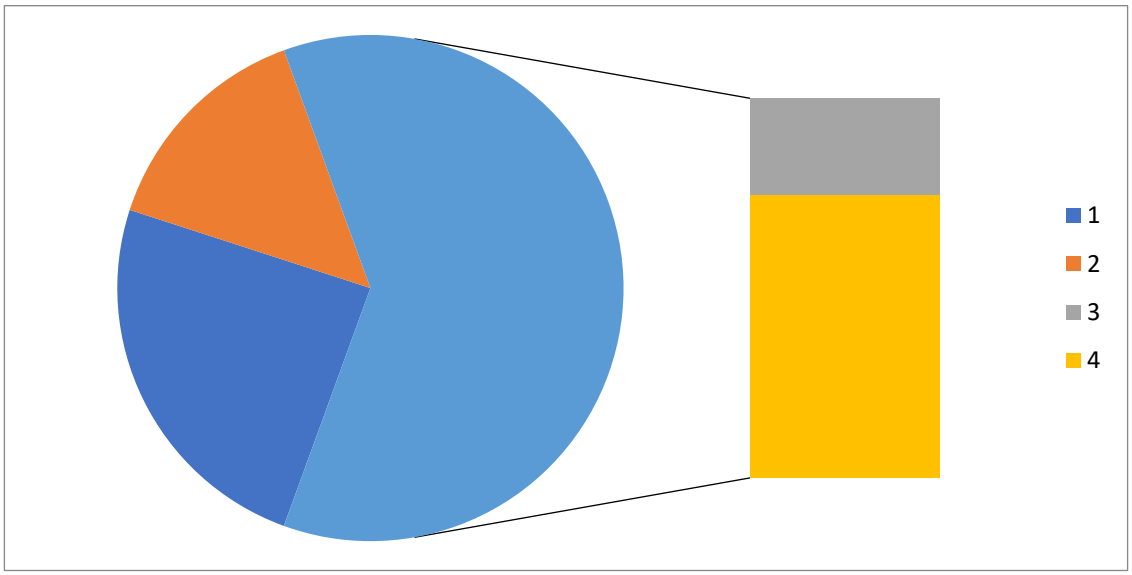


Diagram 2. Number of victims of the accidents

It is a fact that bike drivers and motor drivers are less protected compared to other drivers of the vehicles and therefore more exposed to the risks and dangers into traffic, but it is also a fact that the inappropriate traffic infrastructure is increasing the risk for their participation into traffic. There are several potentially dangerous situations that this group is causing which are not appropriately determined into regulation for safety in traffic.

It is obvious that their usurpation of the area not projected for them is the biggest problem caused by them and this is where action should take place. Ways can be identical as for the previous group, but the approach should be completely different. For this group educational classes will always follow the punitive lectures, they will be parallel without possibility of prolonging the terms for education and penalty.

Figure 2.Building the traffic culture for bike drivers and motor drivers.

The car traffic is undoubtedly in largest number and at the same time has largest potential for building best traffic culture. We should determine where the law is not specific, not complete or some parts can be forgotten aside by low, but they are affecting this group of participants.

Very often when we drive in a foreign country and come back to our country, we come with impressions about driver's behavior and culture there. Depending on where we had been driving, our impressions can be positive or negative. If impressions are positive we comment how the drivers there have better behavior than the drivers in our country, while home drivers have less culture and bad behavior. What is the reason that one driver is behaving different in different countries? One driver, very tragically, or maybe comical, is criticizing, but also making same mistakes. In these moments we have good opportunity to build traffic culture using every available methods including education, penalties, debates or something else. It is very important to increase the awareness of the drivers.

I will point to several examples that many of us witnessed during their travels in Europe, examples that might appear as not very significant but are very useful and can be applied everywhere.

First example is what they do with their hands, is it a cigarette, bottle of water, mobile phone or something else. Some countries have loose regulations about using mobile phone while driving if special device is used in order to have free hands, but they are missing psychological effect - while talking on the phone the attention is directed on the conversation not on the vehicle or the road ahead. I will not talk about other things that are involving busy hands as well as the distraction.

Second example is when we are in a column of vehicles, traffic jam or slow movement, most of the drivers will press on their horns that will solve nothing. Small number of drivers will turn on four flashing lights, especially the last one in the column. Very useful gesture that speaks about the driver's culture on high level that appears mostly into regulated countries, because four flashing lights are increasing the awareness for potential danger on the road ahead.

Third example is the situation where two lines are merging into one or the situation involving traffic jam during including into different traffic line, similar to the previous situation, known as situation "rajfeshlus". This is the situation where we have tense between vehicles trying to include and vehicles already driving on that line. If we want to built high level of traffic culture, in this situation you should let one vehicle to include and continue driving behind it. This example should be followed by the rest of the drivers. That is the only correct way, instead of bad words, pushing, tensions, hand gestures and nervous behavior, situation will be solved slowly but safely and in order one by one.

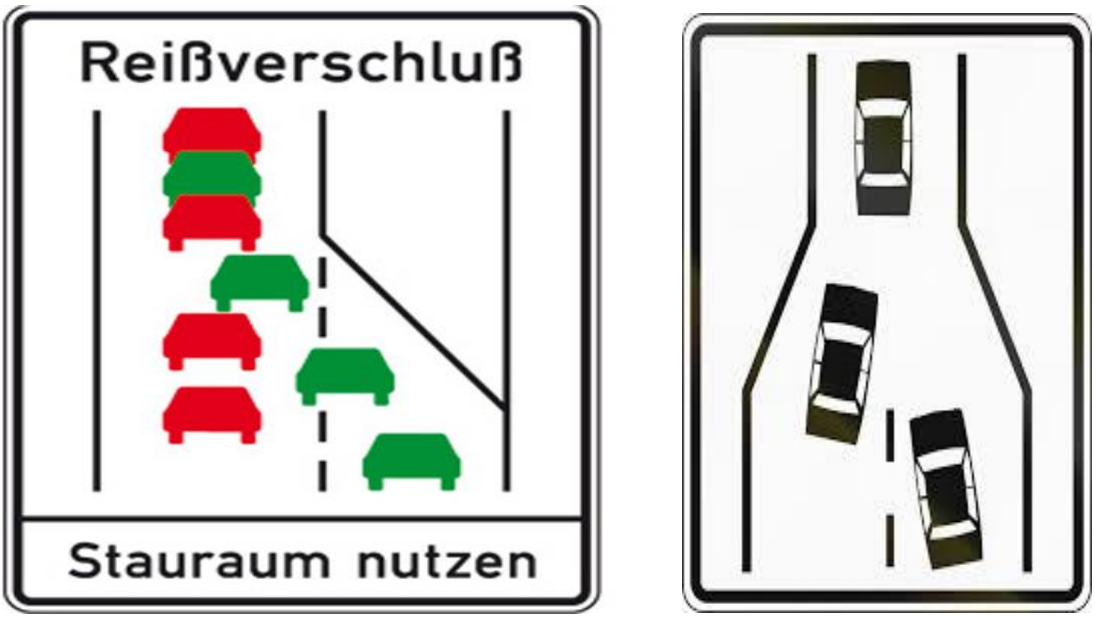


Figure 3. Building traffic culture for car drivers

There are many examples like these which no matter if they are not regulated by law can have large impact and are able to improve the level of traffic culture, also to contribute to safer traffic that we all tend to, but practice it very rear. It will be enough if these and some similar examples find their place into legal regulations of the law for safety in traffic on roads and to become part of the direction for driver training.

Conclusion:

At the end lets go back to the beginning – if we intend to build traffic culture, first every one of us, then as a group, community and country. Let's start with ourselves and always be an example and to be one step closer to the high level of traffic culture. "Bon-ton" is not only lecture for men in certain situations, its meaning and usage into traffic is almost never spotted and is very necessary. Building of the traffic culture is a process that never stops, can be built and improved in every segment of life, including traffic as a very significant part of life. This message is intended for every participant, for every group of participants, and

for every involved institution. Traffic is often called “plague of the 21st century” that places us in a situation to take drastic and very serious measures to change that. I hope this short text will serve the educational goals and finally start to throw away negative and to implement positive experiences from different situations and different countries all over the world. To be critical, but also self-critical, because traffic culture is manifested into the relation of the driver and driver, driver and traveler, driver and pedestrian, but also the other way around; driver and the animals that will show on the road, driver and the road and environment, driver and the rules and regulations, but also driver and himself. That is the only way to build traffic culture that will allow every trip to be pleasant, that is the only way for the roads to tell stories with happy ending.

Претходно соопштение

ŠKOLA ZA CESTOVNI PROMET, ZAGREB

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EU projekt „Driver Exchange Skill Competition“ – DESCO

Sažetak:

Škola za cestovni promet iz Zagreba nositelj projekta „Driver Exchange Skill Competition“ - DESCO u sklopu programa Europske unije Erasmus+. Partneri u projektu su osim Škole za cestovni promet iz Zagreba i Kouvola Region Vocational College KSAO multidisciplinarna strukovna ustanova smještena u Kouvoli (Finska) Saobraćajno tehnička škola iz Zemuna (Srbija), i Lycée des métiers Maréchal Leclerc de Hauteclocque iz Saint Jean de la Ruelle (Francuska).

Projekt povezuje strukovne škole iz sektora promet i logistika koje obrazuju učenike za zanimanje vozač motornog vozila. Njime se ojačava povezanost strukovnog obrazovanja u sektoru prometa i logistike i tržišta rada te osigurava kvalitetno obrazovanje u zanimanju vozač motornih vozila kroz prijenos i diseminaciju znanja, vještina i dobre prakse među strukovnim školama. Projekt Driver Exchange Skill Competition“ - DESCO trebao bi doprinijeti povećanju kvalitete i atraktivnosti strukovnog obrazovanja i osposobljavanja u području prometa i logistike razmjenom znanja i iskustava između partnera u projektu. Kao dugoročnu mjeru koja bi doprinosila poboljšanju i unaprjeđenju kvalitete te privlačnosti obrazovnog programa vozač motornog vozila, projektom želimo osmisliti sustav razmjene iskustava i znanja učenika u formi natjecanja.

Ključne riječi:

- Program za cjeloživotno učenje – Program Erasmus+

- Obrazovanje vozača motornih vozila

EU projekt „Driver Exchange Skill Competition“ - DESCO

1. O projektu

Projekt povezuje strukovne škole iz sektora promet i logistika koje obrazuju učenike za zanimanje vozač motornog vozila. Projektom želimo ojačati povezanost strukovnog obrazovanja u sektoru prometa i logistike i tržišta rada te osigurati kvalitetno obrazovanje u zanimanju vozač motornih vozila kroz prijenos i diseminaciju znanja, vještina i dobre prakse među strukovnim školama. Kao dugoročnu mjeru koja bi doprinosila poboljšanju i unaprjeđenju kvalitete te privlačnosti obrazovnog programa vozač motornog vozila, projektom želimo osmisliti sustav razmjene iskustava i znanja učenika u formi natjecanja koje bi se odvijalo jednom godišnje. Također razviti će se održivo partnerstvo za uspostavu i daljnji razvoj nacionalnih, regionalnih i sektorskih ustanova za natjecanje u vještinama kao oblik povećanja privlačnosti, atraktivnosti i izvrsnosti strukovnog obrazovanja i osposobljavanja za zanimanje vozač motornog vozila.

Projekt je usmjeren na sljedeće ciljne skupine:

1. Učenici iz partnerskih škola koji se školuju za zanimanje vozač motornog vozila su direktni korisnici projekta te će on na njih imati direktan učinak: učenici će kroz projektne aktivnosti steći dodatna znanja i vještine, a kroz sustav natjecanja će dobiti uvid koliko je vozački posao zanimljiv i tražen na tržištu rada te biti dodatno motivirani da se nakon školovanja zaposle kao vozači. Učenici će, zahvaljujući novim znanjima koja su stekli njihovi nastavnici, imati veća i potpunija teoretska i praktična znanja neophodna za obavljanje njihove buduće djelatnosti.
2. Nastavnici iz partnerskih škola koji su uključeni u obrazovanje za zanimanje vozač motornog vozila bit će uključeni u sve provedbene faze projekta te će on na njih imati direktan učinak. Razmjena iskustava i dobre prakse između nastavnika te ciljani specifični treninzi doprinijet će poboljšanju nastavničkih kompetencija te učinkovitijoj obuci učenika.
3. Ciljna skupina su i budući učenici kojima to zanimanje postaje sve manje privlačno te ga treba kroz razne diseminacijske aktivnosti učiniti zanimljivim mladoj populaciji. Promocija zanimanja neće biti usmjerena samo na mušku populaciju već i na motiviranje djevojaka da se školuju za vozačice. Učenici završnih razreda osnovne škole bit će pozvani na natjecanje na kojem će sudjelovati i djevojke.

4. Nezaposlene osobe koje kroz program prekvalifikacije mogu steći kvalifikaciju za zanimanje vozač bit će također obuhvaćene diseminacijom.
5. Sve projektne aktivnosti u konačnici su usmjerene gospodarstvu jer projektom želimo ostvariti sljedeće učinke: spremnije i lakše uključivanje učenika na tržište rada, kvalitetnije obrazovanje za zanimanje vozača i veći interes motiviranih budućih učenika.

Predviđeno trajanje projekta je 27 mjeseci.

U prvoj fazi projekta svaka škola partner obvezala bi se preuzeti jedno područje u prijevoznom procesu te bi iz tog područje organizirala stručno usavršavanje kolega iz ostalih partnerskih škola kako bi se podigla razina znanja i informiranosti o specifičnostima prijevoznog procesa u pojedinim državama EU.
U drugoj godini trajanja projekta partneri će za učenike koji se obrazuju za vozača motornog vozila organizirati natjecanje u vještinama i znanjima na način da učenici pokažu sva znanja iz područja koja su predviđena temom za tu godinu (tema iz područja prijevoznog procesa ima onoliko koliko ima partnera na projektu).

2. Partneri na projektu

Svaka škola partner donosi u projekt vrijedna specifična znanja i iskustva te vrlo razgranatu mrežu partnera koja omogućuje kvalitetnu diseminaciju projektnih rezultata:

Škola za cestovni promet je nositelj projekta. Škola pruža usluge edukacije vezanih uz odgoj i obrazovanje učenika i odraslih za stjecanje srednje stručne spreme i stjecanje znanja i sposobnosti za rad i nastavak školovanja, odnosno stjecanje kompetencija potrebnih za dobivanje strukovnih kvalifikacija za cestovni promet i logistiku. Škola za cestovni promet će organizirati za nastavnike trening na temu telematika u cestovnom prometu.

Kouvola Region Vocational College KSAO multidisciplinarna je strukovna ustanova smještena u Kouvoli. Kouvola Region Vocational College KSAO će organizirati za nastavnike trening vožnje u zimskim uvjetima.

Saobraćajno tehnička škola iz Zemuna je parnterska ustanova koja do sada nije sudjelovala u Erasmus+ programu. Škola predsjeda strukovnom organizacijom „Zajednica saobraćajnih škola Republike Srbije“ (www.zss.edu.rs) koja okuplja sve škole iz područja prometa i prometa u Srbiji. Organizacija djeluje kao organizator Državnog natjecanja škola u području prometa i logistike. Natjecanje se odvija jednom godišnje, a učenici se natječu u teoretskom znanju i praktičnim vještinama vožnje. Partner će predstaviti srpski obrazovni sustav te sustav državnog natjecanja u sektoru promet i logistika. Osim toga, organizirat će za nastavnike trening iz područja sigurnosti i osiguranja tereta.

Lycée des métiers Maréchal Leclerc de Hauteclocque iz Saint Jean de la Ruelle, France upoznat će nas s francuskim obrazovnim sustavom, posebno s kurikulom za vozača motornog vozila. Škola je članica NETINVET-a - europske mreže od 72 centra za obuku i preko 150 povezanih tvrtki iz 8 zemalja: Belgije, Francuske, Njemačke, Italije, Nizozemske, Portugala, Rumunjske i Španjolske. Za svaku od ovih zemalja pridružena su nadležna tijela (ministarstva, nacionalne agencije, profesionalne / trgovinske organizacije) kako bi se potaknula i podržala uspostava mreže. Partner će organizirati trening za nastavnike iz dva specifična područja: posebni postupci logističkog pristupa za prijevoz opasnih tvari i trening upravljanja viličarom.

3. Projektne aktivnosti učenja, podučavanja i osposobljavanja

3.1. Vožnja u zimskim uvjetima (Kovuola, Finska)

Predmet transnacionalne aktivnosti učenja je proširenje znanja, vještina i kompetencija u područjima:

1. stjecanje vještina pravilne ugradnje zimske opreme na vozilo
2. vještina sigurne vožnje u zimskim uvjetima i upravljanja vozilom na zaleđenoj površini
3. stjecanje znanja o postupcima u iznimnim i opasnim situacijama tijekom vožnje zimi

Sudionici treninga su bili po 3 profesora strukovnih škola iz svake partnerske škole, od kojih najmanje jedan vozač instruktor (trener) vožnje.

Slika 1. Prikaz uvodnog predavanja u edukaciju

Od 10. do 12. veljače 2020. održana je edukacija Vožnje u zimskim uvjetima u organizaciji partnerske škole Kouvola Region Vocational College KSAO iz Finske.
Sudionicima edukacije je predstavljen grad Kouvola i njegove znamenitosti te sustav školovanja u Finskoj. Također im je predstavljena škola domaćin Kouvola Regija Vocational College koja je multidisciplinarna ustanova. Školu pohađa oko 3.000 mladih i odraslih studenata. U strukovnom obrazovanju nude više od 60 različitih strukovnih srednjoškolskih, daljnjih strukovnih i specijalističkih strukovnih kvalifikacija. U stručnom dijelu je na poligonu organizirana edukacija vožnje u zimskim uvjetima. U cilju vježbe je odrediti zaustavni put kočenja ovisno o brzini vožnji i podlozi kočenja. Vježba je odrađivana u osobnim i teretnim vozilima.

Slika 2. Vožnja po zaleđenoj površini

Slika 3. Postavljanje lanaca

U centru za obrazovanje odraslih i logističkom odjelu su prezentirani su strojevi, oprema, alati i načini za sigurniju provedbu vožnje u zimskim uvjetima. Neka od rješenja je OnSpot sustav koji podrazumijeva automatsko aktiviranje lanaca iz kabine vozača. Kotač je opremljen s nekoliko lanaca koji se spuštaju prema pogonskim kotačima kako bi se povećala vučna sila. Sustav se uključuje samo kada je to potrebno pri brzini od 35– do 50 km/h bez zaustavljanja vozila. OnSpot je jednostavan i pouzdan sustav. Na ledenim i skliskim cestama vozač aktivira automatske lance guma na prekidaču na nadzornoj ploči. Jedan od sustava za sigurniju vožnju u zimskim uvjetima je i rasipač pijeska. Rasipač pijeska trajno je montiran na svakoj strani vozila i sastoji se od spremnika za pijesak i sustava za dopremanje. Sustavom ručno upravlja vozač i dovodi pijesak ispred pogonskih kotača kako bi povećao vuču.

Prezentirano je i postavljanje lanaca na pogonske kotače teretnog vozila. Nakon demonstracije organizatora, sudionici su također odradili vježbu postavljanja i skidanja lanaca s kotača. U teorijskom dijelu obuke vezane za zimske uvjete vožnje te zimsku opremu su povezana stečena praktična i teorijska znanja i vještine.

U logističkom centru sudionici su imali priliku isprobati simulatore vožnje viličara i kamiona. Simulatori vožnje kamiona koriste se obuku kandidata. Na viličarima sudionici su obavili prekrcaj tereta, te se kroz taj dio upoznali sa sigurnim načinom rada viličarem. Prezentiran je logistički sustav poslovanja u gradu Kouvoli. Kouvola ima logistički idealnu lokaciju sa željezničkim vezama sa svim glavnim točkama i

glavnim cestovnim vezama u šest smjerova. Godine 2015., Kouvola je rangirana kao najbolji logistički centar u sjevernoj Europi sa gotovo 2000 zaposlenika u tom sektoru. Grad je logističko središte između Azije i Europe te nudi brojne poslovne mogućnosti u skladištenju i distribuciji.
Organiziran je posjet helikopterskom odjelu. Uz razgledavanje helikoptera i zrakoplova predstavljen je i obrazovni sustav za učenike koji se školuju za zrakoplovne mehaničare. Odgovornosti uključuju održavanje, popravak i modifikaciju zrakoplova u servisima za civilne zrakoplove i zrakoplovnu industriju.

3.2. Telematika (Zagreb, Hrvatska)

Predmet transnacionalne aktivnosti učenja je proširenje znanja, vještina i kompetencija u područjima:

1. Modeli, alati i metode za podučavanje novih tehnologija, digitalnih sadržaja i komunikacijskih vještina;
2. primjena suvremenih informacijskih i telekomunikacijskih tehnologija za povećanje atraktivnosti strukovnog obrazovanja;
3. stjecanje dodatnih psiholoških znanja i komunikacijskih vještina u svrhu primjene istih u prometu

Sudionici treninga su najmanje 3 profesora strukovnih škola iz svake partnerske škole.

Slika 4. Prikaz uvodnog predavanja u edukaciju

Od 13. do 15.10.2020. u virtualnom obliku (ZOOM) održan trening i edukacija u organizaciji Škole za cestovni promet na temu Telematika.
Na edukciji odnosno projektnoj aktivnosti učenja, podučavanja i osposobljavanja prezentiran je SELFIE alat za samoprocjenu upotrebe digitalnih tehnologija za učenje i poučavanje u školi kako i rezultati provedene

ankete u Školi za cestovni promet. Gostujući predavač iz tvrtke CVS Mobile je prezentirao Fleet management CVS Molile sustav kao dio globalnog telematskog rješenja te je kroz primjere prikazao funkcionalnost navedene aplikacije. Sudionici su upoznati i sa novim zakonskim okvirima radnog vremena vozača i vremena odmora vozača u međunarodnom prometu. Prezentirana je virtulana tvrtka za virtualno praćenje prometa kroz upotrebu napredne telematike u cestovnom prometu, a na radionici su prisutni uvježbavali primjenu korištenja telematičkog sustava. Upoznati su sa mogućnostima telematičkog sustava za nadzor vozača i kako sustav utječe na rad profesionalnog vozača uz obuku nastavnika o korištenju telematike (komunikacija, slanje ruta i naredbi, primjena dokumentacije te unos i evidencija troškova) Objašnjen je i utjecaj telematike na sigurnost prometa. upoznavanje mogućnosti telematičkog sustava za nadzor vozača i kako sustav utječe na rad profesionalnog vozača.

4. Zaključak

Rad na projektu se nastavlja kroz projektne aktivnosti učenja, podučavanja i osposobljavanja u i to za područja iz područja sigurnosti i osiguranja tereta koji će se održati u Zemunu (Srbija) u organizaciji Saobraćajno tehnička škola iz Zemuna: te postupci logističkog pristupa za prijevoz opasnih tvari i trening upravljanja viličarom koji će se održati u Saint Jean de la Ruelle (Francuska) u organizaciji Lycée des métiers Maréchal Leclerc de Hauteclocque iz Saint Jean de la Ruelle.

Planirana je i za učenike koji se obrazuju za vozača motornog vozila organizacija natjecanja u vještinama i znanjima na način da učenici pokažu sva znanja iz područja njihovog obrazovanja koje će se održati u Zagrebu (Hrvatska) u organizaciji Škole za cestovni promet iz Zagreba.

Literatura

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ROAD TRAFFIC SCHOOL, ZAGREB

Authors:

Tomislav Ćurković, grad. traffic eng.-Prof. advisor

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Škola za cestovni promet

EU projekt „Driver Exchange Skill Competition“ – DESCO

Summary:

The Road Traffic School from Zagreb is the holder of the project "Driver Exchange Skill Competition" - DESCO within the European Union Erasmus + program. In addition to the Road Traffic School from Zagreb and Kouvola Region Vocational College KSAO, a multidisciplinary vocational institution located in Kouvola (Finland), the project partners are the Traffic Technical School from Zemun (Serbia) and the Lycée des métiers Maréchal Leclerc de Hauteclocque from Saint Jean de la Ruelle (France).

The project connects vocational transport and logistics schools educating students for the profession of motor vehicle driver. It strengthens the connection of vocational education in the transport and logistics sector with the labor market, ensuring the quality of education in the profession of motor vehicle driver through the transfer and dissemination of knowledge, skills and good practice among vocational schools. The Driver Exchange Skill Competition project - DESCO should contribute to the increase of the quality and attractiveness of vocational education and training in the field of transport and logistics by exchanging knowledge and experiences among project partners. As a long-term measure contributing to the improvement and enhancement of the quality and attractiveness of the motor vehicle driver educational program, the project aims to design a students experiences and knowledge exchange system in the form of competitions.

Keywords:

- Lifelong Learning Program - Erasmus Program +

- Motor vehicle drivers education

EU projekt „Driver Exchange Skill Competition“ - DESCO

1.About the project

The project connects vocational transport and logistics schools educating students for the profession of motor vehicle driver. The project aims to strengthen the connection of vocational education in the transport and logistics sector with the labor market providing quality education in the profession of motor vehicle driver through the transfer and dissemination of knowledge, skills and good practice among vocational schools. As a long-term measure contributing to improvement and enhancement of the quality and attractiveness of the motor vehicle driver educational program, the project aims to design a students experiences and knowledge exchange system in the form of competitions that will take place once a year. A sustainable partnership will also be developed for the establishment and further development of national and regional skills' competition institutions in order to increase the attractiveness and excellence of vocational education and training for the profession of motor vehicle driver.

The project aims at the following target groups:
1. Students from partner schools studying for the profession of motor vehicle driver are direct beneficiaries of the project and it will have a direct effect on them: students will gain additional knowledge and skills through project activities, and through the competition system they will gain insight into how interesting driving is and wanted after in the labor market and be further motivated to take up employment as drivers after school. Thanks to the new knowledge acquired by their teachers, students will have greater and more complete theoretical and practical knowledge necessary to perform their future activities.

2. Teachers from partner schools involved in motor vehicle driver education will be involved in all implementational phases of the project and will have a direct impact on them. The exchange of experiences and good practice between teachers and targeted specific trainings will contribute to the improvement of teacher competencies and more effective students' trainings.

3. The target group is also future students to whom this profession is becoming less and less attractive and should be made interesting to the young population through various dissemination activities. The promotion of the profession will not only focus on the male population but also on motivating girls to train for drivers. Elementary school students will be invited to a competition in which girls will also participate.

4. Unemployed persons who can obtain a driver's qualification through the retraining program will also be covered by dissemination.

5. All project activities are ultimately focused on the economy because the project aims to achieve the following effects: more willing and easier inclusion of students in the labor market, better education for the profession of the motor vehicle driver and greater interest of motivated future students.

The estimated duration of the project is 27 months.
In the first phase of the project, each partner school will be obliged to take over one area of the transport process and organize a professional training in that specific transport process for the colleagues from other

partner schools in order to raise the level of knowledge and information about the specifics of the transport process in individual EU countries.
In the second year of the project, the partners will organize a skills and knowledge competition for students studying to be a motor vehicle driver in such a way that students show all knowledge in the area predicted by the theme for that year. (there will be as many themes from transport process as there are project partners).

2. Project partners

Each partner school brings valuable specific knowledge and experience to the project, as well as a very extensive network of partners that enables the quality of project results dissemination:

The Road Traffic School is the project holder. The school provides educational services related to the upbringing and education of students and adults for the acquisition of high school education, the acquisition of knowledge and skills needed for work or further education, or the acquisition of competencies needed to obtain professional qualifications for road transport and logistics. The Road Traffic School will organize a teacher training on the topic of telematics in road traffic.

Kouvola Region Vocational College KSAO is a multidisciplinary vocational institution located in Kouvola. Kouvola Region Vocational College KSAO will organize teachers' driving training in winter conditions.

The Traffic Technical School from Zemun is a partner institution that has not participated in the Erasmus + program so far. The school leads the professional organization "Association of Traffic Schools of the Republic of Serbia" (www.zss.edu.rs), which brings together all schools in the field of traffic and logistics in Serbia. The Association acts as the organizer of the National School Competition in the field of transport and logistics. The competition takes place once a year, and students compete in theoretical knowledge and practical driving skills. The partner will present the Serbian educational system and the system of state competition in the transport and logistics sector. In addition, they will organize a teachers' training in the field of security and cargo insurance.

The Lycée des métiers Maréchal Leclerc de Hauteclocque from Saint Jean de la Ruelle, France will introduce us to the French educational system, especially the curriculum for the motor vehicle driver. The school is a member of NETINVET - a European network of 72 training centers and over 150 affiliated companies from 8 countries: Belgium, France, Germany, Italy, the Netherlands, Portugal, Romania and Spain. Competent authorities (ministries, national agencies, professional / trade organizations) are associated to each of these countries in order to encourage and support the establishment of the network. The partner will organize a teachers' training in two specific areas: special logistical access procedures for the transport of hazardous substances and forklift management training.

3. Project activities of learning, teaching and training

3.1. Winter driving (Kovuola, Finland)

The subject of transnational learning activity is the expansion of knowledge, skills and competencies in the areas of:

1. acquisition of skills needed for proper installation of winter equipment on the vehicle
2. the skill of safe driving in winter conditions and driving a vehicle on a frozen surface
3. acquiring knowledge about the procedures in exceptional and dangerous situations while driving in winter

The training participants were 3 vocational school teachers from each partner school, at least one of them a driving instructor.

Slika 1. Presentation of the introductory lecture in education

From the 10th to 12th February 2020, a Winter Driving training was organized by the partner school Kouvola Region Vocational College KSAO from Finland.

The training participants were introduced to the city of Kouvola and its sights, as well as the educational system in Finland. They were also introduced to the host school Kouvola Region Vocational College which is a multidisciplinary institution. The school is attended by about 3,000 young and adult students. In vocational education, they offer more than 60 different vocational high school, further vocational and specialised vocational qualifications. In the professional part, driving training in winter conditions was organized on the training ground. The purpose of the exercise is to determine the stopping braking distance according to the driving speed and the braking surface. The exercise was performed in cars and trucks.

Slika 2. Driving on an icy surface

Slika 3. Placing chains

The Adult Educational Center and the logistics department presented machines, equipment, tools and ways to make driving safer in winter conditions. One of the solutions is the OnSpot system, which involves the automatic activation of chains from the driver's cabin. The wheel is equipped with several chains descending towards the drive wheels to increase traction. The system switches on only when required at speeds of 35 to 50 km / h without stopping the vehicle. OnSpot is a simple and reliable system. On icy and slippery roads, the driver activates automatic tire chains using the switch on the dashboard. One of the systems for safer driving in winter conditions is the sand spreader. The sand spreader is permanently mounted on each side of the vehicle and consists of a sand tank and a delivery system. The system is manually operated by the driver and brings sand in front of the drive wheels to increase traction.

The installation of chains on the drive wheels of the cargo truck was also presented. After the demonstration of the organizer, the participants also did an exercise of setting up and removing the chains from the wheels. In the theoretical part of the training related to winter driving conditions and winter equipment, the acquired practical and theoretical knowledge and skills are connected.

At the logistics center, participants had the opportunity to try out the forklift and truck driving simulators. Truck driving simulators are used to train candidates. At the forklifts, the participants reloaded the cargo, and through that part they got acquainted with the secure forklift management. The logistics business system in the city of Kouvola was also presented. Kouvola has a logistically ideal location with rail links to all major points and major road links in six directions. In 2015, Kouvola was ranked as the best logistics center in

Northern Europe with almost 2,000 employees in the sector. The city is a logistics center between Asia and Europe and offers numerous business opportunities in warehousing and distribution.
A visit to the helicopter department was organized. In addition to the helicopters and airplanes sightseeing, an educational system for students studying to become aircraft mechanics was presented. Responsibilities include aircraft maintenance, repair and modification in services for civil aircraft and aerospace industry.

3.2. Telematics (Zagreb, Croatia)
The subject of transnational learning activity is the expansion of knowledge, skills and competencies in the areas of:

1. models, tools and methods for teaching new technologies, digital content and communication skills;
2. application of modern information and telecommunication technologies to increase the attractiveness of vocational education;
3. acquisition of additional psychological knowledge and communication skills for the purpose of their application in traffic

Participants in the training are at least 3 vocational school teachers from each partner school.

Slika 4. Presentation of the introductory lecture

From the 13th to the 15th October 2020, a training and education was held in virtual form(ZOOM), organized by the Road Traffic School on the topic of Telematics.
During the education or project activity of learning, teaching and training, the SELFIE tool for self-assessment of the use of digital technologies for learning and teaching in school was presented, as well as the results of a survey conducted at the Road Traffic School. A guest lecturer from CVS Mobile presented the Fleet management CVS Mobile system as part of a global telematics solution and the functionality of this application through examples. Participants were also introduced to the new legal framework of drivers' working hours and rest periods in international traffic. A virtual company for virtual traffic monitoring was

presented through the use of road traffic advanced telematics, and at the workshop the participants practiced the use of the telematics system. They are acquainted with the possibilities of the telematics system for driver supervision and how the system affects the work of a professional driver as well as the teacher training on the use of telematics (communication, sending routes and commands, applying documentation and entering and recording costs). The effects of telematics on the traffic safety were also explained. They got acquinted with the possibilities of a telematics driver monitoring system and how the system affects the work of a professional driver.

4. Conclusion

Work on the project continues through project activities of learning, teaching and training in the field of safety and cargo insurance which will be held in Zemun (Serbia) and organized by the Traffic Technical School from Zemun. As well as in the field of procedures of logistical approach for transport of dangerous goods, a forklift management training will be held in Saint Jean de la Ruelle (France) and organized by the Lycée des métiers Maréchal Leclerc de Hauteclocque from Saint Jean de la Ruelle.
An organization of skills and knowledge competition is also planned for students educating themselves for motor vehicle drivers in such a way that students show all their knowledge in the field of their education. It will be held in Zagreb (Croatia) and organized by the Road Traffic School from Zagreb.

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PROMETNA ŠKOLA U RIJECI

Jože Vlahovića 10

Marijeta Mašić, prof.

Alen Panić, struč. spec. ing. traff

PROMOCIJA U OBRAZOVANJU

Sažetak

Promocija predstavlja dio marketinških aktivnosti. U praksi se pojam marketinga i promocije često suprotstavljaju kao sinonimi, no među njima postoje velike razlike. Marketing integrira sve aktivnosti koje počinju od samog stvaranja proizvoda ili usluge, distribucije, promocije i prodaje krajnjim korisnicima. Promotivnim aktivnostima nastoji se ostvariti kontakt između korisnika i pružatelja usluge, odnosno razviti osviještenost o postojanju obrazovne ustanove i njenih obrazovnih programa. Sve marketinške aktivnosti neophodno je prilagoditi primarnoj tržišnoj niši, odnosno ciljanoj publici, pritom ne zaboravljajući da u redovnom obrazovanju ciljana publika nisu samo potencijalni novi učenici, već i njihovi roditelji. Logotip predstavlja centralni vizualni identitet. Njegovim precizno definiranim karakteristikama može se doprinijeti boljoj percepciji ustanove sa strane potencijalnih krajnjih korisnika.

Ključne riječi: marketing, obrazovanje, logotip, promocija, prometna škola.

1.UVOD

Promotivne aktivnosti predstavljaju srž marketinga, prvenstveno zbog njihove uloge u stvaranju kontakta između prodavatelja i kupca ili, u slučaju ovog stručnog rada, između obrazovne ustanove i učenika odnosno, polaznika obrazovanja odraslih.

Promotivne aktivnosti mogu se manifestirati kroz različite načine, a najčešće se koriste modeli oglašavanja, osobne prodaje, sajmova, unaprjeđenja prodaje i sl. U ovom radu prikazati ćemo kako promjena logotipa može utjecati na vizualni identitet obrazovne ustanove, i to na primjeru Prometne škole u Rijeci.

2.TEMELJNE ODREDNICE PROMOCIJE U MARKETING MIKSU

Marketing predstavlja složen sustav različitih čimbenika s osnovnim ciljem plasiranja proizvoda ili usluge do krajnjih potrošača. Takav sustav uključuje istraživanje tržišta, donošenje odluke o proizvodnji, način komunikacije s potencijalnim korisnicima, kanale distribucije, promotivne aktivnosti i prodaju. Pojam marketinga često se interpretira kao sinonim za promotivne aktivnosti, kao što su oglašavanje, sajmovi, kampanje i sl., no, promocija je samo jedan segment marketing miksa, čiji je zadatak ostvariti kontakt s krajnjim korisnicima i potaknuti njihovu odluku i kupnji proizvoda ili usluge. Promocija u obrazovnom sustavu predstavljat će okosnicu ovog kritičkog rada. Obrazovni sustav dio je kvartarnog sektora.

2.1.Segmentacija tržišta

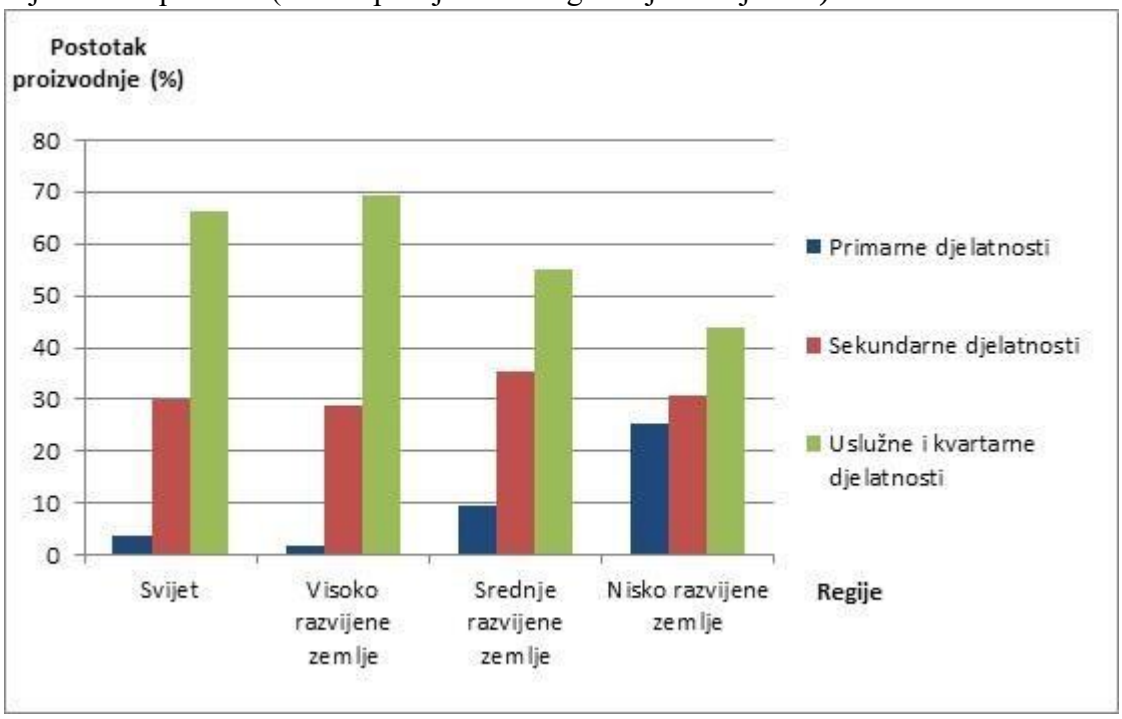
Tržište se sastoji od kupaca, a kupci se razlikuju na mnogo načina. Stoga, tržišta mogu biti segmentirana na brojne načine. Segmentacija tržišta predstavlja nastojanje da se poveća preciznost određene tvrtke ili ustanove u odabiru ciljanog tržišta. Ono se može izvesti na četiri različite razine, a to su generalizirani segmenti, tržišne niše, lokalno područje ili pojedinac.

Tržišni segmenti su obično velike prepoznatljive grupe unutar tržišta. Kada se tržišne niše nastoje identificirati, najčešće se dijele u podsegmente koji imaju određene zajedničke značajke.

2.2.Marketing usluga

Proizvod ili usluga, u samom kontekstu marketinga, ne predstavljaju različite pojmove u samom planiranju marketinških aktivnosti, jer je obrazac planiranja svih aktivnosti do prodaje krajnjim

potrošačima jednak. No, ono što karakterizira temeljnu razliku proizvoda i usluge je prisutnost fizičke komponente. Kod usluge je naglašena njena neopipljivost, no rijetko koja usluga ima isključivo nematerijalnu komponentu (kao šti primjerice usluge savjetovanja i sl.).



Komparacija kvartarnog sektora s ostalim sektorima u svijetu

Kao što je navedeno, prosvjeta je dio kvartarnog sektora. Na prethodnoj slici prikazano je koliki dio zauzima kvartarni sektor u odnosu na ostale sektore, uzevši u obzir da se kvartarni sektor gotovo isključivo sastoji od uslužnih djelatnosti. Kada govorimo o pružanju obrazovnih usluga, njihova specifičnost očituje se kroz to da se proizvodnja i korištenje odvija istovremeno. Dakle, tijekom samog nastavnog procesa učenici redovnih programa ili polaznici programa obrazovanja odraslih i nastavnici paralelno sudjeluju u stvaranju i korištenju usluge. Kod ovakvih oblika usluga izrazito je prisutna subjektivnost u evaluaciji kvalitete pružene usluge sa strane krajnjih korisnika.

3.UTJECAJ LOGOTIPA NA KORISNIKOVU PERCEPCIJU OBRAZOVNE USTANOVE

Različiti čimbenici u okruženju obrazovne ustanove direktno utječu na to kolika će biti njena zapaženost na tržištu i u percepciji širih korisnika, a među njima se mogu izdvojiti stopa nataliteta, socijalni status, trendovi na tržištu rada i sl.

3.1.Logotip i brandiranje

Logotip predstavlja vizualni identitet određenog branda, čija se adekvatna konstrukcija itekako može odraziti na njegov razvoj. Brand, kao sustav složenih perceptivnih jedinica, predstavlja sinergiju različitih čimbenika koji identificiraju neki proizvod ili uslugu. Navedeno se odnosi na logotip određene firme ili ustanove, viziju i misiju, strateški pristup tržištu, dizajn, vrijednost i sl.

Robna marka predstavljala bi uži pojam od pojma branda, zbog toga što ona predstavlja vizualni identitet nekog entiteta i polazna je točka diferencijacije proizvoda ili usluge od ostalih srodnih proizvoda ili usluga. Postupak diferencijacije složen je postupak, koji se ne može svesti isključivo na elementarne karakteristike proizvoda ili usluge, već predstavlja čitav niz činitelja kojima se želi naglasiti sveukupna različitost od direktne konkurencije.

Brandiranje, kao pojam, predstavlja cjelokupni proces stvaranja branda, od samog inicijalne pretpostavke za postavljanje proizvoda ili usluge na tržište, analiza potrošačkih preferencija i percepcija potencijalnih korisnika, kreiranja komunikacijskih kanala, promocije do plasiranja na tržište i konzumacije sa strane krajnjih korisnika i potrošača.

Na primjeru Prometne škole u Rijeci prikazati će se ciljano mijenjanje logotipa u svrhu promotivne kampanje, kojim se nastoji stvoriti osviještenost o postojanju određenih obrazovnih usluga koje ta ustanova pruža.

3.2.Logotip Prometne škole u Rijeci

Cilj konstruiranja svakog logotipa jest stvaranje specifične prepoznatljivosti proizvoda ili usluge te samo stvaranje lojalnih korisnika. U kontekstu srednje Prometne škole, cilj je uskladiti vizualni identitet logotipa s programima koje ona pruža da bi se postigla određena razina pozitivne percepcije i zaokupila pažnja novih potencijalnih učenika ili korisnika usluge obrazovanja odraslih.

U nastavku teksta prikazana je komparacija starog i novog logotipa Prometne škole u Rijeci, gdje će se kroz konkretan primjer prikazati na što se posebno obraćala pozornost prilikom njegova kreiranja. Prometna škola u Rijeci, u svojem redovnom programu, nudi obrazovne programe tehničar cestovnog prometa, tehničar za poštanske i financijske usluge i vozač motornog vozila. Tehničar za poštanske i financijske usluge novi je strukovni kurikulum, koji je naslijedio program tehničar poštanskog i telekomunikacijskog prometa, čime se već, u samom nazivu obrazovnog programa, distancirao od prethodnika.

Stari i novi logotip Prometne škole u Rijeci

Prethodna slika prikazuje stari i novi logotip. Odmah je vidljivo da je sam vizualni identitet ublažen, prvenstveno u vidu boje. Crvena boja, po prirodi, predstavlja svojevrsnu opasnost te u samom prometu označava znakove opasnosti i zabrane, što u svijesti čovjeka automatski predstavlja averziju prema onome što vidi. Kod novog logotipa boje su ublažene, oku ne toliko izražajne te su linije jednostavne i decentne.

Ono po čemu se novi logotip diferencirao od starog očituje se kroz izostavljanje antene, zbog toga što je antena imala asocijaciju na stari program (tehničar poštanskog i telekomunikacijskog prometa), dok je u novom logotipu na slovo „P“ umetnuta omotnica, koja sugerira na novi program (tehničar za poštanske i financijske usluge) te, također, prikazuje samu putanju omotnice. Time se daje osjećaj brzine, leta, dostave te i sam stilizirani oblik slova „P“ okomito podsjeća na znak pošte. Također, u novom logotipu izostavljen je viličar, koji je prikazan na starome, zbog toga što sugerira na transportne radnike, što u konačnici ne predstavlja srž strukovne kvalifikacije vozača motornog vozila. Osim navedenog, u starom logotipu nalazilo se ortogonalno raskrižje, koje samo po sebi nije dovoljno prepoznatljivo. U novom logotipu, na slovima „Š“ i „R“, nalaze se vrlo sugestivni elementi prometnice i kružno raskrižje što odmah stvara asocijacije na prometnu struku oba obrazovna programa (tehničar cestovnog prometa i vozač motornog vozila). Nova kampanja na Instagram-u i Facebook-u, u kombinaciji s novim logotipom, pokazala veći broj reakcija u odnosu na prethodne kampanje.

4.ZAKLJUČAK

Okosnicu stručnog rada čini promatranje promocije u obrazovnim sustavima s naglaskom na stvaranje identiteta primjenom adekvatnog logotipa. Osvješćivanje krajnjih korisnika o postojanju obrazovnih programa složen je proces koji integrira različite promotivne aktivnosti, od oglašavanja na društvenim mrežama do izrade promotivnih materijala. Sinergijom svih elemenata i izradom logotipa, kojim se stvara prepoznatljivost, može se postići pozitivan krajnji rezultat, a to je upis većeg broja učenika i polaznika programa obrazovanja odraslih.

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TRAFFIC SCHOOL, RIJEKA

Jože Vlahovića 10

Marijeta Mašić, prof.
Alen Panić, struč. spec. ing. traff

PROMOTION IN EDUCATION

Abstract

Promotion is part of marketing activities. In practice, the terms marketing and promotion are often opposed as synonyms, but there are big differences between them. Marketing integrates all activities that start from the very creation of a product or service, distribution, promotion and sales to end users. Promotional activities seek to establish contact between users and service providers, and to develop awareness of the existence of the educational institution and its educational programs. It is necessary to adapt all marketing activities to the primary market niche, ie the target audience, while not forgetting that in regular education, the target audience is not only potential new students, but also their parents. The logo represents the central visual identity. Its precisely defined characteristics can contribute to a better perception of the institution by potential end users.

Keywords: marketing, education, logo, promotion, traffic school.

1. INTRODUCTION

Promotional activities are the core of marketing, primarily because of their role in creating contact between the seller and the buyer or, in the case of this professional work, between the educational institution and students, ie, adult learners.

Promotional activities can be manifested through different ways, and the most commonly used models are advertising, personal sales, fairs, sales promotion, etc. In this paper we will show how changing the logo can affect the visual identity of the educational institution, on the example of the Traffic School in Rijeka.

2. BASIC DETERMINANTS OF PROMOTION IN THE MARKETING MIX

Marketing is a complex system of different factors with the basic goal of marketing a product or service to end consumers. Such a system includes market research, production decision making, how to communicate with potential customers, distribution channels, promotional activities and sales. The term marketing is often interpreted as a synonym for promotional activities, such as advertising, fairs, campaigns, etc., but promotion is only one segment of the marketing mix, whose task is to make contact with end users and encourage their decision and purchase a product or service . Promotion in the education system will be the backbone of this critical work. The education system is part of the Quaternary sector.

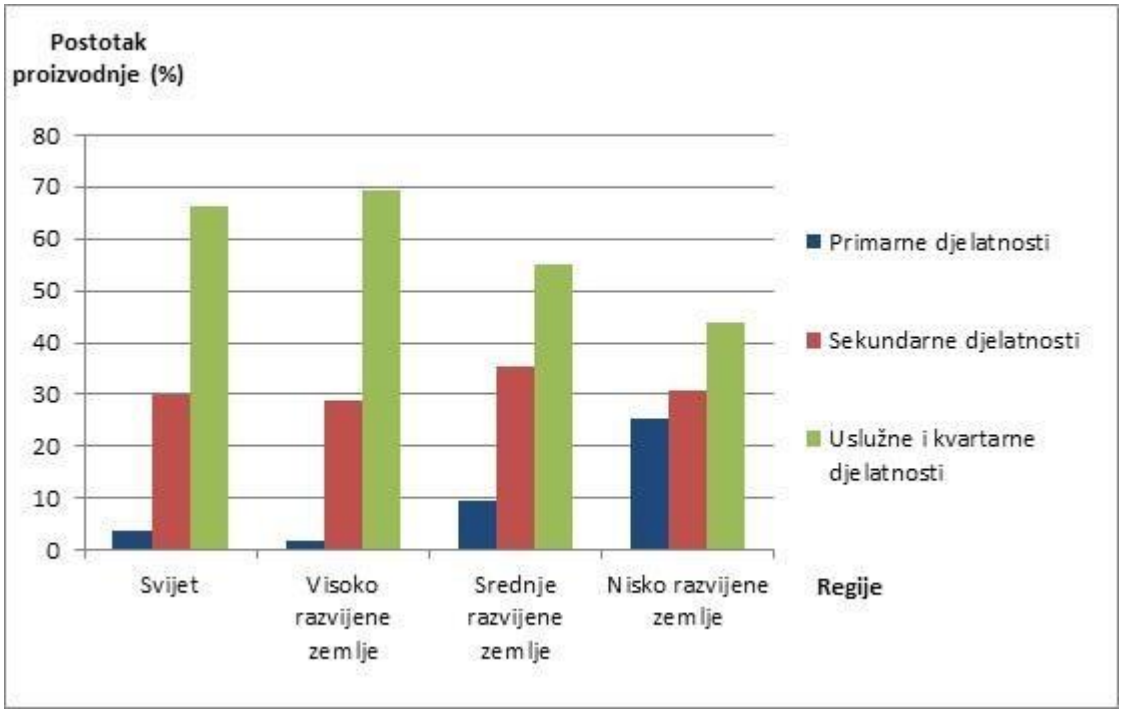
2.1. Market segmentation

The market consists of customers, and customers differ in many ways. Therefore, markets can be segmented in a number of ways. Market segmentation is an effort to increase the precision of a particular company or institution in selecting a target market. It can be performed at four different levels, and these are generalized segments, niche markets, local area or individual.

Market segments are usually large recognizable groups within the market. When niche markets are sought to be identified, they are most often divided into sub-segments that have certain common features.

2.2. Marketing services

The product or service, in the very context of marketing, does not represent different concepts in the planning of marketing activities, because the pattern of planning all activities until the sale to end consumers is the same. But what characterizes the fundamental difference between a product and a service is the presence of a physical component. The intangibility of the service is emphasized, but rarely does a service have an exclusively intangible component (such as counseling services, etc.).



Comparison of the Quaternary sector with other sectors in the world

As noted, education is part of the Quaternary sector. The previous figure shows how much the Quaternary sector occupies in relation to other sectors, taking into account that the Quaternary sector consists almost exclusively of service activities. When we talk about the provision of educational services, their specificity is manifested through the fact that production and use take place simultaneously. Thus, during the teaching process itself, students of regular programs or participants in adult education programs and teachers simultaneously participate in the creation and use of the service. In these forms of services, subjectivity is strongly present in the evaluation of the quality of the service provided by end users.

3. INFLUENCE OF LOGO ON USER PERCEPTION OF EDUCATIONAL INSTITUTION

Various factors in the environment of an educational institution directly affect how much it will be noticed on the market and in the perception of wider users, and among them can be singled out the birth rate, social status, trends in the labor market and the like.

3.1. Logo and branding

The logo represents the visual identity of a certain brand, whose adequate construction can very well reflect on its development. A brand, as a system of complex perceptual units, represents a synergy of different factors that identify a product or service. This refers to the logo of a particular company or institution, vision and mission, strategic approach to the market, design, value, etc.

A brand would be a narrower term than a brand, because it represents the visual identity of an entity and is the starting point for differentiating a product or service from other related products or services. The process of differentiation is a complex process, which cannot be reduced exclusively to the elementary characteristics of a product or service, but represents a whole series of factors that want to emphasize the overall difference from direct competition.

Branding, as a term, represents the entire process of creating a brand, from the initial assumption for placing a product or service on the market, analysis of consumer preferences and perceptions of potential users, creation of communication channels, promotion to marketing and consumption by end users and consumers.

The example of the Traffic School in Rijeka will show the targeted change of logos for the purpose of a promotional campaign, which seeks to create awareness of the existence of certain educational services provided by this institution.

3.2. Logo of the Traffic School in Rijeka

The goal of designing each logo is to create a specific recognizability of the product or service and just create loyal users. In the context of the High School of Transportation, the goal is to align the visual identity of the logo with the programs it provides to achieve a certain level of positive perception and capture the attention of new potential students or users of adult education services.

The following is a comparison of the old and the new logo of the Traffic School in Rijeka, where a concrete example will show what special attention was paid to when creating it. The Traffic School in Rijeka, in its regular program, offers educational programs road traffic technician, postal and financial services technician and motor vehicle driver. The Postal and Financial Services Technician is a new vocational curriculum, which inherited the program of postal and telecommunications traffic technician, thus already, in the very name of the educational program, distancing itself from its predecessor.

Old and new logo of the Traffic School in Rijeka

The previous image shows the old and new logo. It is immediately apparent that the visual identity itself is softened, primarily in the form of color. Red color, by nature, represents a kind of danger and in traffic itself indicates signs of danger and prohibition, which in the human mind automatically represents an aversion to what he sees. With the new logo, the colors are softened, less expressive to the eye and the lines are simple and decent.

What differentiated the new logo from the old one is the omission of the antenna, because the antenna had an association with the old program (postal and telecommunications technician), while in the new logo an envelope was inserted on the letter "P", which suggests a new one. program (postal and financial services technician) and also shows the envelope path itself. This gives a sense of speed, flight, delivery and the stylized shape of the letter "P" is vertically reminiscent of a mail sign. Also, the new logo omits the forklift, which is shown on the old one, because it suggests to transport workers, which ultimately does not represent the core of the professional qualification of a motor vehicle driver. In addition to the above, there was an orthogonal intersection in the old logo, which in itself is not recognizable enough. In the new logo, on the letters "Š" and "R", there are very suggestive elements of the road and a roundabout, which immediately creates associations with the traffic profession of both educational programs (road traffic technician and motor vehicle driver). The new campaign on Instagram and Facebook, combined with the new logo, showed a higher number of reactions compared to previous campaigns.

4. CONCLUSION

The backbone of professional work is the observation of promotion in educational systems with an emphasis on creating an identity by applying an adequate logo. Awareness of end users about the existence of educational programs is a complex process that integrates various promotional activities, from advertising on social networks to the creation of promotional materials. By synergizing all the elements and creating a logo, which creates recognizability, a positive end result can be achieved, and that is the enrollment of a larger number of students and participants in adult education programs.

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СРЕДЊЕ СТРУЧНО ОБРАЗОВАЊЕ ЗА ЗАНИМАЊА У ПОДРУЧЈУ РАДА САОБРАЋАЈ У РЕПУБЛИЦИ СРБИЈИ

Немања Радовић93, Светлана Величковић94, Марко Поповић[95]

Резиме: Методологија заснована на прилагођавању планова и програма стандардима квалификација и исходима који су дати овим стандардима развијена је како би се осигурао жељени ниво постигнућа свих ученика обухваћених образовним процесом за одређени образовни профил. Учешће стручњака из предузећа из одређене гране привреде у испитним комисијама на матурским испитима за ученике у средњим стручним школама омогућава спољашње вредновање образовног процеса и појединачно постигнуће сваког ученика који положи испит.

Методологија развијања планова и програма наставе и учења показала се успешном у целини. Поступак је једноставан и стандарди јасно дефинишу исходе, као и листу компетенција за одређену квалификацију.

Наставници су боље упознати са могућностима школа да се отворе према новим технологијама, па макар то спречило толико жељено осавремењивање школовања, институције би требало да при одлучивању о плановима и програмима пре прихвате гледиште наставника него ставове стручњака и менаџера из привреде.

Образовање би требало да ученицима пружи добре изгледе за проналазак посла на тржишту рада, као и да им омогући да лако промене занимање/посао унутар исте делатности. Напредовање у каријери је важан мотивациони фактор при одабиру професије и када компаније циљају да привуку стручније и способније раднике морале би да сарађују са школама и тако промовишу своју делатност већ у раним фазама образовног процеса код деце у основној школи.

Кључне речи: средње стручно образовање, стандард квалификације, план и програм наставе и учења

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УВОД

Развој стручног образовања за занимања у подручју рада саобраћаја требало би да прати развој и примену нових технологија у управљању саобраћајем и транспорту и раст удела логистичких услуга на тршишту. Прави изазов је усклађивање динамике прилагођавања процеса образовања новим технологијама и могућност да се у образовању примене савремене технологије, уређаји и компјутеризовано планирање, управљање и контрола у транспорту. ЕУ финансира пројекте ради стварања одрживих модела континуораног прилагођавања стручног образовања захтевима тржишта рада. Међутим, за сада се показало да су изазови већи од капацитета образовног сектора да спроведе потребна прилагођавања. У Србији се одвија процеси специјализације образовних профила у стручном образовању и стандардизација квалификација.

Примена Националног оквира квалификација у Србији од стране Мнистарства просвете, науке и технолошког развоја, утиче на поље образовања, али и на улогу Привредне коморе Србије, као активног заступника интереса послодаваца на тржишту рада. Примена дуалног модела у средњем стручном образовању довела је до удруженог рада обе стране ради стварања радне снаге оспособљене за примену савремених технологија и рад са савременом опремом.

Програми четворогодишњих и трогодишњих циклуса средњег стручног образовања имају озбиљних проблема у остваривању очекиваних нивоа примене нових технологија у процесу образовања. Школовање ученика за занимања у саобраћајној делатности стално ослања се на примену застарелих технологија, а темпо којим се образовни планови и програми осавремењују није задовољавајући (према прописима, није дозвољено применити измене курикулума током једног образовнг циклуса, школовање се завршава по започетом плану и програму). Применом модула у курикулуму предмета практичне наставе не могу се надокнадити трогодишње/четворогодишње „рупе“ и зато се ученици стално обучавају на застарелој опреми и користе застареле софтвере, а чак је проблематична и промена планова и програма ради усклађивања садржаја са изменама закона услед хармонизације домаћег законског оквира у саобраћају са директивама ЕУ.

Овај рад представља покушај да се у Србији дефинишу кључне области за предузимање мера у средњем стручном образовању у продручју рада саобраћаја, ради остваривања напретка у школовању младих и компетентних кадрова за тржиште рада.

ОСАВРЕМЕЊАВАЊЕ ОБРАЗОВНИХ ПРОФИЛА У ПОДРУЧЈУ РАДА САОБРАЋАЈ

Приступ по којем се прво припремају стандарди квалификација, уместо да се претходно дефинишу стандарди занимања, недовољно укључује заинтересоване стручњаке из компанија које раде у сектору саобраћаја, транспорта и услуга логистике. Агенције за квалификације Републике Србије примењује методологију равоја стандарда квалификација која даје могућност интересним групама из свера образовања и привреде да учествују у процесу припреме стандарда квалификација, као и у ревизији постојећих стандарда. Мала и средња предузећа нису заинтересована да учествују, услед чега је бројност стручњака из подручја рада ограничена.

Систем образовања на универзитетском нивоу требало би да обезбеди младе и стручне предаваче за рад у средњим стручним школама, међутим ови млади стручњаци одбијају запослење у школама јер су зараде ниске и професија није атрактивна. Обзиром да немају радно искуство нити искуство у наставничком послу, дипломце са универзитета – инжењере из области саобраћаја, транспорта и

логистике, требало би мотивисати да своје знање пренесу на нове генерације у средњим стручним школама.

Политика запошљавања не мотивише инжењере са универзитетским дипломама да се запошљавају као наставници стручних предмета у средњим школама. Ниске зараде, несигуран радни статус и одсуство поштовања према просветним радницима у српском друштву данас, представљају очигледне препреке да се млади дипломци са факултета одлуче за каријеру у сектору образовања. Средње стручне школе некада су биле веома добро повезане са привредом и ученици су од тога имали користи тако што су практичну обуку обављали на најмодернијој технологији, а млади наставници су имали могућност да промене посао и запосле се у предузећима са којима су школе сарађивале. Док су се технологије развијале, српска привреда је пропала деведесетих година 20. века и затворена је већина великих транспортних предузећа која су сарађивала са школама.

Последњих година, нове транспортне компаније примењују савремене технологије, запошљавају стручњаке и нуде привлачне услове рада младим инжењерима. Школе су изгубиле везу са водећим предузећима у подручју саобраћаја, транспорта и логистике, а ученици похађају практичну насаву веома лошег квалитета. Програми дуалног образовања у средњим стручним школама требало би да се примене у сарадњи са водећим компанијама из подручја транспортних услуга , а савремене технологије могле би да постану доступне ученицима на практичној настави. Укључивање предузећа у средње стручно образовање даје прилику послодавцима да буду укључени у процес образовања својих будућих радника.

Школе запошљавају наствнике на неодређено („до краја раднг века“) због чега су веома круте у погледу наглих захтева за увођење промена. Може се закључит да је школовање ученика за неко занимање ствар навике – инерције, пре него усклађеност образовања према реалним захтевима тржишта рада. Годину за годином, излазе нове генерације саобраћајних техничара, лоше обучени и нестручни техничари који нису способни да пронађу посао. Радије него да покушају да започну бизнис или да се определе да раде ники лоше плаћен посао, матуранти из средњих стручних школа траже прилику да наставе школовање на било којој вишој школи или факултету, само да не остану само са дипломом средње стручне спреме. Средње стручно образовање је веома скупо, док с друге стране српска привреда није у стању да запосли све младе техничаре, а на одређена занимања компаније радије запошљавају инжењере (струнији су и истовремено јефтини због нестабилног тржишта рада и несигурности радног статуса запослених). Хиљаде ученика се уписује сваке године и троше се милиони динара на њихово средње стручно образовање, док су подаци о запошљавању поражавајуће лоши. У грани саобраћај и транспорта највише се уписује образовни профил за квалификацију Техничар друмског саобраћајаја која се стиче кроз четворогодишњи програм средњег стручног образовања, док на тржишту рада постоји већ довољно тих кадрова. Други најпожељнији образовни профил за квалификацију Возач моторних возила је трогодишњи програм средњег стручног образовања и са стеченом квлификацијом матуранти имају добре изгледе да се запосле код домаћих превозника, али и да могућност да потраже посао у иностранству. Образовни профил ипак није омиљен зато што родитељи матураната основних школа желе да њиховој деци остане могућност да упишу виши ниво образовања по завршетку средње школе, док по закону то није дозвољено са дипломом о завршеном трогодишњем средњем образовању (услов је средње образовање у трајању од 4 године).

Мање популарне квалификације су техничари из подручја железничког саобраћаја и транспорта и Наутички техничар – речни смер. Законом је прописана обавеза да запослени на железници мора имати стручну спрему железничке струке, док истовремено ученици који заврше школу тешко успевају да се запосле у железничким предузећима. Нека занимања на железници су плаћенија, па су те квалификације и траженије на упису у средње школе. Мање привлачно занимање значи мање пожељна квалификација – образовни профил, тако да последично ученици из оснвних школа који су

завршили са слабијим успехом уписују мање атрактивне образовне профиле у средњим сручним шклама. У односу на основну школу, постигнућа ових ученика нису ништа боља ни у средњој школи, тако да наставници непрестано снижавају критеријуме како ђаци не би понављали и како би остали у школи, тако да сами наставници не постану технолошки вишак и остану без посла. На неки начин, образовање је постало привредна делатност – бизнис, производи хиљаде дипломаца свих нивоа образовања са бројним дипломама које немају праву вредност на тржишту рада.

Добра пракса у процесу осавремењивања средњег стручног образовања и образовних профила у подручју саобраћаја, транспорта и логистичких услуга

Методологија заснована на прилагођавању планова и програма стандардима квалификација и исходима који су дати овим стандардима развијена је како би се осигурао жељени ниво постигнућа свих ученика обухваћених образовним процесом за одређени образовни профил. Учешће стручњака из предузећа из одређене гране привреде у испитним комисијама на матурским испитима за ученике у средњим стручним школама омогућава спољашње вредновање образовног процеса и појединачно постигнуће сваког ученика који положи испит.

Припрема планова и програма наставе и учења је процес који води стручни саветник координатор запослен у Заводу за унапређивање образовања и васпитања. Радна група сачињена од наставника из стручних школа за одређену грану саобраћаја формира се ради развоја или прилагођавања плана и програма наставе и учења за одређени образовни профил према усвојеном стандарду квалификације. Радна група мора имати најмање једног универзитетског професора из стручне области. Ова група стручњака развија листу предмета која је релевантна за остваривање компетенција прописаних стандардом квалификације. Програми предмета се праве према прописаним исходима и описима знања, вештина и способности које мора да оствари сваки појединац који успешно заврши тај образовни профил и стекне диплому о положеном завршном/матурском испиту. Листа предмета се даље развија кроз документ који се зове Наставни план и програм за образовни профил у средњем стручном образовању за одређену квалификацију (недавно преименован у План и програм наставе и учења). Документ се припрема у форми табеле (видети табелу 1). Као што је приказано на примеру, трогодишњи програм је подељен на разреде или године и сваки предмет има одређени број часова/сати теоријске наставе и практичне наставе приказане недељно и годишње. Практична настава је подељена на вежбе и практичну наставу – обуку који се спроводе једном (или два пута) недељно кроз 2, 4 или 6 сати практичних активности. Практична обука може да се реализује кроз једнонедељне 30-сатне блокове практичне обуке за одређене специфичне задатке као што је припрема ученика за полагање тестова из познавања саобраћајних правила и прописа или такође, као практична обука вожње која се спроводи индивидуално а прописана је кроз блок (један, највише два часа дневно, 40 часова укупно). Сручни предмети за средње стручно образовање у трајању од три године могу да чине највише 65% укупног годишњег фонда часова, опште образовни предмети могу чинити највише 40% укупног годишњег фонда часова.

Предмети се развијају формирањем листе кључних тема, додељивањем одговарајућег броја часовасвакој теми и повезивањем кључних исхода из стандарда квалфикације са одговарајућим темама.Програм стручног предмета се комплетира додавањем препоручених садржаја као смерница које служе наставницима за припрему часова. Овај прилично поједностављен поступак примењује се за све предмете истим редоследом. Међутим, наставници – чланови радних група, имали су проблема да исходе повежу са одговарајућим темама, док су веома лако проналазили одговарајуће садржаје за сваку од тема. У обрнутом поступку, дефинисањем тема и одговарајућих садржаја на почетку, а затим повезивањем садржаја са исходима показало се ефикаснијим при раду са члановима

радних група. Додатна пажња усмерена је да се спречи понављање или изостављање неких исхода из стандарда у темама које су одређене.

Табела 2. *– План наставе и учења (илустрација)*

.		I РАЗРЕД							II РАЗРЕД							III РАЗРЕД							УКУПНО				Σ
		weekly			yearly				weekly			yearly				weekly			yearly				yearly				
		Т	В	ПН	Т	В	ПН	Б	Т	В	ПН	Т	В	ПН	Б	Т	В	ПН	Т	В	ПН	Б	Т	В	ПН	Б	
А2: ОБАВЕЗНИ СТРУЧНИ ПРЕДМЕТИ		**14**	**3**		**518**	**111**			**10**	**6**	**4**	**370**	**222**	**148**		**10**	**7**	**6**	**320**	**224**	**192**	**60**	**1208**	**557**	**340**	**60**	**2165**
1	**Основи саобраћаја и транспорта**	**3**			**111**																		**111**				**111**
2	**Техничка физика**	**2**			**74**																		**74**				**74**
3	**Терети у транспорту**	**3**			**111**				**2**	**2**		**74**	**74**										**185**	**74**			**259**
4	**Техничка механика**	**2**			**74**																		**74**				**74**
5	**Техничко цртање са машинским елементима**	**1**	**1**		**37**	**37**																	**37**	**37**			**74**
6	**Безбедност руковања теретом**								**2**			**74**				**1**	**1**		**32**	**32**			**106**	**32**			**138**
7	**Механизација претовара**	**3**	**2**		**111**	**74**			**3**	**2**		**111**	**74**			**3**	**2**		**96**	**64**			**318**	**212**			**530**
8	**Интермодални транспорт**								**3**			**111**											**111**				**111**
9	**Одржавање средстава унутрашњег транспорта**															**2**	**2**		**64**	**64**			**64**	**64**			**128**

10	**Прописи у друмском саобраћају**															**1**	**1**		**32**	**32**		**60**	**32**	**32**		**60**	**124**
11	**Складишта**															**3**	**1**		**96**	**32**			**96**	**32**			**128**
12	**Предузетништво**									**2**			**74**											**74**			**74**
13	**Практична настава**										**4**			**148**				**6**			**192**			**340**			**340**
Б2: ИЗБОРНИ ПРОГРАМИ									**1**			**37**				**1**			**32**				**69**				**69**
2	Изборни програм према програму образовног профила								**1**			**37**				**1**			**32**				**69**				**69**
Total А2+Б2		**14**	**3**		**518**	**111**			**11**	**6**	**4**	**370 (407**)**	**222**	**148**		**11**	**7**	**6**	**320 (352**)**	**224**	**192**	**60**	**1208 (1277**)**	**557**	**340**	**60**	**2165 (2234**)**
Total А2+Б2		**17**			**629**				**20 (21**)**			**740 (777**)**				**23 (24**)**			**796 (828**)**				**2165 (2234**)**				

Т-теоријска настава; В-вежбе; ПН-практична настава; Б-блок настава

Развијање планова наставе и учења за образовне профиле у средњем стручном образовању засновано на сандардима квалификација уз примену оригиналне методе одређивања исхода и њима припадајуће теме, а затим додељивање ових тема и исхода одговарајућим предметима није се показало ефикасним и није довело до успешног комплетирања курикулума, па је било потребно поновити поступак неколико пута до добијања коначне верзије плана и програма. Нови програми показали су се веома захтевним за наставнике, који су имали потешкоћа да пронађу препоручене садржаје за програме предмета у литератури, док школе имају приликом набављања дидатктичких средстава за реализацију наставе.

SWOT анализа методологије ЗА ОСАВРЕМЕЊИВАЊЕ ОБРАЗОВНИХ ПРОФИЛА

Методологија развијања планова и програма наставе и учења показала се успешном у целини. Поступак је једноставан и стандарди јасно дефинишу исходе, као и листу компетенција за одређену квалификацију. Прописи који уређују однос броја часова општеобразовних и стручних предмета често стварају потешкоће и захтевају развијање нових прилагођених стручних предмета као што су сручни страни језик или додатне предмете о рачунарима и програмирању (ови општеобразовни предмети стављају се на листу стручних предмета). Кључни елементи SWOT анализе представљени су у Табели 2.

Методологија осавремењивања планова и програма средњег стручног образовања која се прмењује у Србији заснива се на стандардима квлификација. План и програм наставе и учења било којег образовног профила требало би да омогићи достизање прописаних кључних исхода из датог стандарда квалификације. Прописи у погледу стручне спреме и стручних знања наставног особља, правилници о простору, опреми и другим условима које морају испуњавати школе, заједно са планом и програмом наставе и учења стварају предуслове за остваривање исхода прописаних стандардима квалификација. Међутим, достизање прописаних исхода највише зависи од самих школа које спроводе програме и од спремности школа да прихвате нове стандарде и правила.

Табела 3. *- SWOT анализа*

Strengths	**Weaknesses**	**Opportunities**	**Threats**
Стандарди квалификација дефинишу компетенције и исходе	Стандарди су усвојени за квалификацију (покрива више занимања/послова)	Наставници треба да се прилагоде новој форми планова наставе и учења	Крути систем у школама и неспособност прилагођавања новом концепту стручног образовања
Садржај одређеног предмета гађа релевантне исходе из стандарда	Школе морају да унапреде своје капацитете (простор, опрема, наставно особље)	Примена нових технологија у образовном процесу кроз повезивање школа и компанија	Компаније које теже да развијају стручне образовне профиле специјализоване само за једно занимање/посао

Наставници стручних предмета требало би да осавремене програме својих предмета, науче нове технологије, савладају употребу модерних уређаја, опреме и возила и да непрестано прате нове прописе из области струке. Мотивација наставног особља је ниска/осредња ако се има у виду да су услови рада и плате најблаже речено нестимулативни. Образовни систем је правно уређен, али прописи се селективно примењују на појединце, уместо да се системски спроводе. Инспекције, надзори, али изнад свега подрша наставницима који је подршка потребна, кључна су питања која се морају решити ако се надамо бољим резултатима у средњем стручном образовању. Искусни наставници требало би да прихвате нове технологије зато што је примена нових софтвера, уређаја и опреме у школовању нових генерација очигледна потреба. Млади наставници немају искуства,а

њихово знање и стручност и често су изнад нивоа који је поребан у односу на стандарде средњег стручног нивоа. Прилагођавање стандарда и спуштање на прописан ниво исхода било које квалификације је процес за који су потребни и стручност и искуство. Искусни старији и млади мање искусни наставници који су стигли право са студија у средње школе да предају требало би да сарађују како би оптималано осавременили програме и истовремено задржали традиционалне вредности и квалитете средњег стручног образовања.

Руководства школа морају развити сарадњу са водећим транспортни и саобраћајним предузећима. Укључивање компанија у школовање ђака је кључно за развој одрживог средњег стручног образовања, припрему ученика за занимања у саобраћају, транспорту и логистици, а посебно ради достизања жељеног нивоа знања и стручности који се траже на тржишту рада.

Ако школе не успеју да обезбеде савремене уређаје, софтвере и друга наставна средства ови курикулуми ће постати „спискови лепих жеља“. Ако наставници не овладају новим технологијама и не буду пратили иновације у привреди, ученици ће стицати застарела знања и вештине, тако да ће самим тим бити мање интересантни послодавцима на тржишту рада.

Каријерно саветовање ученика основних школа потребно је унапредити, посебно у погледу поуздане процене њихових физичких и психолошких способности и склоности. Модернизација образовног процеса намеће нове концепте, инклузивно образовање за децу са посебним потребама или са физичким/менталним потешкоћама и прилагођавање школа и наставног особља овим новим захтевима. Утицај на стручно образовање свих ученика види се кроз дистракције ученика и наставника током процеса стручне праксе. Питање стручне оспособљености/компетентности ученика који похађају наставу кроз модел инклузивног образовања у средњим стручним школама остаје отворено. Послодавци имају мало или нимало интересовања да приме ученике са посебним потребама да стручну праксу похађају у њиховим компанијама.

Прилагођавање крутог образовног система тражи време и све заинтересоване стране требало би да дају конструктиван допринос овом процесу. Предузећа би требало да омогуће прилику за наставнике да прате најновије технологије и за ученике да стичу најсавременију стурчну праксу. Користи за послодавце су очигледне када се узме у обзир селекција будућих запослених и истовремено промоција њихових предузећа на тржишту. Ученици би могли да остваре корист од ефикасније обуке и подизања нивоа компетентности за занимања у овој грани првреде. Школе би могле да подигну квалитет образовног процеса и поврате друштвени углед.

Укључивање предузећа у развој средњег стручног образовања мора остати транспарентно и пажљиво осмишљено. Челни руководиоци у предузећима (нарочито државним) често имају упитно знање, док су њихови моћ и утицај на доносиоце одлука веома снажни. Док покушавају да створе јефтину и уско специјализовану радну снагу за своје компаније, менаџери из предузећа подржавају програме и квлификације уско специјализоване за одређена занимања/послове. Превиђа се потреба будућих генерација за стварање одрживе животне и радне средине. Могућност целоживотног учења је основна потреба савременог човека. Каријерно планирање и могућност напредовања мотивишу младе да прихвате изазове, ризикују, истражују нове технологије и зато су застарела занимања ниско на њиховој скали интересовања. Стручњаци из области образовања који су претходно специјализовани за одређену област привреде требало би да предводе развој средњег стручног образовања како би осигурали квалитет образовног процеса и ограничили непожељан утицај компанија на образовање. Предузећа која би пружила савремене технологије и стручне описе промена захтева на тржишту радне снаге омогућила би стручњацима из образовања да развију поуздане стандарде квлификација и одговарајуће програме средњег стручног образовања за остваривање тих стандарда.

закључак

Наставници су боље упознати са могућностима школа да се отворе према новим технологијама, па макар то спречило толико жељено осавремењивање школовања, институције би требало да при одлучивању о плановима и програмима пре прихвате гледиште наставника него ставове стручњака и менаџера из привреде. Фундаментална знања су важна ако желимо да научимо будуће генерације како да користе логику, откривају изуме и развијају нове технологије. Специјализација стручног образовања, сужавање знања и вештина, односно развијање само уског склопа знања и вештина за одређена занимања/послове (јер је јефтиније), као што то желе менаџери и неки стручњаци из компанија мора се опрезно примењивати. Образовање би требало да ученицима пружи добре изгледе за проналазак посла на тржишту рада, као и да им омогући да лако промене занимање/посао унутар исте делатности. Напредовање у каријери је важан мотивациони фактор при одабиру професије и када компаније циљају да привуку стручније и способније раднике морале би да сарађују са школама и тако промовишу своју делатност већ у раним фазама образовног процеса код деце у основној школи.

Закључак би могао бити да унапређивање сарадње међу наставницима у стручним школама, удруживање генерација и коришћење знања младих и искуства старијих наставника може створити бољи амбијент за развој средњег стручног образовања. Ангажовање водећих саобраћајних, транспортних и логистичких предузећа у образовни процес оснажује улогу послодаваца у припремању будуће радне снаге за послове у овој грани привреде.

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VOCATIONAL EDUCATION FOR OCCUPATIONS IN FIELD OF TRAFFIC, TRANSPORTATION AND LOGISTICS

Nemanja Radovic[96], Svetlana Velickovic[97], Marko Popovic[98]

Abstract: Methodology based on adjusting curriculum to the qualification standards and outcomes given in these standards is designed so it would insure a desired level of achievement of all students in the schooling process. Participation of experts from companies of the given industry in the examination commissions on graduation exams from the secondary level school's students enables external validation of the education process and the achievement of every student passing the exam.

Methodology of designing the Plan of Teaching and Learning proved to be efficient. Algorithm is simple and standards clearly define outcomes, as well the list of competences for a qualification.

Teachers are more familiar with the capacities of schools to reach out to new technologies and even this could prevent desired modernization of schooling process, institutions should side with teachers rather than with experts and managers from the industry when it comes to deciding how to develop curriculums.

Education should provide students a fair chance of finding a job on the labor market and enable them to change occupations in the industry. Career progression is important motivation factor in choosing a profession and if the companies aim to attract more competent and resourceful labor they must collaborate with schools to promote the industry in the early stages of education process in elementary schools.

Keywords: secondary vocational education, standard of qualification, Plan of Teaching and Learning

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INTRODUCTION

Development and implementation of new technologies in traffic management and transportation and increase in market shares of logistics services must be complemented by development of vocational education for the occupations in this industry. The dynamics of adjustment of education process to new technologies and implementation of up to date technologies, devices and computerized planning, management and control of transportation is a challenge. EU is funding projects in attempt to create sustainable models for vocational education continuous adjustment to labor market demands. However, these challenges have proven to be above of the education sector capacity to adjust. Specialization of vocational education profiles and standardization of qualifications is an ongoing process in Serbia.

Implementation of National Qualifications Framework in Serbia by the Ministry of Education is affecting the field of education, as well as the roll of the National Chamber of Commerce as active stakeholder representative regarding the interests of employers on the labor market. Extensive implementation of dual model in secondary vocational education brings two sides together more than ever in effort to provide labor force capable to operate up to date devices and implement newest technologies.

Four-year and three-year cycle programs in secondary vocational education struggle to maintain expected level of implementation of new technologies in educational process. Schooling of students for occupations in traffic and transport industry constantly implements obsolete technologies and the dynamics of adjustment of the schooling programs for these qualifications is inadequate (by low, change in curriculum can't be implemented to ongoing schooling programs). Implementation of modular curriculum for practical training and education of students fails to compensate for this three/four-year gaps and students constantly train on obsolete devices or software and even the traffic and transport legislation harmonization to the EU directives creates obstacles for the curriculum adjustment.

This paper aims to define crucial areas of intervention in the secondary vocational education in the field of traffic and transport in Serbia in order to improve schooling of young and competent individuals for the labor market.

Modernization of vocational education in Field of Traffic, Transportation and Logistics

Concept of creating standards for qualifications rather than standards for occupations fails to involve competent stakeholders from companies operating in transportation and logistics industry. The methodology of development of qualification standards is based on the National Qualifications Agency leadership and it provides an opportunity for stakeholders both from educational sector and the industry to take part in the process of creating new qualification standards and reviewing of existing standards as well. Small and medium size companies have no interest to take part, so the number of experts in the field is limited.

University level education must provide young and competent educators for the secondary level vocational schools, but also these young experts reject jobs in secondary vocational schools due to low salaries and unattractive working conditions. Thou with no experience in educating students, graduates from universities in field of traffic and transport and logistics industry, need to be motivated to transfer their knowledge to the next generation in secondary level vocational schools.

Policy of employment in the education sector fails to motivate engineers with university level degree to take teaching positions in schools. Low income, insecure employment status and lack of respect for educators in modern Serbian society are obvious obstacles for young university graduates to start their carriers in

education sector. However, secondary vocational schools used to be well connected to the industry and students benefited by getting practical training on up to date technologies and young teachers had the opportunity to get a job in these companies. As the technologies developed, Serbian transport industry in the 1990's collapsed and the major transport companies collaborating with vocational schools were closed.

In recent years, new companies in transportation industry implement up to date technologies, employ experts and offer attractive working environment for young engineers. Schools lost the connection with leading companies in the industry and students attend poor professional training. Dual education programs in secondary vocational schools are to be implemented in cooperation with leading companies in the transport industry and up to date technologies could be used for professional training of students. Inclusion of companies into secondary vocational education offers a chance for employers to be involved in schooling of their future employees.

Schools employ teachers for an indefinite period of employment and for this reason schools are very rigid regarding any sudden need for change. Schooling of students for a certain qualification is a matter of habit, rather than response to the demand on the labor market. Year after year we get new generations of traffic and transportation technicians, poorly trained and incompetent, unable to find jobs. Rather than starting a business or getting a low salary job, graduates form vocational schools look for opportunities to get higher education, so they enroll any university they can. Vocational education is very expensive one, yet Serbian economy is unable to absorb young technicians and for those occupations companies prefer to employ engineers (more competent, yet cheap due to labor market instability and job insecurity). Thousands of students enroll every year, and millions are spent on vocational education and professional training with low employment statistics. In the field of traffic and transportation, the qualification of Road Traffic and Transportation Technician is four-year schooling program students enroll the most and labor market is saturated. Driver of Motor Vehicles, as the second most desirable qualification is a three-year schooling program offering a very good chance for employment in domestic companies, as well as an opportunity to work abroad. This qualification is not popular since parents of graduates at the elementary schools would like to reserve a chance of higher education for their children and enrolling universities isn't possible after graduating from a secondary level three-year programs.

Less popular qualifications are technicians of different profiles on the railroad and Nautical Technician for the River Navigation. Getting a job in the railroad company with adequate qualification is hard, yet qualification is mandatory for employment of railroad workers by low. Some occupations on the railroad offer better salary and there for are more attractive ones. Less attractive occupation equals less attractive qualification and consequently less successful graduates from elementary schools enroll secondary vocational schools and these less attractive programs. Student's achievements are not better on the secondary level then in the elementary schools and teachers continuously lower the criteria in order to keep the students in schools, so they can keep their teaching positions. In a way, education has become an industry of its own, producing thousands of graduates of all levels and numerous diplomas of no actual value on the labor market.

Good practice IN Modernization of vocational education PROFILES in Field of Traffic, Transportation and Logistics

Methodology based on adjusting curriculum to the qualification standards and outcomes given in these standards is designed so it would insure a desired level of achievement of all students in the schooling process. Participation of experts from companies of the given industry in the examination commissions on graduation exams from the secondary level school's students enables external validation of the education process and the achievement of every student passing the exam.

Curriculum preparation is a process guided by the expert coordinator from The Institute for the Improvement of Education. Group of teachers from schools of a given sector of transportation is selected for the development or adjustment of the curriculum according to the qualification standards specifications. Task group must include at least one university professor. This group of experts develops a list of subjects/courses relevant to the qualification standards. Program is designed according to the desired outcomes and descriptions of the knowledge, skills and abilities of any individual graduated from this secondary level schooling program. This list of courses is transposed into a Plan and Program of the vocational education profile for the qualification (recently renamed - Plan of Teaching and Learning). The document is designed in form of a table (see table 1). As shown in the example, a three-year program is divided into grades or years and every course has a given number of hours (classes) of theoretical education and practical training weekly and yearly. Practical training is divided into exercises and practical training conducted once (or twice) a week through two, four or six hours of practical activities. Practical training could be conducted through a one week 30 hours block of practical training for special tasks such as preparation of students for tests of the traffic regulations knowledge, but also practical drivers training is conducted individually (one or two hours max. a day, 40 hours in total). Vocational courses for a three-year secondary level education program may take up to 65% of total hours per year, general education courses have up to 40% of total hours per year.

Table 1. *– Plan of Teaching and Learning (illustration)*

.		I GRADE							II GRADE							III GRADE							TOTAL				Σ
		weekly			yearly				weekly			yearly				weekly			yearly				yearly				
		T	E	PT	T	E	PT	B	T	E	PT	T	E	PT	B	T	E	PT	T	E	PT	B	T	E	PT	B	
A2: ОБАВЕЗНИ СТРУЧНИ ПРЕДМЕТИ		**14**	**3**		**518**	**111**			**10**	**6**	**4**	**370**	**222**	**148**		**10**	**7**	**6**	**320**	**224**	**192**	**60**	**1208**	**557**	**340**	**60**	**2165**
1	**Основи саобраћаја и транспорта**	**3**			**111**																		**111**				**111**
2	**Техничка физика**	**2**			**74**																		**74**				**74**
3	**Терети у транспорту**	**3**			**111**				**2**	**2**		**74**	**74**										**185**	**74**			**259**
4	**Техничка механика**	**2**			**74**																		**74**				**74**
5	**Техничко цртање са машинским елементима**	**1**	**1**		**37**	**37**																	**37**	**37**			**74**

6	**Безбедност руковања теретом**								**2**			**74**				**1**	**1**		**32**	**32**			**106**	**32**			**138**
7	**Механизација претовара**	**3**	**2**		**111**	**74**			**3**	**2**		**111**	**74**			**3**	**2**		**96**	**64**			**318**	**212**			**530**
8	**Интермодални транспорт**								**3**			**111**											**111**				**111**
9	**Одржавање средстава унутрашњег транспорта**															**2**	**2**		**64**	**64**			**64**	**64**			**128**
10	**Прописи у друмском саобраћају**															**1**	**1**		**32**	**32**		**60**	**32**	**32**		**60**	**124**
11	**Складишта**															**3**	**1**		**96**	**32**			**96**	**32**			**128**
12	**Предузетништво**									**2**			**74**											**74**			**74**
13	**Практична настава**										**4**			**148**				**6**			**192**			**340**			**340**
Б2: ИЗБОРНИ ПРОГРАМИ									**1**			**37**				**1**			**32**				**69**				**69**
2	Изборни програм према програму образовног профила								**1**			**37**				**1**			**32**				**69**				**69**
Total А2+Б2		**14**	**3**		**518**	**111**			**11**	**6**	**4**	**370 (407**)**	**222**	**148**		**11**	**7**	**6**	**320 (352**)**	**224**	**192**	**60**	**1208 (1277**)**	**557**	**340**	**60**	**2165 (2234**)**
Total А2+Б2		**17**			**629**				**20 (21**)**			**740 (777**)**				**23 (24**)**			**796 (828**)**				**2165 (2234**)**				

T-theoretical education; E-exercises; PT-practical training; B-block

The courses are developed by listing key themes, assigning adequate number of hours for each theme and linking of key outcomes from the qualification standards to the appropriate theme. A vocational education subject/course program is completed by adding recommended content as a guideline for the teachers. This fairly simplified procedure is applied for each subject/course in the same order. However, teachers had difficulties to attribute outcomes to the appropriate theme, but in the same time they were able to come up with appropriate content for the themes. In the reversed process, by defining the themes and appropriate contents in the beginning and linking the outcomes afterwards proved to be more efficient procedure for the task group. Additional attention prevented repetition or exclusion of some outcomes from the standards across the themes.

Development of vocational education Plans of Teaching and Learning based on qualification standards by implementing the original method of determining outcomes based themes and allocating these themes to designed courses failed to produce efficient and successful completion of the curriculum development process, so it took several iterations to complete the job. However, these programs proved to be too demanding for the teachers since they had difficulties finding the recommended content in the literature and the schools have problems in procurement of the didactical resources.

SWOT analyses of the Methodology of vocational education profiles

Methodology of designing the Plan of Teaching and Learning proved to be efficient. Algorithm is simple and standards clearly define outcomes, as well the list of competences for a qualification. Regulations regarding number of hours of vocational and general education courses and their percentage ratio, often cause the need to create new customized vocational courses/subjects such as second foreign language, or additional computer sciences (general education subjects, but placed on the vocational subjects list). The key elements of SWOT analyses are presented in Table 2.

Table 2. *- SWOT analyses*

Strengths	**Weaknesses**		**Opportunities**	**Threats**
Qualification standards define competences and outcomes	Standards are designed for a qualification (covers several occupations)		Teachers need to adjust to the new form of The Plan of Teaching and Learning	Rigid system in schools and inability to adjust the new concept of vocational education
Content of a given subject/course targets relevant outcomes from the standard	Schools need to improve their capacities (space, equipment, teaching staff)		Implementation of new technologies in the education process by connecting schools and companies	Companies attempting to create vocational education profiles for specialized a single occupation

Secondary vocational education curriculum modernization methodology implemented in Serbia is based on qualification standards. Curriculum of a vocational profile for any qualification creates conditions for achieving designed crucial outcomes based on the qualification standard. Regulations regarding expert

knowledge and qualifications of the teaching staff and regulations regarding the space, equipment and other conditions for schools, together with curriculum design optimal conditions for achieving outcomes prescribed by the qualification standard. However, this mainly depends upon the schools that implement the curriculum and their capacity and motivation to adopt new rules and standards.

Teachers of vocational courses need to modernize their programs, learn new technologies, train for the usage of modern devices, equipment and vehicles and continuously keep up with the new regulations in their area of expertise. Motivation of the teaching staff is low/moderate considering that working conditions and salaries for their positions are least to say not stimulating. Education system is regulated, but these regulations are selectively applied on individuals rather than systematically. Inspections, controls and above all support for the teachers in need are key issues that must be addressed if we hope for better outcomes in the secondary vocational education. Experienced teachers need to embrace new technologies and the inclusion of modern software, devices and equipment in the schooling process of new generations is an obvious necessity. Young teachers lack experience and often their knowledge is over-specialized and the level of expertise is above the desired standards for secondary education level. Lowering the standards to the designed level of outcomes of any qualification is a process of adjustment that includes both expert knowledge and experience. In conclusion, experienced older teachers and young inexperienced teachers coming straight from universities to schools need to cooperate in order to achieve optimal level of modernization, but in the same time keeping all the positive traditional values of secondary vocational education.

School administrations must provide cooperation with the industry's leading companies. Inclusion of the companies in the schooling process is essential for development of sustainable vocational education, preparation of students for occupations in the industry of transportation and logistics and achieving the desired level of knowledge and expertise demanded on the labor market.

Schools have the opportunity to collaborate with universities by promoting available teaching positions among faculty students. Young graduates from universities have some difficulties in starting their careers, and teaching positions in vocational schools offer them opportunity to get professional experience with fair salary and lots of free time to improve their skills. Universities could benefit too, as some programs have low employment statistics and increasing the chance of employment for some students could be a motivational factor to enroll.

If the schools fail to provide up to date devices, software and other didactical aides, the curriculums will turn into wishful thinking lists. If the teaching staff fails to adopt new technologies and doesn't keep up with all the innovations in the industry, students will get obsolete knowledge and skills and consequently they'll be less attractive for the employers on labor market.

Career guidance of elementary school pupils must be upgraded, including reliable assessment of their physical and psychological abilities. Modernization of the education process imposes new concepts, inclusive education for the children with special needs or physically/mentally challenged children and the adjustment of schools and teaching staff to these special demands. This affects the vocational education process of other students and distracts both students and teachers in the professional training process. The question of professional competence of students undergoing programs of inclusive education in vocational schools remains open. In the same time, employers have little or no interest to enroll these students to take practical training in their companies.

Adjustment of rigid education system takes time and every stakeholder should contribute in a constructive manner. Companies should provide opportunities for teachers to keep up with newest technology and for students to get up to date professional training. Benefits for employers are obvious regarding selection process of the future employees and promotion of their companies on the market. Students could benefit by getting efficient training and upgrading their level of competence for occupations in the industry. Schools would upgrade quality of the education process and regain the respectable position in the society.

Engagement of companies in the secondary level vocational education development process must be transparent and carefully designed. Leading managers in companies often have questionable knowledge, yet strong influence on the decision makers. Attempting to get cheap and specialized labor for their companies, managers from companies support programs and qualifications narrowly specialized for specific occupationc. They overlook the needs of future generations to create a sustainable living and working environment. Lifelong learning opportunity is the modern-age human necessity. Career planning and opportunity to progress motivate young people to embrace challenges and take risks, research new technologies and obsolete occupations are low on the scale of their interest. Experts in the field of education specialized for a certain industry should lead the way in the vocational education development to ensure quality and limit the influence of companies. Companies providing new technologies and the expert descriptions of changes in the labor market demand enable the education experts to create reliable qualification standards and adequate programs for vocational education in secondary level schools.

CONCLUSION

Teachers are more familiar with the capacities of schools to reach out to new technologies and even this could prevent desired modernization of schooling process, institutions should side with teachers rather than with experts and managers from the industry when it comes to deciding how to develop curriculums. Fundamental knowledge is important if we hope to teach future generations how to implement logics and discover new technologies. Specializing vocational education, narrowing the knowledge and developing only the basic skills for given occupations (it’s cheaper) as desired by the managers and some experts from the companies must be carefully implemented. Education should provide students a fair chance of finding a job on the labor market and enable them to change occupations in the industry. Career progression is important motivation factor in choosing a profession and if the companies aim to attract more competent and resourceful labor they must collaborate with schools to promote the industry in the early stages of education process in elementary schools.

In conclusion, improving of cooperation among teachers in vocational schools, bringing generations together and using the knowledge of younger generations and the experience of old teachers could create better environment for vocational education development. Engaging leading companies of the transportation and logistics services industry in schooling processes strengthens the roll of employers in preparation of future employees for occupations in the industry.

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ŠKOLA ZA CESTOVNI PROMET, ZAGREB
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SIGURNOST PJEŠAKA U PROMETU – MLADI ZA MLADE

Sažetak:

U posljednjem desetljeću Republika Hrvatska bilježi pad prometnih nesreća sa smrtno stradalim sudionicima, međutim taj broj još uvijek je iznad očekivanog. U skladu s tendencijom daljnjeg smanjenja smrtnosti na našim cestama izrađen je šesti Nacionalni plan sigurnosti cestovnog prometa koji donosi Vlada Republike Hrvatske za razdoblje 2021.-2030. godine. Ovaj plan usklađen je sa svjetskim i europskim smjernicama zakonske regulative iz područja sigurnosti cestovnog prometa u kojem se naglašava kako će upravo edukacija svih sudionika biti jedna od ključnih mjera za smanjenje ukopnog broja prometnih nesreća kao i smrtno stradalih na cestama.

Pješaci su svojom izloženošću i dalje jedna od najugroženijih skupina koja samim time zahtjeva i posebnu pozornost prilikom analize sigurnosti prometa. Škola za cestovni promet 2019. godine provodila je projekt pod nazivom ″Uoči me″ kojim je u sklopu aktivnosti educirano o uočljivosti pješaka preko 700 učenika iz 14 srednjih škola s područja Republike Hrvatske. Kao jedan od rezultata projekta nastala je izvannastavna aktivnost *Sigurnost pješaka u prometu* koja treću godinu za redom za glavni cilj ima edukaciju najmlađih sudionika u prometu, osnovnoškolske djece.

Ključne riječi:

- sigurnost pješaka
- mladi za mlade
- edukacija

1. Uvod

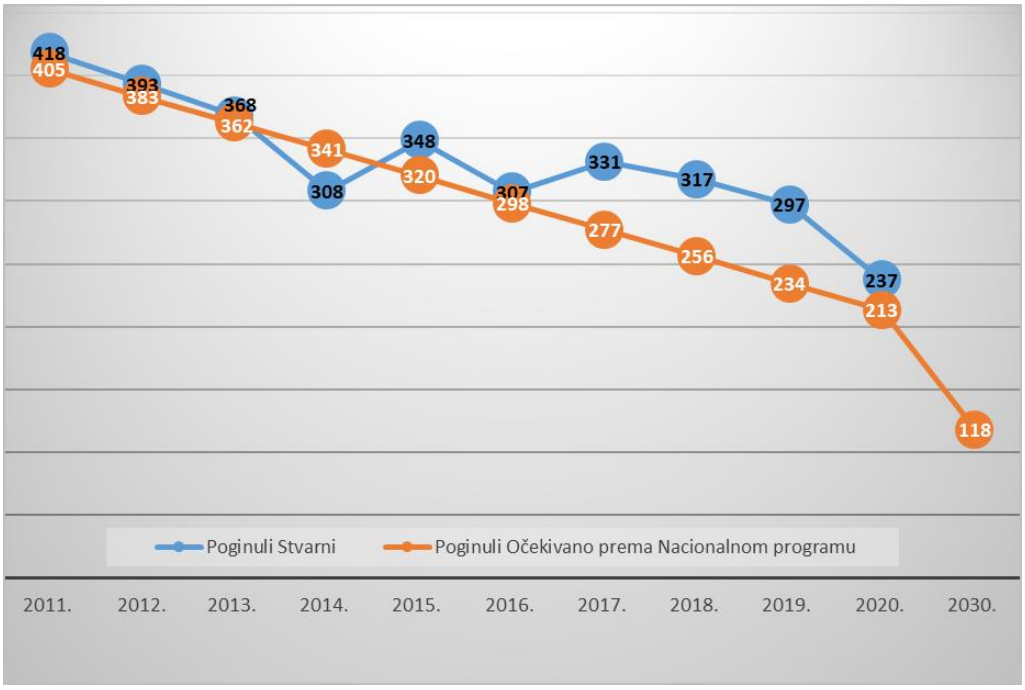
U posljednjem desetljeću Republika Hrvatska bilježi pad prometnih nesreća sa smrtno stradalim sudionicima, međutim taj broj još uvijek je iznad očekivanog. U skladu s tendencijom daljnjeg smanjenja smrtnosti na našim cestama izrađen je šesti Nacionalni plan sigurnosti cestovnog prometa koji donosi Vlada Republike Hrvatske za razdoblje 2021.-2030. godine. Ovaj plan usklađen je sa svjetskim i europskim smjernicama zakonske regulative iz područja sigurnosti cestovnog prometa u kojem se naglašava kako će upravo edukacija svih sudionika biti jedna od ključnih mjera za smanjenje ukopnog broja prometnih nesreća kao i smrtno stradalih na cestama. Kroz NPSCP raditi će se na proširenju postojećih i uvođenju novih preventivno-edukativnih programa u svim odgojno-obrazovnim ustanovama te provođenju preventivno-edukativnih i promidžbenih aktivnosti naglašavajući važnost načela cjeloživotnog učenja. Škola se smatra jednim od ključnih subjekata zaduženih za provedbu mjera edukacije te ovom aktivnošću želi kontinuirano provoditi educiranje najmlađih sudionika u prometu i utjecati na povećanje svjesnosti učenika - pješaka o važnosti upotrebe reflektirajućih materijala u prometu te usvajanje sigurnih životnih navika.

Kao nastavak uspješno provedenog projekta ″Uoči me″ Škola za cestovni promet u sklopu izvannastavne aktivnosti *Sigurnost pješaka u prometu* treću godinu za redom želi utjecati na podizanje razine svijesti i promjenu ponašanja pješaka kao najugroženije skupine sudionika u prometu. U izvannastavnoj aktivnosti sudjeluju učenici trećih razreda Škole za cestovni promet koji se školuju za zanimanje Tehničar cestovnog prometa. Učenici, koristeći znanja i kompetencije stečena u redovnom obrazovanju, kroz istraživanje i prikupljanje podataka uz superviziju voditeljice osmišljavaju interaktivno predavanje s radionicom za učenike osnovnih škola. Preventivnom edukacijom mlađih sudionika u prometu, djece u osnovnim školama, učenici koji sudjeluju u izvannastavnoj aktivnosti žele utjecati na povećanje njihove sigurnosti kao pješaka u prometu.

2. Analiza prometnih nesreća sa pješacima

Na hrvatskim se cestama se u razdoblju od 2011. do 2020. godine dogodilo 335 538 prometnih nesreća. U tim su nesrećama nastradale 107 444 osobe: poginule su 3 324 osobe, teško je ozlijeđeno 27 827 osoba, a 116 881 osobe su lakše ozlijeđene. U istom razdoblju broj prometnih nesreća s nastradalim osobama smanjio se s 13 228 u 2011. godini na 7 710 (41,71 %) u 2020. godini, lakše ozlijeđenih osoba s 14 656 na 7 740

(47,18 %), teško ozlijeđenih osoba s 3 409 na 2 295 (32,67 %) i broj poginulih u prometnim nesrećama smanjio se sa 418 na 237 poginulih (43,3%). Broj poginulih u prometnim nesrećama u posljednjih deset godina pao je sa 418 u 2011. godini na 237 u 2020. godini. Iz grafikona 1. vidljivo je da je u 2020. godini pad poginulih osoba u odnosu na prethodnu godinu za 60 osoba ili 20,2 %.

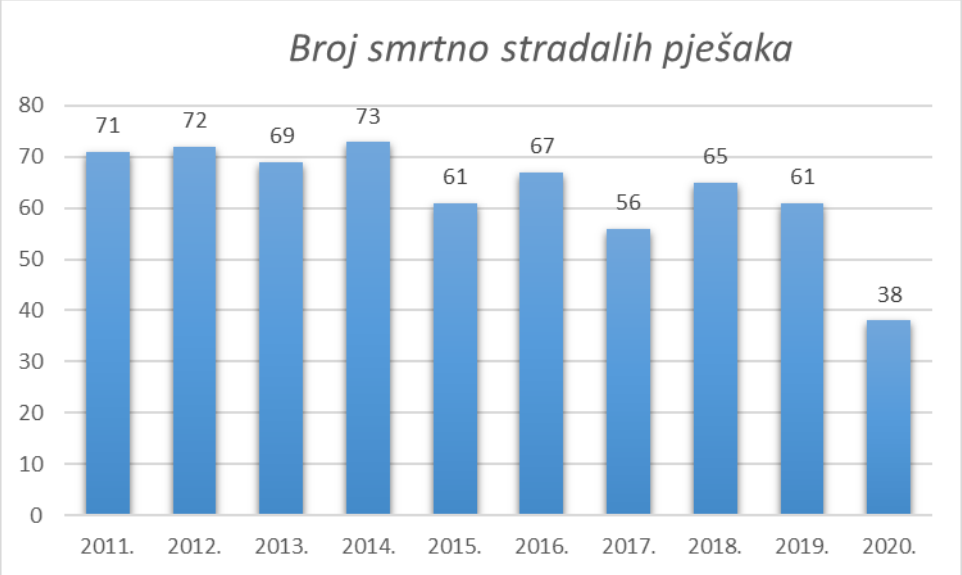


Grafikon 1 . Broj poginulih osoba u Republici Hrvatskoj i očekivani broj poginulih prema Nacionalnom programu

Prema šestom Nacionalnom planu sigurnosti cestovnog prometa koji donosi Vlada Republike Hrvatske za razdoblje 2021.-2030. godine aktivnosti će biti usmjerene na poboljšanje sigurnosti cestovnog prometa u vidu smanjenja broja poginulih osoba do 2030. godine. Predviđena poboljšanja infrastrukture, preventivni programi, edukacije i sveukupne aktivnosti biti će usmjerene da se broj poginulih 2030. godine smanji za 50% u odnosu na 2020. godini.

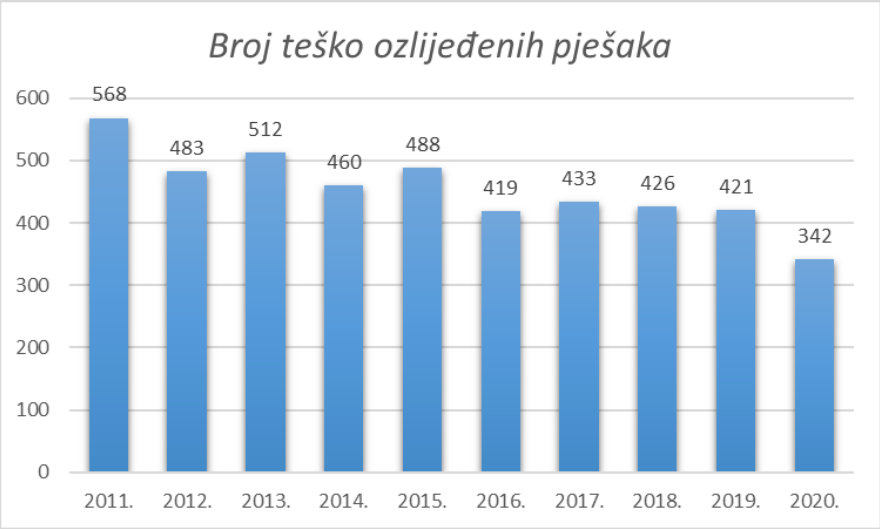
U razdoblju od 2011. do 2020. godine od ukupnog broja poginulih osoba u prometu 633 osobe su smrtno stradali pješaci, što znači da se gotovo 20% prometnih nesreća sa smrtno stradalima odnosi na pješake.

Iz grafikona 2. vidljivo je da broj smrtno stradalih pješaka ima tendenciju pada međutim sve pokazatelje treba također promatrati kroz prizmu pandemije Covida 19 koja je 2020. godine uvelike utjecala na smanjenje mobilnosti ljudi. Ukoliko uzmemo u obzir okolnosti koje su bile na snazi u 2020. godini broj smrtno stradalih pješaka daleko je iznad očekivanog.



Grafikon 2. Broj smrtno stradalih pješaka u razdoblju od 2011. do 2020. godine

Iz grafikona 3. vidljivo je da je broj teško ozlijeđenih pješaka u razdoblju 2011. do 2020. godine iznosio 4 552 osobe. U 2020. godini broj teško ozlijeđenih pješaka iznosio je 342 što je samo 17,34% manje u odnosu na prethodnu godinu te 39,78% u odnosu na 2011. godinu.



Grafikon 3. Broj teško ozlijeđenih pješaka u razdoblju 2011. do 2020. godine

Nastavkom analize o stradalim pješacima u prometu može se još istaknuti broj lakše ozlijeđenih pješaka koji je u razdoblju 2011. do 2020. ukupno iznosio 10 408 osoba. Broj lakše ozlijeđenih pješaka u 2020. godini iznosio je 622 što je 32% manje nego prethodne 2019. godine. Međutim, ukoliko uzmemo u obzir da je 2011. godine bilo 1 266 lakše ozlijeđenih pješaka a 2020. godine 622 svakako treba istaknuti da se taj broj smanjio za 50,86%.

Grafikon 4 . Broj lakše ozlijeđenih pješaka u razdoblju 2011. do 2020. godine

3. Izvannastavna aktivnost – Sigurnost pješaka u prometu

Prethodno prikazana analiza statističkih podataka ukazuje na kontinuiranu potrebu za poboljšanjem sigurnosti pješaka u cestovnom prometu odnosno poboljšanjem cjelokupne sigurnosti cestovnog prometa. U skladu s tim Škola za cestovni promet treću godinu za redom provodi izvannastavnu aktivnost Sigurnost pješaka u prometu čiji je jedan od glavnih ciljeva pripremiti učenike - mlade edukatore za edukaciju najmlađih sudionika u prometu. Izvannastavna aktivnost kroz čije provođenje se razvijaju učeničke kompetencije, vještine, kreativnost i samopouzdanje radi zadovoljavanja različitih potreba učenika koji u skladu s njihovim sklonostima, sposobnostima i interesima, potiče i razvoj dodatnih specifičnih oblika učenja.

Tijekom izvannastavne aktivnosti učenici samostalno provode istraživanje, te rezultate istraživanja i prikupljene podatke implementiraju u interaktivnu radionicu i edukaciju. Učenici kroz istraživanje područja sigurnosti cestovnog prometa, osmišljavanje anketnog upitnika, obradu i analizu podataka usvajaju multidisciplinarni pristup učenju i rješavanju problema. Sudjelovanjem u izvannastavnoj aktivnosti učenici integracijom postojećih i novodobivenih podataka razvijaju kritičko razmišljanje i društveno odgovorno ponašanje. Provođenjem edukacija, učenici stečeno znanje prenose učenicima osnovnih škola te na taj način žele također utjecati na poboljšanje sigurnosti cestovnog prometa. Jedan od najvećih rizika za pješake u prometu jest nedovoljno znanje i svijest samih sudionika o važnosti upotrebe odjeće i oznaka od reflektirajućih materijala u prometu te su edukacije usmjerene upravo na povećanje i unaprjeđenje prometne kulture i prometne sigurnosti. Škola se također 2019./2020. godine prijavila za financiranje projekata u sklopu izvannastavnih aktivnosti osnovnih i srednjih škola te učeničkih domova. Dobivena sredstva utrošena su na promotivne reflektirajuće materijale koji su podijeljeni svim učenicima odnosno sudionicima edukacije.

U školskoj godini 2019./2020. učenici su prvi put krenuli sa samostalnim održavanjem edukacija. Učenici su održali šest edukacija za učenike 1. razreda Škole za cestovni promet koji se obrazuju za smjer Vozač motornog vozila i Tehničar cestovnog prometa. Jedna od značajnijih edukacija koja je bila planirana za tu školsku godinu trebala se održati u Požegi. Edukacija je trebala biti održana za oko 100 učenika prvih razreda osnovne škole te za građane Požege u suradnji sa Ministarstvom unutarnjih poslova. Nažalost, edukacija je zbog novonastale situacije sa pandemijom COVID 19 morala biti odgođena.

Slika 1. Edukacija učenika 1.I razreda šk.god. 2019./2020.

Slika 2. Edukacija 1.E razreda šk.god. 2019./2020.

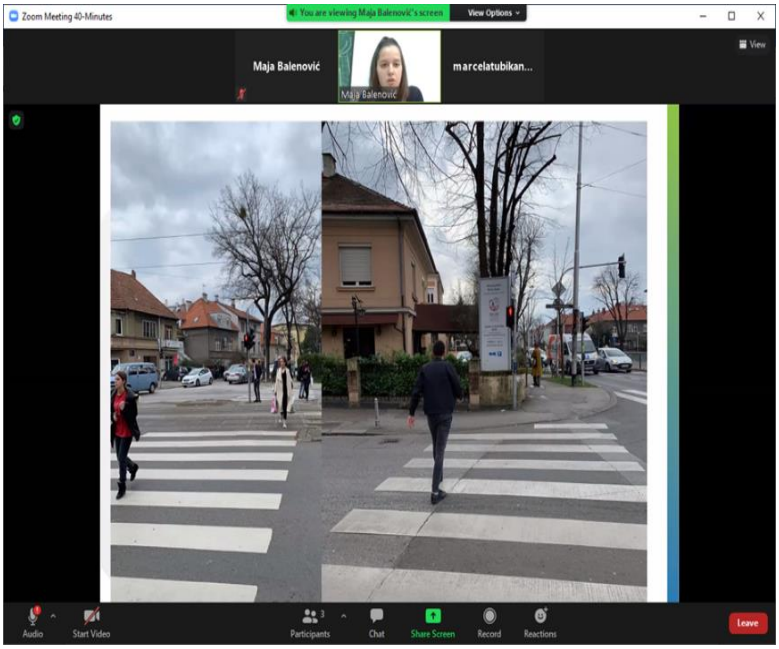
Izvannastavna aktivnost nastavila je sa održavanjem radionica i edukacija za učenike i tijekom školske godine 2020./2021. no prema preporukama Ministarstva znanosti i obrazovanja za održavanje izvannastavnih aktivnosti one su se održavale u virtualnom okruženju na platformi ZOOM. U edukacijama je sudjelovalo osam razreda iz četiri osnovne škole iz Grada Zagreba a to su:

- OŠ Žuti brijeg – dva razreda
- OŠ Dugave – tri razreda
- OŠ Markuševec – jedan razred
- OŠ Rapska – dva razreda

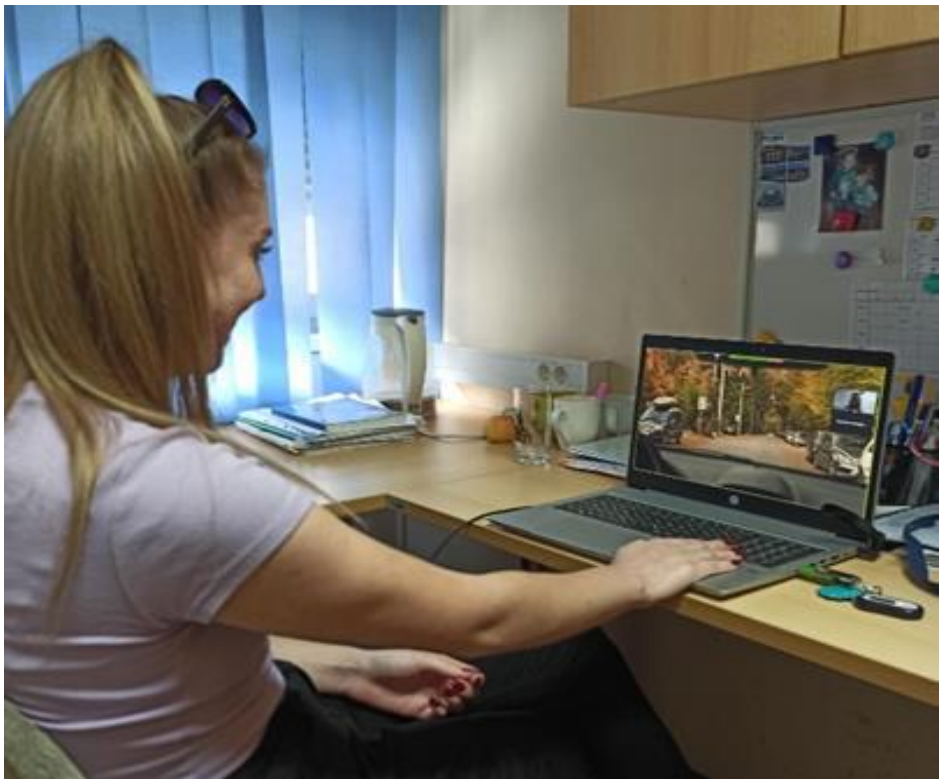
U osam razreda koji su sudjelovali u edukacijama prisustvovalo je ukupno oko 200 učenika koji su također nakon odslušane edukacije dobili reflektirajuće materijale kako bi tijekom kretanja bili uočljivi u prometu.

Slika 3. Učenici OŠ Dugave sa reflektirajućim materijalima nakon edukacije

Učenici su s obzirom na epidemiološku situaciju izazvanu pandemijom COVID 19 i novonastalim uvjetima prilagodili radionicu i održavanje iste u virtualnom okruženju. Također, novi uvjeti potaknuli su primjenu informacijske i komunikacijske tehnologije za obrazovne potrebe, učenici mogu u svojoj školi iskusiti virtualnu suradnju s vršnjacima, upravljati informacijama u digitalnome okružju, stvarati i uređivati nove sadržaje te se kreativno izražavati s pomoću digitalnih medija. Slike broj 4. i 5. prikazuju učenike koji održavaju edukacije u virtualnom okruženju za učenike osnovne škole.



Slika 4. Održavanje edukacije u virtualnom okruženju



Slika 5. Održavanje edukacije u virtualnom okruženju

4. Aktivnosti i metode izvannastavne aktivnosti

Metode poučavanja i učenja u odgoju i obrazovanju važna su tema istraživanja kod nas i u svijetu. Nastavnici bi u školskoj praksi trebali primjenjivati cijeli spektar različitih metoda kojima bi učenici usvajali znanja, vještine i vrijednosti te oblikovali svoje stavove. Međutim, da bi proces odgoja i obrazovanja bio djelotvorniji u postizanju obrazovnih postignuća učenika, odgojno-obrazovni sustavi bi trebali poticati i razvijati metode poučavanja i učenja, kojima bi se unaprijedili znanje i vještine.

Suvremena nastava temelji se na ideji aktivnog učenika koji kroz istraživanje i interakciju s drugim učenicima usvaja nove spoznaje i razvija svoje vještine. Vođeni tom idejom upravo izvannastavna aktivnost *Sigurnost pješaka u prometu* omogućuje učenicima da kroz različite metode i aktivnosti razvija multidisciplinarna znanja i vještine. Neke od aktivnosti koje učenici provode tijekom školske godine su:

- Osmišljavanje i provedba vršnjačkog anketnog upitnika
- Analiza rezultata, samostalno istraživanje relevantnih podataka za edukaciju
- Kreiranje interaktivnog predavanja/radionice
- Provedba edukacije za učenike OŠ putem interaktivne radionice
- Dijeljenje reflektirajućih materijala sudionicima edukacije
- Osmišljavanje evaluacijskog upitnika za učenike OŠ.

Primjenom metoda poput istraživačkog učenja, suradničkog učenja u timu, metoda aktivnog učenja kroz stvaranje, metoda obrnute učionice sa primjenom IKT-a i sl. kod učenika edukatora razvijaju se neke od sljedećih kompetencija:

- razvoj slike o sebi, samopoštovanja i samopouzdanja,
- razvoj socijalnih i komunikacijskih vještina, suradnje i timskog rada
- razvoj odgovornog ponašanja prema sebi i drugima u zajednici
- sposobnost kritičkog upravljanje informacijama i kreativan pristup rješavanju problema kroz različite metode učenja
- odgovorno, moralno i sigurno rabiti informacijsku i komunikacijsku tehnologiju
- razvoj kritičkog mišljenja, vještina argumentiranja i komunikacijske vještine potrebne za društveno sudjelovanje aktivnog građanstva.

5. Zaključak

Nacionalni program sigurnosti cestovnog prometa Republike Hrvatske, temeljni je dokument i platforma za podizanje razine sigurnosti cestovnog prometa u našoj državi na višu, prihvatljiviju razinu od sadašnje. On u svom operativnom dijelu obuhvaća sve subjekte kojima je djelokrug rada na neki način vezan za sigurnost cestovnog prometa. To znači da u njegovom provođenju sudjeluju ministarstva, stručne organizacije, strukovne udruge, udruge građana i svi ostali koji mogu dati doprinos postizanju spomenutog cilja. Škola za cestovni promet sudjelovanjem u mnogobrojnim aktivnostima poput *Dana ljubaznosti, Dan bez mobitela u prometu* i sl., također provođenjem nacionalnih i međunarodnih projektnih aktivnosti aktivno sudjeluje na promjenu ponašanja sudionika u prometu.

Upravo kao rezultat i nastavak nacionalnog projekta *Uoči me* nastala 2019. godine izvannastavna aktivnosti Sigurnost pješaka u prometu. Škola za cestovni promet provođenjem izvannastavne aktivnosti želi utjecati na podizanje razine svijesti i promjenu ponašanja pješaka kao najugroženije skupine sudionika u prometu. Izvannastavna aktivnost ima više ciljeva i očekivanih rezultata. Prvenstveno cilj je da učenici Škole za cestovni promet – mladi edukatori kroz aktivnosti stječu multidisciplinarna znanja i vještine te da budu pripremljeni za edukaciju drugih učenika. Aktivnim sudjelovanjem i doprinosom u realizaciji edukacija izvannastavne aktivnosti učenici stječu potpunija teoretska i praktična znanja neophodna za obavljanje njihove buduće djelatnosti. Također, jedan od ciljeva izvannastavne aktivnosti jest da najmlađi sudionici u prometu, učenici osnovnih škola koji kroz edukaciju stječu nova znanja o sigurnom kretanju u prometu, da razvijaju pozitivne stavove o važnosti odgovornog ponašanja sa aspekta uočljivosti pješaka te donošenja ispravnih odluka. Krajnji cilj i očekivani rezultat projekta je promjena ponašanja i usvajanje novih životnih navika kod korisnika čiji će rezultati biti povećanje prometne sigurnosti.

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SCHOOL FOR ROAD TRAFFIC, ZAGREB

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PEDESTRIAN SAFETY IN TRAFFIC - YOUTH FOR YOUNG PEOPLE

Abstract:

In the last decade, the Republic of Croatia has recorded a decline in traffic accidents with fatalities, but this number is still above expectations. In accordance with the tendency of further reduction of mortality on our roads, the sixth National Road Traffic Safety Plan was adopted, which is adopted by the Government of the Republic of Croatia for the period 2021-2030. years. This plan is in line with global and European guidelines in the field of road safety legislation, which emphasizes that the education of all participants will be one of the key measures to reduce the total number of accidents and fatalities on the roads.

Pedestrians are still one of the most endangered groups due to their exposure, which therefore requires special attention when analyzing traffic safety. In 2019, the School of Road Traffic implemented a project called "Before Me" which, as part of the activities, educated over 700 pedestrians about the visibility of pedestrians from 14 high schools in the Republic of Croatia. As one of the results of the project, the extracurricular activity Safety of pedestrians in traffic was created, which for the third year in a row has the main goal of educating the youngest participants in traffic, primary school children.

Keywords:

- pedestrian safety
- young for young
- education

1. Introduction

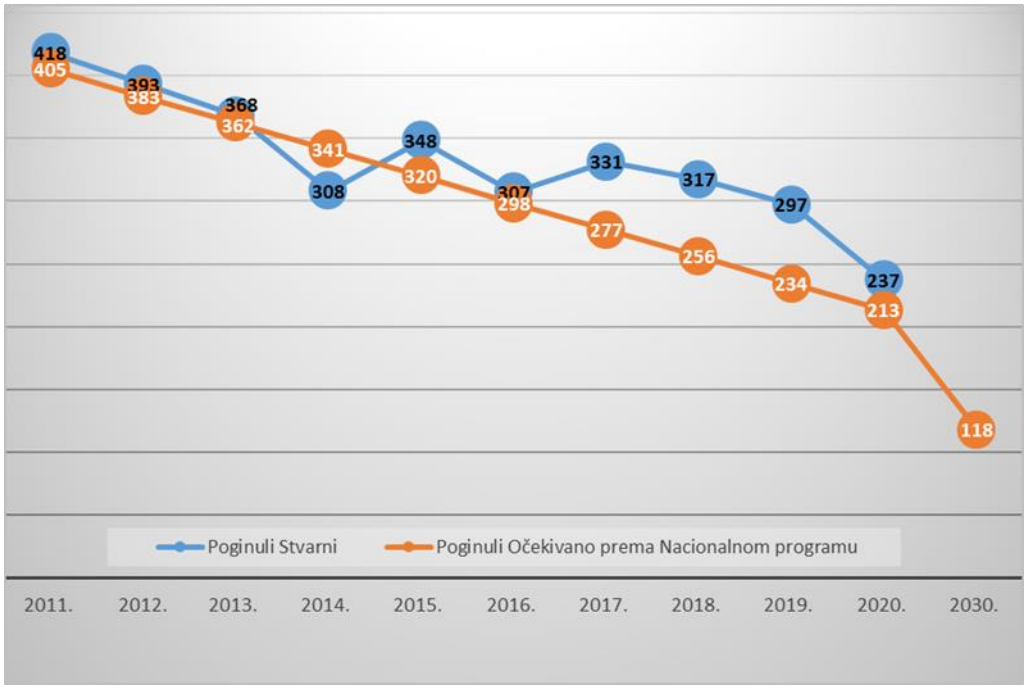
In the last decade, the Republic of Croatia has seen a decline in traffic accidents with fatalities, but this number is still above expectations. In accordance with the tendency of further reduction of mortality on our roads, the sixth National Road Traffic Safety Plan was adopted, which is adopted by the Government of the Republic of Croatia for the period 2021-2030. years. This plan is in line with global and European guidelines in the field of road safety legislation, which emphasizes that the education of all participants will be one of the key measures to reduce the total number of accidents and fatalities on the roads. Through the NPSCP, work will be done on expanding the existing and introducing new preventive-educational programs in all educational institutions, as well as conducting preventive-educational and promotional activities, emphasizing the importance of the principles of lifelong learning. The school is considered one of the key entities in charge of implementing educational measures and with this activity wants to continuously educate the youngest participants in traffic and increase awareness of students - pedestrians about the importance of using reflective materials in traffic and adopt safe living habits.

As a continuation of the successfully implemented project "See Me", the School of Road Traffic as part of the extracurricular activity Pedestrian Safety for the third year in a row wants to raise awareness and change the behavior of pedestrians as the most vulnerable groups of road users. The extracurricular activities are attended by third grade students of the School of Road Traffic who are studying for the profession of Road Traffic Technician. Students, using the knowledge and competencies acquired in regular education, through research and data collection under the supervision of the leader design an interactive lecture with a workshop for primary school students. By preventive education of younger traffic participants, children in primary schools, students participating in extracurricular activities want to influence the increase of their safety as pedestrians in traffic.

2. Analysis of traffic accidents with pedestrians

In the period from 2011 to 2020, 335,538 traffic accidents occurred on Croatian roads. 107,444 people died in these accidents: 3,324 people were killed, 27,827 people were seriously injured, and 116,881 people were slightly injured. In the same period, the number of traffic accidents with casualties decreased from 13,228 in 2011 to 7,710 (41.71%) in 2020, slightly injured from 14,656 to 7,740 (47.18%), seriously injured persons from 3,409 to 2,295 (32.67%) and the number of fatalities in traffic accidents decreased from 418 to 237

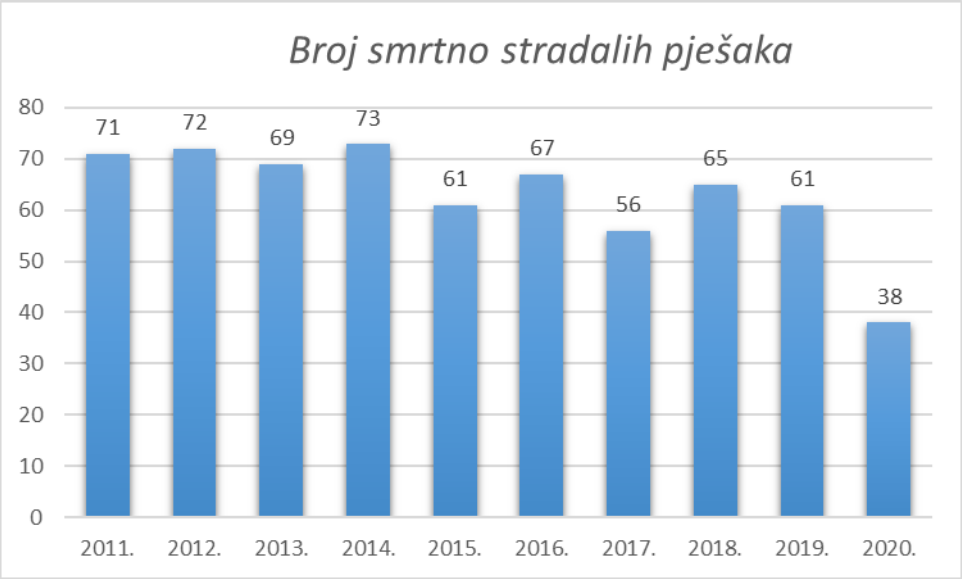
fatalities (43.3%). The number of people killed in traffic accidents in the last ten years has dropped from 418 in 2011 to 237 in 2020. Graph 1 shows that in 2020 the number of deaths decreased by 60 persons or 20.2% compared to the previous year.



Graph 1. Number of deaths in the Republic of Croatia and expected number of deaths according to the National Program

According to the Sixth National Road Safety Plan adopted by the Government of the Republic of Croatia for the period 2021-2030. activities will be aimed at improving road safety in the form of reducing the number of fatalities by 2030. The planned infrastructure improvements, prevention programs, education and overall activities will be aimed at reducing the death toll in 2030 by 50% compared to 2020.

In the period from 2011 to 2020, out of the total number of fatalities in traffic, 633 people were pedestrians, which means that almost 20% of traffic accidents with fatalities were pedestrians. Graph 2 shows that the number of fatalities of pedestrians has a tendency to fall, but all indicators should also be observed through the prism of the Covid 19 pandemic, which in 2020 greatly affected the reduction of human mobility. If we take into account the circumstances that were in force in 2020, the number of pedestrians killed is far above expectations.

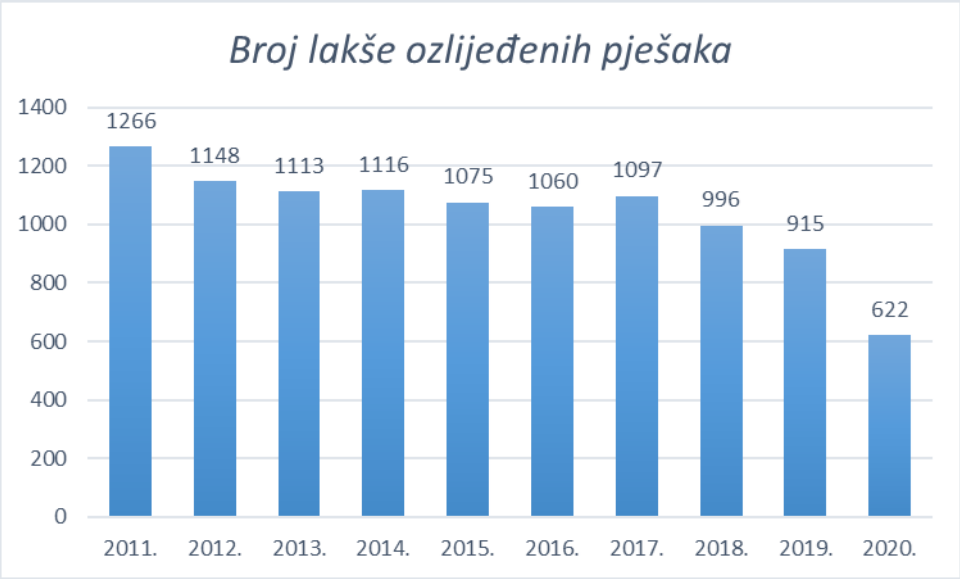


Graph 2. Number of fatalities of pedestrians in the period from 2011. to 2020.

Graph 3 shows that the number of severely injured pedestrians in the period from 2011 to 2020 was 4,552 people. In 2020, the number of severely injured pedestrians was 342, which is only 17.34% less than in the previous year and 39.78% less than in 2011.

Graph 3. Number of severely injured pedestrians in the period from 2011. to 2020.

Continuing the analysis of pedestrians killed in traffic, the number of lightly injured pedestrians can be highlighted, which in the period from 2011 to 2020 totaled 10,408 people. The number of slightly injured pedestrians in 2020 was 622, which is 32% less than in the previous 2019. However, if we take into account that in 2011 there were 1,266 slightly injured pedestrians and in 2020 622 it should certainly be noted that this number decreased by 50.86%.



Graph 4. Number of lightly injured pedestrians in the period from 2011. to 2020.

3. Extracurricular activity - Safety of pedestrians in traffic

The previously presented analysis of statistical data indicates a continuous need to improve the safety of pedestrians in road traffic, ie to improve the overall safety of road traffic. Accordingly, for the third year in a row, the School of Road Traffic is conducting an extracurricular activity Safety of pedestrians in traffic, one of the main goals of which is to prepare students - young educators for the education of the youngest participants in traffic. Extracurricular activity through which students' competencies, skills, creativity and self-confidence are developed in order to meet the various needs of students, which in accordance with their preferences, abilities and interests, encourages the development of additional specific forms of learning.

During extracurricular activities, students independently conduct research, and implement the results of the research and the collected data in an interactive workshop and education. Through the research of the field of road safety, the design of a survey questionnaire, data processing and analysis, students adopt a multidisciplinary approach to learning and problem solving. By participating in extracurricular activities, students develop critical thinking and socially responsible behavior by integrating existing and newly acquired data. By conducting trainings, students transfer the acquired knowledge to primary school students and in this way they also want to influence the improvement of road safety. One of the biggest risks for pedestrians in traffic is insufficient knowledge and awareness of the participants about the importance of using clothes and signs made of reflective materials in traffic, and education is aimed at increasing and

improving traffic culture and traffic safety. The school is also 2019/2020. applied for funding for projects within the extracurricular activities of primary and secondary schools and student dormitories. The obtained funds were spent on promotional reflective materials that were distributed to all students and participants in the training.

In the school year 2019/2020. for the first time, the students started holding independent educations. The students held six trainings for 1st grade students of the School of Road Traffic who are being educated for the direction of Motor Vehicle Driver and Road Traffic Technician. One of the most important trainings that was planned for that school year was to be held in Požega. The training was to be held for about 100 first grade primary school students and for the citizens of Požega in cooperation with the Ministry of the Interior. Unfortunately, education had to be postponed due to the new situation with the COVID 19 pandemic.

Figure 1. Education of 1st grade students - 2019/2020

Figure 2. Education of 1st grade students - 2019/2020

Extracurricular activities continued with workshops and education for students during the school year 2020/2021. however, according to the recommendations of the Ministry of Science and Education for holding extracurricular activities, they were held in a virtual environment on the ZOOM platform. Eight classes from four primary schools from the City of Zagreb participated in the trainings:

- Elementary school Žuti brijeg - two grades
- Elementary school Dugave - three grades
- Elementary school Markuševec - one class
- Elementary school Rapska - two classes

A total of about 200 students attended the eight classes that participated in the trainings, and they also received reflective materials after completing the training, so that they could be seen in traffic during the movement.

Figure 3. Students of Dugave Elementary School with reflective materials after education

Given the epidemiological situation caused by the COVID 19 pandemic and the new conditions, the students adapted the workshop and its maintenance in a virtual environment. Also, the new conditions have encouraged the application of information and communication technology for educational purposes, students can experience virtual collaboration with peers in their school, manage information in the digital environment, create and edit new content and express themselves creatively through digital media. Figures 4 and 5 show students holding trainings in a virtual environment for primary school students.

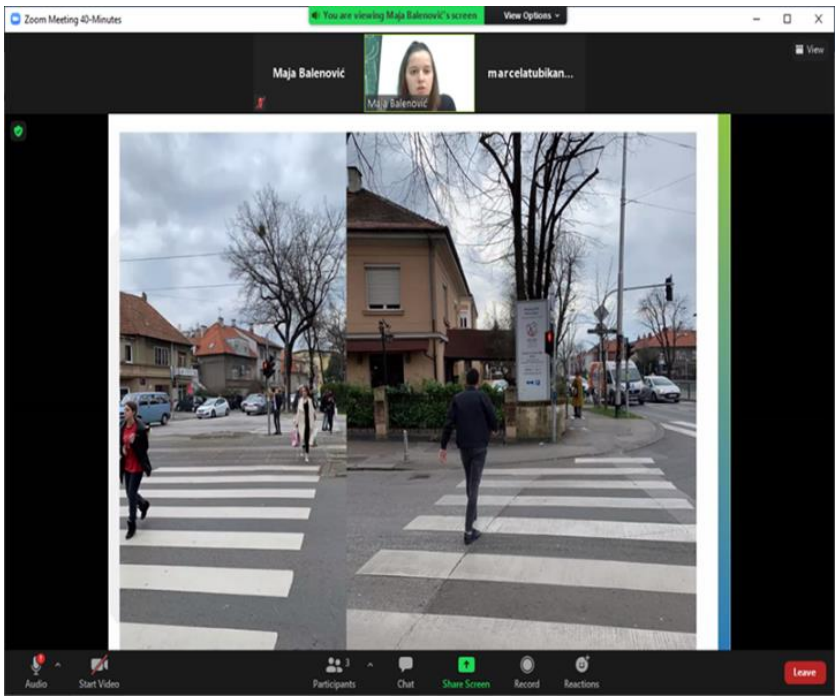


Figure 4. Maintaining education in a virtual environment

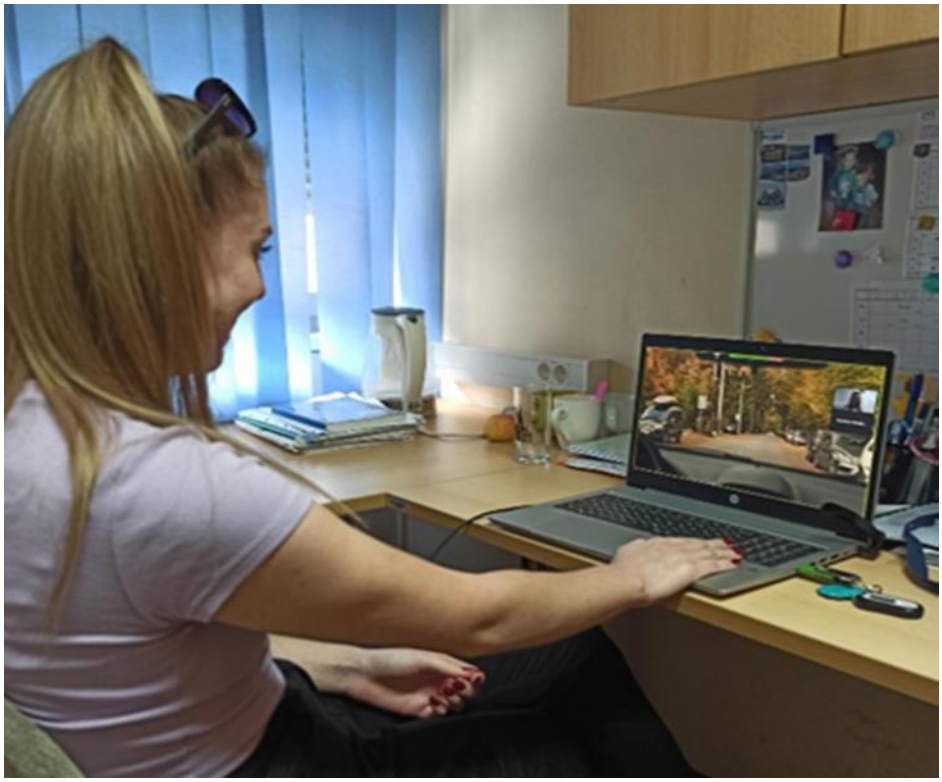


Figure 5. Maintaining education in a virtual environment

4. Activities and methods of extracurricular activities

Teaching and learning methods in upbringing and education are an important research topic in our country and in the world. In school practice, teachers should apply a whole range of different methods by which students would acquire knowledge, skills and values and shape their attitudes. However, in order for the process of upbringing and education to be more effective in achieving students' educational achievements, educational systems should encourage and develop teaching and learning methods, which would improve knowledge and skills.

Modern teaching is based on the idea of an active student who through research and interaction with other students acquires new knowledge and develops his skills. Guided by this idea, the extracurricular activity Pedestrian safety in traffic enables students to develop multidisciplinary knowledge and skills through various methods and activities. Some of the activities that students carry out during the school year are:

- Design and implementation of a peer survey questionnaire
- Analysis of results, independent research of relevant data for education
- Creating an interactive lecture / workshop
- Implementation of education for primary school students through an interactive workshop
- Distribution of reflective materials to training participants
- Designing an evaluation questionnaire for primary school students.

By applying methods such as research learning, collaborative learning in a team, the method of active learning through creation, the inverse classroom method with the use of ICT, etc., some of the following competencies are developed in students educators:

- development of self-image, self-esteem and self-confidence,
- development of social and communication skills, cooperation and teamwork
- development of responsible behavior towards oneself and others in the community
- ability to critically manage information and a creative approach to problem solving through different learning methods
- use information and communication technology responsibly, morally and safely
- development of critical thinking, argumentation skills and communication skills necessary for the social participation of active citizens.

5. Conclusion

The National Road Safety Program of the Republic of Croatia is a basic document and platform for raising the level of road traffic safety in our country to a higher, more acceptable level than the current one. In its operational part, it includes all entities to which the scope of work is in some way related to road safety. This means that ministries, professional organizations, professional associations, citizens' associations and all others who can contribute to the achievement of the mentioned goal participate in its implementation. The School of Road Traffic, by participating in many activities such as the Day of Kindness, the Day without Cell Phones in Traffic, etc., also by implementing national and international project activities, actively participates in changing the behavior of traffic participants.

Precisely as a result and continuation of the national project Before Me, the extracurricular activity Pedestrian Traffic was created in 2019. By conducting extracurricular activities, the School of Road Traffic wants to influence the raising of the level of awareness and change the behavior of pedestrians as the most endangered group of traffic participants. Extracurricular activity has several goals and expected results. The primary goal is for students of the School of Road Traffic - young educators to acquire multidisciplinary knowledge and skills through activities and to be prepared for the education of other students. By actively participating and contributing to the realization of extracurricular activities, students acquire more complete theoretical and practical knowledge necessary to perform their future activities. Also, one of the goals of extracurricular activities is that the youngest participants in traffic, primary school students who acquire new knowledge about safe traffic through education, to develop positive attitudes about the importance of responsible behavior in terms of pedestrian visibility and making the right decisions. The ultimate goal and expected result of the project is a change in behavior and the adoption of new life habits by users whose results will be an increase in traffic safety.

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POLETNA LOGISTIČNA ŠOLA – V VIDIKU NOVIH METOD POUČEVANJA LOGISTIČNIH MODULOV

POVZETEK

Projekt SLS – Summer logistics school (poletna logistična šola) se je izkazal kot izredno produktiven projekt, ne samo z vidika pridobljenih kompetenc dijakov, vendar tudi s široko paleto nabora različnih metod poučevanja logističnih modulov. Primarni namen Erasmus + projekta, SLS je poenotiti, posodobiti in povečati učinkovitost znanja dijakov logistične smeri v vseh sodelujočih partnerskih državah projekta - Sloveniji, Franciji, Hrvaški in Italiji. Predvsem sposobnost prilagajanju trgu dela je bistvena za opravljanje logističnih poklicev, pa naj bo to skladiščnik, ki potrebuje znanje iz najnovejših računalniških programov. Oziroma vodja logistike, ki mora obvladati logistično verigo in vse njene pripadajoče komponente. Zaradi današnjega konstantnega napredka je potrebno posodabljati tudi znanje in metode poučevanja s katerimi profesorji prenašajo svoje zanje na dijake ali študent s področja logistike in prometa.

Ključne besede: Erasmus + projekt, SLS – poletna logistična šola, nove metode poučevanja, logistika in promet.

1 UVOD

Posredovanje informacij še ne pomeni posredovanja znanja. Prav učne metode, ki omogočajo pravilno predstavitev informacij, so tiste, s pomočjo katerih informacije postanejo uporabno znanje za reševanje problemov. Logistika, ki kot dejavnost sledi nenehnem napredku, posledično pripravi profesorje logističnih modulov h konstantnemu izobraževanju, ne zgolj z vidika stroke temveč tudi z vidika didaktike – veda o vsebini, metodah in organizaciji dela v šolah. Seveda se zavedamo, da ni vsaka snov primerna za posamezno metodo poučevanja oziroma učno metodo, vendar je potrebno tako zanje stroke kot didaktike, da se zadeve poklopijo in uspemo motivirati naša poslušalce – dijake. Potrebno je uporabiti pravo metodo, ki se bo sovpadala z načeli didaktike, ki jih želimo doseči pri pouku.

2 OSNOVNE UČNE METODE

Didaktika kot znanstvena veda predstavlja način podajanja in posredovanja znanja na učence, dijake, študente. Stopnja motiviranosti dijakov je velikokrat odvisna prav od način podajanja oziroma od uporabe primerne učne metode. Učitelji s pomočjo ustrezne učne metode, dijakom približamo obravnavano tematiko, pa naj gre za obravnavanje nove učne snovi ali utrjevanje

znanja. Pri pouku se velikokrat učne metode prepletajo pri posamezni uri, kar je predvsem odvisno od zastavljenih učnih ciljev. Pogosto je uporaba posameznih učnih metod tudi povezana z ustvarjalnostjo samega učitelja. Avtor učbenika »Didaktika« dr. Vladimir Poljak (1974) predstavlja sedem temeljnih učnih metod:

1. metoda demonstriranja,
2. metoda praktičnih del – laboratorijsko eksperimentalna metoda,
3. metoda risanja oziroma ilustrativnih del,
4. metoda pismenih del,
5. metoda branja in dela s tekstom,
6. razgovorna metoda,
7. metoda ustnega razlaganja.

Poimenovanje posameznih metod se je skozi leta preoblikovalo. Tako lahko danes zasledimo metode, ki so strukturno enako zasnovane, vendar se njihovo poimenovanje razlikuje od avtorja do avtorja. Po učbeniku Osnove didaktike avtoric dr. Ivanuš Grmek in dr. Javornik Krečič (2011) zasledimo naslednje metode:

1. metoda prikazovanja,
2. laboratorijsko-eksperimentalna metoda,
3. metoda dela z besedilom,
4. metoda razlage,
5. metoda pogovora,
6. metoda reševanja problemov.

Prav zato je bil Erasmus+ projekt *SLS – Summer logistics school* – Poletna logistična šola, namenjen osvajanju novih kompetenc in spretnosti dijakov, ter predstavitvi *inovativnih učnih metod učiteljem*. Poletna logistična šola ali SLS je mednarodni Erasmus+ projekt, v katerem so pod vodstvom FPP – Fakultete za pomorstvo in promet, sodelovale še različne institucije ter srednje šole iz Hrvaška, Italije, Francije in Slovenije. Projekt je potekal preko različnih zaporednih aktivnostih, ob analize kurikulumov, identifikacije ciljev tečaja usposabljanja, do ključnega testiranja – izvedbe SLS-a do končne evalvacije in implementacije rezultatov v praksi pri posameznih logističnih modulih pouka.

3 IZVAJANJE POLETNE LOGISTIČNE ŠOLE - SLS

Glavni cilji projekta SLS so bili osredotočeni na izpostavitev pomanjkljivosti v vsebinah kot tudi učnih metodah, ki jih profesorji uporabljamo pri pouku logističnih modulov. Hkrati je bil namen projekta modernizacija logističnih kurikulumov, pridobivanje novih kompetenc srednješolskih dijakov v logističnih programih, ažuriranje znanja prakse učiteljev logističnih modulov. Za dosego teh ciljev smo uporabili različne pristope. Najprej smo s pomočjo SWOT analize opravili analizo trenutnih kurikulumov v srednjih poklicnih šolah na področju logistike in transporta v vseh partnerskih državah. Istočasno je potekalo intervjuvanje delodajalcev. Na podlagi dobljenih rezultatov so sodelujoče fakultete in organizacija oblikovale usposabljanje za dijake in učitelje logistične in transportne usmeritve, ki se je odvijalo v mesecu septembru v Portorožu . Usposabljanje je bilo na podlagi dobljenih rezultatov analiz, razdeljeno na pet učnih enot oziroma modulov – TM (traning modules):

1. TM1 - POMOSKI IN INTERMODALNI TRANSPORT,
2. TM2 - MENEDŽMENT OSKRBOVALNE VERIGE ZAMRZNJENIH IZDELKOV,
3. TM3 - ANALIZA SKLADIŠČNIH PROCESOV,
4. TM4 - TRANSPORTNA ORGANIZACIJA,
5. TM5 – MEDOSEBNE VEŠČINE.

Modula TM1 in TM4 sta bila obvezna za vse udeležence usposabljanja, medtem ko so ostali trije bili izbirni, sodelujoči so lahko izbrali po en izbirni modul. Trajanje obveznih vsebin je bilo 12 ur, izbirne vsebine pa so bile skoncentrirane na 8 ur. Analize obstoječih kurikulumov so pokazale pomankanje kompetenc predvsem na področju sodobnih simulatorjev in informacijsko-komunikacijskih orodij. Saj šole nimajo na voljo računalniških programov in simulatorjev, ki se uporabljajo v praksi.

Pred izvedbo SLS – Poletne logistične šole, ki je potekala v mesecu septembru, natančneje od 9.9. do 13.9. 2019 v Portorožu na sedežu Fakultete za pomorstvo in promet, je bilo potrebnih veliko predpriprav. Za nas udeležence je bilo ključnega pomena, izbor dijakov, ki so se udeležili šolanja v SLS. Pomembno je bilo, da smo izbor dijakov opravili že na koncu prejšnjega šolskega leta se pravi 2018/19, saj se je pričakovalo od dijakov, poleg dobrega znanja logistike tudi relativno dobro znanje angleškega jezika. V Poletno logistično šolo smo lahko vključili po 3 dijake iz vsake šole, ki je sodelovala v projektu. Dijake smo spremljali profesorji strokovnih logističnih predmetov. Teden SLS je bil razdeljen na tematske sklope s posameznega področja logistike. Zaključek usposabljanja je bil namenjen strokovni ekskurziji v Luko Koper, kjer smo teoretična izhodišča združili s praktičnimi.

Tabela 1: Ponedeljkov urnik usposabljanja za SLS

Day	Time	TM & Unit		Lecture room	Trainer	Observer
Monday, 9 September 2019	08:30 - 09:15	TM1_Unit 1 (Group 1 - 18 participants)	Rowing boat (Group 2 - 18 participants)	Nautical simulator/ "boathouse"	Androjna A.	Jurkovič V. Bajec P.
	09:15 - 10:00					
	10:00 - 10:15	break				
	10:15 - 11:00	TM1_Unit 1 (Group 2 - 18 participants)	Rowing boat (Group 1 - 18 participants)	Nautical simulator/ "boathouse"	Androjna A.	
	11:00 - 11:45					
	11:45 - 14:00	lunch				
	14:00 - 14:45	TM1_Unit 2 (36 participants)		Room no. 205	Beškovnik B.	
	14:45 - 15:30					
	15:30 - 15:40	break				
	15:40 - 16:25	TM1_Unit 3 (36 participants)		Room no. 205	Eleonora Tu	
	16:25 - 17:10					

Vir: VET Level 4 in Logistics and Transport – A Training Handbook

V zgornji tabeli je prikazan razpored oziroma urnik usposabljanja, glede na enoto oziroma sklope učne tematike. Zaradi prostorskih omejitev in lažjega obravnavanja tematike, so bili dijaki s svojimi mentorji razdeljeni na skupine, ki so se tekom dneva izmenjavale pri različnih predavateljih. Vsako usposabljanje sta v namene evalvacije in splošne ocene opazovala in ocenjevala dva opazovalca – observers. Njuna naloga je bila, tekom usposabljanja izpolniti obrazec, v katerega sta zapisovala mnenja in ocene o podajanju učne snovi, odzivih dijakov, znanju angleškega jezika, motivaciji dijakov, primernost tematike glede na predznanje dijakov, prostorskih zmogljivostih, uporabo učnih pripomočkov….

Sklopi so bili razporejeni po dnevih, tako smo se udeleženci v ponedeljek usposabljali v modulu *TM1 – Pomorski in intermodalni transport,* kjer smo spoznali:

- osnove pomorske navigacije (Electronic Chart Display in Information System (ECDIS), ter Automatic Radar Plotting Aid (ARPA)),
- osnovno infrastrukturo in delovanje pomorskih terminalov,
- koordinirali prihod in odhod tovornih vlakov,
- ter se usposabljali za skladiščenje kontejnerjev v cestno-železniškem terminalu, s pomočjo SIMULTRE - Simulation of Logistics and Transport Processes (simulator za organizacijo logističnih in transportnih procesov).

Osnove pomorske navigacije so bile predstavljene s pomočjo simulatorja plovbe, kjer so bili udeleženci postavljeni na ladijski most in spoznali možne scenarije dejanske plovbe. Od različnih vremenskih neprilik, do celotnega poteka plovbe s pomočjo radarske navigacije. Poleg uporabe raznolikih učnih metod je bila pri vsakem sklopu modula pomembna tudi uvodna motivacija, saj le s pravim zanimanjem dosežemo boljše znanje in razumevanje pri udeležencih. Uvodna motivacije se je razlikovala med posameznimi sklopi. Od krakih kvizov, inovativnih razdelitev udeležencev v skupine na podlagali datumov rojstva do kratkih sprostitvenih tehnik.

Sodelujoče srednje logistične in prometne šole in ustanove (zaposleni v logističnem sektorju) so si izbirni modul določile samostojno, glede na njihovo obravnavanje določene tematike v logistiki, ter povezanosti z

lokalnim gospodarstvom. Na SČČ – Srednji šoli za storitvene dejavnosti in logistiko smo posledično glede nadaljnje možnosti zaposlitve dijakov izbrali TM3 – Menedžment skladiščnih procesov.

Tabela 2:Urnik izvedbe TM3 – Menedžment skladiščnih procesov

Thursday, 12 September 2019	08:30 - 09:15	**TM2_Unit 1** Room no. 202	**TM3_Unit 1** Room no. 203	**TM5_Unit 1** Room no. 206	TM2 - Bajec P. TM3 - Rogić K. TM5 - Poredoš M.	TM2 - Šoštarič K., Tu E. TM3 - Rožanski Fidler K., Jurkovič V. TM5 - Koneke S., Beškovnik B.
	09:15 - 10:00					
	10:00 - 10:10	break				
	10:10 - 10:55	**TM2_Unit 2** Room no. 202	**TM3_Unit 2** Room no. 203	**TM5_Unit 1/Unit 2** Room no. 206	TM2 - Bardi A. TM3 - Rogić K. TM5 - Poredoš M.	
	10:55 - 11:40					
	11:40 - 14:00	lunch				
	14:00 - 14:45	**TM2_Unit 3** Room no. 202	**TM3_Unit 3** Room no. 203	**TM5_Unit 2/Unit 3** Room no. 206	TM2 - Bardi A. TM3 - Bajor I. TM5 - Poredoš M.	
	14:45 - 15:30					
	15:30 - 15:40	break				
	15:40 - 16:25	**TM2_Unit 4** Room no. 202	**TM3_Unit 4** Room no. 203	**TM5_Unit 3** Room no. 206	TM2 - Bardi A. TM3 - Bajor I. TM5 - Poredoš M.	
	16:25 - 17:10					

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TM3 – Menedžment skladiščnih procesov je bil tematsko osredotočen na skladiščne procese komisioniranja (poznavanje sodobnih tehnologij komisioniranja), spoznavanje sistema za skladiščni menedžment (WMS) in osvajanje metod za učinkovit skladiščni menedžment na podlagi parametrov kakovosti z uporabo statističnih metod. Osrednja učna metoda je bila frontalna razlaga, saj je obravnavana tematika kompleksna in je bilo potrebno udeležencem najprej razložiti osnovne pojme. Sledila je metoda »case study« – učenje s pomočjo praktičnih primerov, uporaba sistema za skladiščni menedžment in metoda video predstavite.

TM4 – Modul transportne organizacije je bil obvezen modul za vse udeležence. Poudarke tega modula je bil na organizaciji cestnega prometa, kar pomeni, da so dijaki pridobili znanje in veščine celotnega poteka načrtovanja in izvedbe prevoza. Od pravilne:

- izbire transportnega sredstva (ustrezna velikost tovornega prostora),
- izbire primerne transportne enote,
- načrtovanje optimalne transportne poti,
- nadzor nad tovorom,
- izpolnjevanje transportnih dokumentov – CMR in
- izračun stroškov.

Modul je potekal v zaporednih korakih, od osvežitve znanja udeležencev, kjer je bila učna metoda frontalni pouk. Sledilo je učenje na praktičnem primeru – »case study«, kjer so morali udeleženci rešiti zastavljen primer organizacije transporta blaga. Poleg učne metode *praktičnega primera* so udeleženci pridobili kompetence na področju IKT, uporabe simulatorja – SIMULTRA, ki je celotno transportno organizacijo predstavil z uporabo računalniškega programa. Poleg omenjenih učnim metod so dijaki uporabili svoje dosedanje znanje in pridobili nove kompetence *s pomočjo didaktičnih pripomočkov* – BUSINESS ON THE MOVE.

4 NOVE METODE PRI POUČEVANJU LOGISTIČNIH MODULOV

Poletna logistična šola je omogočila udeležencem velik nabor različnih kompetenc. Dijaki, ki so se udeležili usposabljanja so bili s strani predavateljev motivirani, prav tako so bile učne metode dovolj raznovrstne, da so pritegnile pozornost udeležencev. Usposabljanje je bilo skoncentrirano na en teden, posledično so bili udeleženci močno obremenjeni. V razredu dijaki tekom celega tedna pouka prisostvujejo različnim vsebinskim sklopom pri splošnih in strokovnih predmetih. Vsaka vsebina zahteva določene učne metode, kar pomeni, da težko izvajamo vse vsebine na enak način. Prav to, pa zahteva dobro znanje didaktike, kar pomeni, da se učitelji osredotočimo na vsebino snovi in jo predstavimo in posredujemo dijakom na najboljši način. Metode s pomočjo katerih so udeleženci osvojili kompetence v Poletni logistični šoli so izrednega pomena tudi za izvajanje pouka logističnih modulov v šoli. Na kratko bom predstavila katere učne metode so se izkazale za najučinkovitejše, pri tem pa moram poudariti, da smo v šoli omejeni s sredstvi, kot so na primer računalniški programi, hkrati pa imamo tudi prostorske omejitve.

Case study - Metoda reševanja praktičnih primerov

Učni cilji in kompetence – samostojno reševanje problemov, razvijanje samostojnega razmišljanja, priklic lastnega predznanja in izkušenj.

Potek metode – učitelj pripravi določen logistični problem – **nabava voznega parka, nabava potrebne pretovorne mehanizacije za skladišče x**, **izbira ustrezne manipulacije za logistično podjetje x**, **celotna organizacija transporta blaga.** Dijakom poda osnovne podatke, ki so potrebni za organizacijo transporta (pošiljatelj, prejemnik, prevoznik, vrsto, količino blaga, posebnosti blaga – nevarno, zamrznjeno blago, mesto prevzema in raztovora…). Dijake razdeli v skupine in spodbudi k aktivnemu reševanju zastavljenih primerov, ob tem pa seveda od njih zahteva uporabo predhodno pridobljenega znanja. Pomembno je, da se dijaki zavedajo sosledjih korakov, ki jih je potrebno opraviti v dani situaciji. Naloga učitelja je predvsem usmerjanje dijakov k pravilno rešenemu problemu.

Uporaba metode – metoda je zelo učinkovita za aktivno sodelovanje vseh dijakov v razredu, pomembno je, da imajo dijaki na voljo vse potrebne informacije, ki omogočajo rešitev zastavljenega problema. S »casom study« morajo dijaki vključiti vse svoje pridobljeno znanje, ter veščine, ki so pomembne pri reševanju problemov. Hkrati metoda omogoča medpredmetno povezovanje, saj za aktivno reševanje problem potrebujemo znanje različnih področji.

***Metoda uporabe didaktičnih pripomočkov* – BUSINESS ON THE MOVE**

Učni cilji in kompetence - razvijanje samostojnega razmišljanja, priklic lastnega predznanja in izkušenj, pojasnitev ozadja teme, samostojno reševanje problemov.

Potek metode – uporaba didaktičnih pripomočkov je značilna predvsem za prakritični pouk, zelo primeren se je izkazal didaktični pripomoček »Business on the move«, ki so nam ga predstavili v SLS, saj za področje logistike ni veliko didaktičnih pripomočkov, ki bi združevala vsa področja transporta in logistike. Od

načrtovanja poti, do izbire ustreznega transportnega sistema, do uporabe trgovinskih klavzul, zavarovanja, transportnih enot ter celo upoštevanja okolijskih standardov in povratne logistike.

Uporaba metode - za nižje letnike programa logističnega tehnika je uporaba didaktičnega pripomočka primerna kot povzetek določenega sklopa snovi. Prav tako je metoda primerna za obravnavanje novih sklopov vsebin, predvsem kjer gre za nadgradnjo že osvojenih učnih ciljev.

Slika 1: Uporaba didaktičnega pripomočka – »Business on the move« – pri pouku

Vir; Lasten

Metoda opisovanja slik

Učni cilji in kompetence - samostojno razvijanje strokovnega besedila, razvijanje samostojnega razmišljanja, priklic lastnega predznanja in izkušenj, pojasnitev ozadja teme, odkrivanje abstraktnih tem.

Potek metode - učitelj pripravi glede na obravnavano učno snov slike/fotografije določenih predmetov. Razpostavi jih v krogu. Učenci nato s pomočjo igralne kocke izberejo sliko, ki jo morajo opisati ali kaj se na sliki dogaja ali opis predmeta, pojava, pojma. Učenci se nato zvrstijo. Na primer pri strokovnem predmetu uporabimo slike pretovorne mehanizacije (viličarje, konvejerje, dvigala, žerjave).

Uporaba metode - metoda je primerna za manjše skupine dijakov, ker zahteva koncentracijo vseh prisotnih. Seveda je trajane izvedbe odvisno od števila slik, ki jih imamo na voljo. Metoda je primerna pri pouku tujih jezikov, kjer morajo dijaki opisati predmet/pojem ali dejanje v tujem jeziku. Pomanjkljivost te metode je, če več dijakov opisuje isto sliko.

Slika 2: Metoda opisovanja slik pri pouku TRS - transportnih sredstev.

Vir: Lasten

***Metoda uporabe računalniških aplikacij/ simulatorjev* - KAHOOT!, SIMULTRA**

Učni cilji in kompetence - osredotočenje posameznika na nalogo, razumevanje informaciji, spoznavanje rešitve vsebinskih problemov za proces, preverjanje usvojenega znanja.

Potek metode - posamezne sodobne metode so podprte v okviru modernih aplikacij in naprav. Simulator pri pouku predstavlja dodano vrednost h kakovosti same izvedbe pouka, saj dijakom omogoča praktični prikaz realne situacije v logistiki. Šole, ki so opremljene s simulatorji, pa naj bodo to simulatorji varne vožnje, skladiščnih procesov ali pomorski simulatorji plovbe, močno izboljšajo zaznavanje in kompetence dijakov, da se preizkusijo v dejanskih situacijah. Poleg simulatorjev poznamo še raznovrstne računalniške aplikacije, ena izmet teh je Kahoot – računalniški program, ki omogoča izvajanje kratkih kvizov pri katerih lahko sodeluje več udeležencev hkrati. Učitelj sestavi kviz na obravnavano učno temo, ki ga nato učenci s pomočjo pametnih mobilnih telefonov rešijo pri uri pouka.

Uporaba metode - metoda uporabe simulatorja je primerna za manjše skupine dijakov, saj je pomembno, da se dijaki zvrstijo pri uporabi simulatorja. Medtem ko so računalniške aplikacije kot je Kahoot primerne za večje skupine dijakov. Zahtevani pogoj je dostop do interneta ter pametni mobilni telefon. Dijaki se v igro radi vključijo, saj igra prikaže rezultate tekmovalcev. Metoda je primerna za ponovitev obravnavane snovi ali za začetek nove sklopa snovi, saj lahko na ta način preverimo predznanje dijakov.

Slika 3: Uporaba simulatorja varne vožnje na predstavitvi SŠSDL

Vir: http://sdl.sc-celje.si/predstavitev-sole-v-planetu-tus/ (10.6.2020)

5 ZAKLJUČEK

Glavni primanjkljaj, kar se tiče kompetenc naših dijakov in se pojavlja v praksi je pomankanje znanja in uporabe naprednih računalniških programov. Žal šole nimajo dovolj oziroma na splošno niso tehnološko dovolj opremljene, da bi lahko nudile širok spekter znanja in uporabe vseh IKT programov, ki se nahajajo na tržišču.

Prav zato je vključevanje dijakov in učiteljev strokovnih modulov v projekte, ki podpirajo in omogočajo pridobivanje kompetenc s področja IKT ter simulatorjev ključna za uspešno delovanje na področju logistične stroke. Tržišče je postalo zasičeno z najrazličnejšimi programi, ki olajšajo delovanje logističnega in prometnega sektorja, saj so baze podatkov, ki so potrebne za celotno organizacijo, prevoza in logistike ogromni. S tem pa je poklicno šolstvo na preizkušnji, saj izobražujemo dijake za potrebe gospodarstva, ki brez sodobne IKT ne more učinkovito konkurirati na mednarodnih tržiščih. Tako je potrebno zagotoviti tudi javnim šolam dostop do omenjenih programov, bodi si preko mednarodnih projektov, kot so Erasmus+, SIMULTRA ali drugi. Poleg dostopa programov in simulatorjev je istočasno potrebno tudi izobraževanje učiteljev za omenjene programe. Učitelji so s pedagoškimi in strokovnimi kompetencami posredovalci tako znanja kot tudi veščin. Delodajalci namreč niso usposobljeni pedagogi, ki bi didaktično svoje uslužbence poučevali glede načina uporabe omenjenih programov. Le s kombinacijo obojega bomo dosegli željene rezultate. Maturante, ki bodo usposobljeni, pripravljeni in motivirani za delo v logističnem sektorju.

6 VIRI IN LITERATURA

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SUMMER LOGISTICS SCHOOL – IN ASPECT OF NEW TEACHING METHODS FOR LOGISTICS SUBJECTS

ABSTRACT

SLS project – Summer logistics school has proven as a great project, from many point of view. Not only did the students gained different logistics competences but also the teachers gained a lot of experience with modern teaching methods. The main purpose of Erasmus + project SLS (summer logistics school) is to standardize, modernize and enhance the knowledge of students when it comes to logistics in all participating countries of the project - Slovenia, France, Croatia and Italy. The most important skill which students obtain during their education is the flexibility of solving problems and the adaptability to the field of logistics, nonmatter which profession they will choose. The knowledge of warehouse systems when working in a warehouse or understanding the complexity of a supply chain when employed as head of logistics. The technology is becoming more and more important in our life's, therefor the need to train the teachers who are responsible for the logistics field is a necessity.

Key words: Erasmus + project, SLS – summer logistics school, new teaching methods, logistics and transport.

1 INTRODUCTION

The intercession of information with others thus not necessarily mean that the students will understand or even gain knowledge. When passing on information we need to understand, how the information is received by the listeners in our case the students. For this purpose, we use different teaching methods, which help transfer information into useful knowledge and further on, to use that knowledge to solve problems. Logistics is modernizing and developing by the hour, so the teachers of logistics subject, need to be up to date with all the new technologies in logistics, but not only that, we need to use different teaching methods, which are covered by didactics – the science of teaching content, methods and organization of work in schools, to motivate our students.

2 BASIC TEACHING METHODS

The didactics as a science represents a way of passing on the knowledge from teachers to students. How the students are motivated, can mainly depend on the correct use of a teaching method, which is suitable for the subject or contents. The teaching method helps the teacher to present the contents of new learning objective, to the students on the level that they can understand it. In the class room we can use different teaching methods during one period of lesson, it all depends on the creativity of the teacher and on the contents of the subject. The author of the schoolbook "Didactics" by doc. Vladimir Poljak (1974) presents seven basic teaching methods:

1. the method of demonstration,
2. the method of practical work – laboratory experimental method,
3. the method of illustration,
4. the method of writing work,
5. the method of reading and working with text,
6. discussion method,
7. the method of verbal explanation.

The naming of individual method has changed through the years. Therefore, we know methods that are structural the same but the naming is different from author to author. From the schoolbook "The basic of didactics" by doc. Ivanuš Grmek and doc. Javornik Krečič (2011) we have methods:

1. the method of presentation,
2. laboratory – experimental method,
3. the method of working with text,
4. the method of explaining,
5. the method of conversation,
6. the method of problem solving.

Therefor the main purpose of the Erasmus+ project SLS, was to gain new competence and skills for students and to present new innovative teaching methods to logistics teachers. The SLS project is an international project where under the leadership of FPP – Faculty of maritime and transportation have participated different institutes and VET schools from Slovenia, Croatia, France and Italy. The project incorporated different activities. In the beginning we needed to analyse our curriculums and identified the main goals of the training. The focus of the project was to establish which training modules we need to train in the SLS and the performance of the training – Summer logistics school. At the end we evaluated the hole project and its activities and implemented the results in practise in our school classes.

3 TRAINING PROGRAM – SUMMER LOGISTICS SCHOOL

The main goals of the SLS project were focused on updating skills and to raise the level of competences in the field of VET in logistics and transportation. Our main idea was to modernize the curriculums of the logistics in secondary school, but also to bring up to date the knowledge on the quality of teachers at secondary logistics and transport schools. To reach these goals, we used a four-step approach. In all started with, a SWOT analysis of the current curricula in all the participating countries. Then the current and future needs of the logistics industry were identified. The results helped us to establish a training programme for students and teachers of VET in logistics and transport in order to reduce or minimise the identified weaknesses of the analysed curricula. The training programme, which would take place in Portorož in September, consists of five relevant training modules (TMs):

1. TM1 - MARITIME AND INTERMODAL TRANSPORT,
2. TM2 - SUPPLY CHAIN MANAGEMENT OF COLD PRODUCTS,
3. TM3 - WAREHOUSE ANALYSIS,
4. TM4 - TRANSPORT ORGANISATION,
5. TM5 - KEY SOFT SKILLS.

The modules TM1 and TM4 ware mandatory for all participants, meanwhile were the remaining three optional, but only one of the optional could be chosen by the participants. The duration of mandatory module was 12 hours. The contents of the optional training modules was concentrated on 8 hours. The analysis of the current curriculums has shown, that the main insufficiencies coverage of competence is on the field of modern simulators and information-communications tools. This is manly doo to the lack of funds, because schools are not equipped with such simulators and different computer’s programs.

Before attending the training program SLS, which had taken place in Portorož on the premises of the Faculty of maritime and transportation, in the month of September more precisely from 9th to 13th of September, there were many preparations that must had been made. For the participating countries, it was a key element that we pick the appropriate students who will attend the training. The students had to be good in the knowledge of logistics and speak fluently English. We had to make the selections of the students by the end of the school year of 2018/19. We could apply three students from each school and two teachers of practical subjects were accompanying them. The training week was divided in to sections. The conclusion of the training was organized as a field trip to Luka Koper, where we combined the theoretical with the practical.

Table 1: Mondays timetable for SLS

Day	Time	TM & Unit		Lecture room	Trainer	Observer
Monday, 9 September 2019	08:30 - 09:15	TM1_Unit 1 (Group 1 - 18 participants)	Rowing boat (Group 2 - 18 participants)	Nautical simulator/ "boathouse"	Androjna A.	Jurkovič V. Bajec P. .
	09:15 - 10:00					
	10:00 - 10:15	break				
	10:15 - 11:00	TM1_Unit 1 (Group 2 - 18 participants)	Rowing boat (Group 1 - 18 participants)	Nautical simulator/ "boathouse"	Androjna A.	
	11:00 - 11:45					
	11:45 - 14:00	lunch				
	14:00 - 14:45	TM1_Unit 2 (36 participants)		Room no. 205	Beškovnik B.	
	14:45 - 15:30					
	15:30 - 15:40	break				
	15:40 - 16:25	TM1_Unit 3 (36 participants)		Room no. 205	Eleonora Tu	
	16:25 - 17:10					

Source: VET Level 4 in Logistics and Transport – A Training

In the table above we can see the layout of the training of SLS by the unit or module TM1. Doo to the lack of space which was available for the training and to provide better understanding of the topics, were the students and their mentors divided into smaller groups. Each individual section was observed by two observers, for the purposes of the evaluation and general assessment. The observers were given a form of general questions to fill, like to evaluate the knowledge of English, the motivation of students, the use of didactic accessories, the presentation of topics.

The modules were divided in to five days, on Monday we had classes on *TM1 – Maritime and intermodal management*, where we learned about:

- assessing the main parameters for navigation (Electronic Chart Display in Information System (ECDIS), and Automatic Radar Plotting Aid (ARPA)),
- recognising the main infrastructures and vehicles of maritime ports,
- coordinating the arrival and departure of freight trains,
- managing the storage of UTIs at the rail-road terminal with the help of the SIMULTRA simulations.

The basic of the maritime navigations were presented with the help of nautical simulator. The students were in the role of the captain and had to navigate the ship on open sea in different weather conditions. Each module was presented by a variety of different teaching methods and also the introductory motivation played an important role, to prepare students for training. The participants were motivated by playing short games, to get a better start they were though have to be relaxed and more focused on the subject.

The participating VET secondary schools and institutions related to logistics and transportation, chose the optional modules based on the work they have done in school and to which branch of logistics are they most closely connected in their local environment. We at the Secondary school of services and logistics choose *TM3 – Warehouse analysis*, based mostly on the competences which the employers are looking for in their workers.

Table 2: The timetable of TM3 – Warehouse analyses

Thursday, 12 September 2019	08:30 - 09:15	**TM2_Unit 1** Room no. 202	**TM3_Unit 1** Room no. 203	**TM5_Unit 1** Room no. 206	TM2 - Bajec P. TM3 - Rogić K. TM5 - Poredoš M.	TM2 - Šoštarič K., Tu E. TM3 - Rožanski Fidler K., Jurkovič V. TM5 - Koneke S., Beškovnik B.
	09:15 - 10:00					
	10:00 - 10:10	break				
	10:10 - 10:55	**TM2_Unit 2** Room no. 202	**TM3_Unit 2** Room no. 203	**TM5_Unit 1/Unit 2** Room no. 206	TM2 - Bardi A. TM3 - Rogić K. TM5 - Poredoš M.	
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	11:40 - 14:00	lunch				
	14:00 - 14:45	**TM2_Unit 3** Room no. 202	**TM3_Unit 3** Room no. 203	**TM5_Unit 2/Unit 3** Room no. 206	TM2 - Bardi A. TM3 - Bajor I. TM5 - Poredoš M.	
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	15:30 - 15:40	break				
	15:40 - 16:25	**TM2_Unit 4** Room no. 202	**TM3_Unit 4** Room no. 203	**TM5_Unit 3** Room no. 206	TM2 - Bardi A. TM3 - Bajor I. TM5 - Poredoš M.	
	16:25 - 17:10					

Source: VET Level 4 in Logistics and Transport – A Training

TM3 – Warehouse analysis was focused on the calculation and assessment of basic warehouse (key performers) KPIs. It also presented the proper use of WMS – warehouse management systems. In terms of the applied methodology, direct instruction was used to present warehouse processes (arrival of units into a warehouse, identification of units, assigning storage locations, the put-away process, replenishment, picking, and dispatch) and equipment, including its operation and use. Frontal method was the main teaching method use in this TM, because of the complexity of the topic presented. There was also the use of Case studies and video presentations.

TM4 – Transport organization was a mandatory module for all the participants of the SLS. This TM addresses the organisation of a transport mission by road and therefore, focuses on all the details that are involved in the preparation of a road transport mission, such as:

- selecting the appropriate type of vehicle (concerning the volume, weight),
- selecting the appropriate type of unit,
- planning of the optimal route,
- monitoring of the transport mission,
- filling in the transport document (CRM), and
- calculating the costs.

TM4 was at the beginning presented by frontal teaching method, in order to refresh the participants' knowledge and provide the necessary information, that will later on enable them, to understand real-life case studies and carry out practical tasks and applications. The students ware then given authentic parameters to solve a case study (problem solving). Besides case study the trainee's giant the competences on the computer programs and simulators SIMULTRA. A norther teaching aid motivated them, the didactical game BUSINESS ON THE MOVE.

4 NEW TEACHING METHODS IN LOGISTICS MODULES

Summer logistics school has presented a huge aspect of different competence to the students. Students who were involved in the training were motivated by the speakers. The lectures also used a wide range of different teaching methods to attract their attention. The training was concentrate on one week, this presented a challenge to the trainees in the way of staying alert, motivated and enthusiastic.

We must take in count that the school work consists of different subjects, which include general and logistics modules. Therefore, the teacher has to chose the appropriate teaching method, which represents the subject at hand at a best way. To be able to work with a variety of teaching methods, one must be a professional in his or her filed and know a lot about didactics. It is not enough to understand and pass on the information about logistics, but a teacher must be qualified to pass the knowledge, on to the students in a correct way. The teaching methods used in SLS are of great importance to us teachers, because they can be used in everyday classrooms. Further on, I will describe and present a few of the teaching methods which have been proven to work the best in an ordinary classroom. I have to point out, that in the school we are limited with the founds such as computer programs and also we have some space limitations.

Case study – problem solving

Learning goal and competence – self initiative solving problems, developing independent thinking, recall ones' prior knowledge and experience.

The course of the method – the teacher prepares a specific logistical problem – to purchase the loading mechanization for warehouse, to organize the transport of freight from A to B, to define the correct manipulation for a logistics company x, etc. The teacher presents the students with all the necessary information they need to solve the problem. For instance, to organize the transport of freight, the students need the senders and the recipient's adders, who will be the transporter, what kind of freight are we transporting – dangers goods, frozen goods, etc. After the students get all the necessary information they are divided in to groups – depending on how many are in the class. Students can use all the technology which is available to them – smart phones, computers, but it is essential that they understand all the necessary steps that need to be taken. The teacher's role is to guide the students to solve the problem.

Application of the method – the method is very useful to actively engage all the students in the classroom. This method demands from the students to be active and use all prior knowledge from different school subject and combine it. To efficient sole a problem we need to engage the knowledge form different subjects.

The method of didactical accessories – BUSINESS ON THE MOVE

Learning goal and competence – self initiative solving problems, developing independent thinking, recall ones' prior knowledge and experience, the ability to explain the background of the subject.

The course of the method – the use of didactical aid is typical for practical lessons. But when it comes to logistics, it is sometimes hard to explain to the student all the characteristics that are involved in a transport

process. So therefor, it is very useful to use different game like teaching aids to help the students understand all the transport systems. BUSINESS ON THE MOVE was presented to us in the course of the SLS training program and can be used in classroom with now specific terms. This teaching aid is especially important because it combines different areas of interests in logistics and transportation. From planning the optimal transport route, to the right choice of means of transport, the correct incoterms clauses, insurance, to the consideration of the environment taxes.

Application of the method – for minor classes of the program logistician technician this teaching aid, is useful to summaries a particular subject. For upper classes it can be used as an exercise to practise skill and incorporate all the teaching lessons.

Picture 1: The use of didactical aid – Business on the move – in class

Source: Own.

The picture method - method of describing pictures

Learning goal and competence – self initiative developing professional text, representing abstract teams, problem solving, developing independent thinking, recalling ones' prior knowledge and experience, the ability to explain the background of the subject.

The course of the method – depending on the topic of the school subject the teacher chooses a couple of pictures, which represent the topic (ship, engine, bill of lading, vehicle…). The pictures are then placed on the floor in a circle, for the students to choose a picture, by the throw of the dice. The student's assailment is to describe the picture; may it be an object or a logistic concept.

Application of the method – this method is suitable for smaller groups of students, because it depends on the concentration of all participants. But it also depends on the number of pictures we present. The method is very suitable for foreign language subjects, where the students need to describe an object/concept in foreign language.

Picture 2: The method of describing pictures by the subject Means of transport.

Source: Own.

SIMULTRA, KAHOOT! – the method of computer applications/simulators

Learning goal and competence – focus on individual tasks, understanding given information, understanding the results of a problem, problem solving, developing independent thinking, recalling ones' prior knowledge and experience.

The course of the method – some modernized teaching methods are backed up by computer applications and simulators. The simulators are a good asset to represent a specific topic of logistics. May it be a simulator of road safety or maritime navigation. The use of simulators presents a real situation for the students do deal with. The competence and skill gained through the use of such simulators are good practise of real work environment. Beside the simulator there are many computer programs or applications that help to assess the knowledge of a student. Such an example is KAHOOT – a computer program, where the teacher forms a quiz for the students to solve using their mobile phone.

Application of the method – the simulators are effective when all the students can practise on them. Because the simulators are expensive is this method more suitable for smaller groups of students. Meanwhile the computer applications such as Kahoot can be used on a full size class. The methods of using computers works very well amongst students, because they are used to modern technologies. It also presents situation of a real working place.

Picture 3: The use of simulator of safe driving on the presentation of SŠSDL.

Source: http://sdl.sc-celje.si/predstavitev-sole-v-planetu-tus/ (10.6.2020)

5 CONCLUSION

The SLS project has shown that the main deficit, when it comes to competence and skill of our students is the skill of using enhanced computer programs. The reason to this lies in the resource the schools have or to be more exact, the lack of money to purchase such computer programs. Therefore, the involvement of students and teacher in projects that include presentation of modern computer programs is essential. The logistics and transportation field of work nowadays incorporates many varieties of different computer program, which present a structural information base for the logistics workers. This presents an obstacle for our VET school system, because we educate the students to be active in the labour market and without this competences and skills they can't be competitive. The solution to this problem is to give the public schools access to previously mentioned programs, may it be through project suck as Erasmus+ SLS, SIMULTRA or others. Although the access to this kind of programs is excellent, it is not enough, because simultaneously to this, we need to educate the teachers of logistics modules on the proper use of the programs. The teachers with their knowledge of both theoretical and didactical skill, are the mediators of those competences to the students. The employers are not skilled in the didactics, to teach their workers, on the use of all the computer tools. Only with the combination of both, will we achieve the much needed results. The graduates, which will be competent, ready and motivated to work in the field of logistics and transportation.

6 LITERATURE

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SREDNJA EKONOMSKA ŠKOLA U SARAJEVU

Vildana Čelić, dipl.oecc.

SREDNJA ŠKOLA ZA SAOBRAĆAJ I KOMUNIKACIJE SARAJEVO

Sabahudin Solak, dipl.ing.saobracaja

OBRAZOVNI SISTEMI

SAŽETAK:

Obrazovanje u Bosni i Hercegovini, ali i regionu Zapadnog Balkana, se suočava se sa velikim problemima i izazovima, a rješenje nije lako naći. Već dugo vremena se razmatra mogućnost "dualnog obrazovanja", cjeloživotnog učenja, razvijanja kritičkog mišljenja, primjeni stečenih znaja u realnom životu i okruženju, čime bi se stvorila potpuna integracija svih sistema, a odbacila neupotrebljiva znanja, koja mladi ljudi, većinom, stiču kroz postojeće obrazovne sisteme. Osnovni problemi jesu glomaznost i tromost postojećih obrazovnih sistema, koji u turbulentnom, svjetskom okruženju, teško ili gotovo nikako ne priznaju promjene. Tom promjenom bi se kreirao ambijent kvalitetnijeg obrazovanja, rada, življenja i funkscionisanja privrede u cjelini, što u krajnjem slučaju pokazuju i rezultati PISA testiranja, OECD-ove preporuke, te vodeći obrazovni sistemi u svijetu.

Ključne riječi: obrazovni sistemi, cjeloživotno učenje, kritička misao, turbulentno okruženje, globalizacija, OECD, PISA

„Obrazovanje je skupo, ali je neznanje još skuplje“

Claus Moser

UVOD

Obrazovni sistemi predstavljaju kompleksniji i širi pojam od školskog sistema, jer u sebi sublimiraju i institucionalni, školski sistem, ali i sve ostale oblike vaninstitucionalnog obrazovanja, kroz permanentno, kontinuirano i cjeloživotno učenje.

Sami obrazovni sistemi, bilo koje geografske regije i područja, konstantno prolaze kroz određenu vrstu promjena, kao, uostalom, i svi sistemi u kojima egzistiramo i djelujemo.

Obrazovni sistemi kakve poznajemo, uz manje izmjene, kozmetičkog karaktera, nastali su u jednom drugačijem vremenu i prostoru, bez masovne globalne interakcije, u vremenu industrijskog perioda, kada je i samo podučavanje i prenošenje znanja, vještina i dobrih praksi, te asorpcija i reprodukcija istih, bili u skladu tog vremena, koje je, zaista, bilo puno drugačije od ovog današnjeg. Od tada se dosta toga promjenilo. Potrebno je početi razmišljati na globalnom nivou, izvan okvira postojećih, tromih, obrazovnih sistema.

Kako je pokazao period iza nas, period Pandemije COVID-19, i period totalnog lock down-a, cijeli obrazovni svijet, kroz različite sisteme pristupa i sprovođenja edukacije, suočio se sa novim izazovom koji je, u suštini, promjenio postojeće percepcije, shvatanja i pristupe u sprovođenju edukacije. Po prvi put smo se u ovom vremenu, globalno, suočili sa tzv. „on-line obrazovanjem“. Formalna učionica i frontalni oblik rada su u potpunosti ostali „stvar prošlosti“. Kakvo će obrazovanje kroz svoje obrazovne sisteme imati određena geografska područja i nove generacije zavisit će od svakog pojedinca, koji će svoj rad ugrađivati u sisteme obrazovanja i tako stvarati nove vrijednosti.

„Obrazovanje je naš pasoš za budućnost, jer sutrašnjica pripada onima koji se za nju spreme danas.“

Malcom X

OBRAZOVNI SISTEMI

One regije, države, te, samim tim, i obrazovni sistemi, koji uspiju da prepoznaju da im je obrazovni sistem i njegova stalna reforma, te konstantno prilagođavanje mladom čovjeku od najranijeg djetinjstva, kroz cjeloživotno učenje i sticanje vještina, najvažniji resurs, zaista će biti sretni u budućnosti. Znanje je moć. Ne trebamo tražiti načine kako da poboljšamo postojeće obrazovne sisteme, već, generalno, trebamo promjeniti percepciju, te krenuti u unapređenje obrazovanja kroz stvaranje potpuno novog sistema obrazovanja.

Iako se to čini teško ostvarivim, koncept je, upravo, tu, u našim rukama. Podsjetnik u vidu pandemije, koja je promjenila, uveliko, tradicionalno shvatanje obrazovanja i stvorila prodor u primjeni novih ideja u samom sistemu obrazovanja, mijenjajući ga iz korijena, te stvarajući novo okruženje, implementacijom novih ideja, kroz jedan masovni kolektivitet, koji je planetarno zahvatio sve obrazovne sisteme. Desila se jedna kolektivna saradnja učitelja, razmjena iskustava, primjena dobrih praksi, fleksibilnost u smislu unapređenja obrazovnog sistema kroz experimentalnu nastavu, dinamičnu nastavu, koja ne stagnira, koja se stalno mijenja.

Ne treba „rušiti“ postojeće obrazovne sisteme, već nastaviti sa kolektivnom sviješću o kolektivnom obrazovnom sistemu, koji se svakodnevno mijenja i unapređuje, kroz globalnu razmjenu prihvatljivih obrazovnih praksi. Jedna od osnovnih pokretačkih snaga u obrazovnim sistemima jeste sinteza globalnog akumuliranog iskustva i njegove svakodnevne razmjene. Znanje je jedina stvar na svijetu koja se dijeljenjem umnožava.

Kroz primjenu novih tehnologija i metodologija obrazovni sistemi se svakodnevno poboljšavaju, dorađuju i napreduju. Iskustva obrazovnih sistema različitih regija doprinose do ogromnog volumena znanja

i vještina, koje na specifičan načinprenosimo mladoj populaciji, kojoj su pored teoretskih znanja neophodne vještine i metodologije primjene tih znanja u samoj praksi i realnom životu, te načini, kako njihove školske dane učiniti što kvalitetnijim u svakom segmentu, stvarajući buduće generacije stručnih ljudi okrenutih ka cjeloživotnom učenju, i samom načinu i metodologiji „know-how“.

OECD i PISA testiranja

OECD, društveno odgovorna organizacija, **organizacija za ekonomsku saradnju**, nastala davne 1960.godine, kao nasljednik organizacije za europsku ekonomsku saradnju u sklopu Maršalovog plana, jeste organizacija konsultantskog, neobavezujućeg karaktera, do čijeg mišljenja drže i čije smjernice prate sve najrazvijenije zemlje svijeta, pokrenula je 2000. godine **PISA (Program za međunarodnu procjenu postignuća učenika)** istraživanje i testiranje, u cilju jasnog i tačnog pregleda, koliko, unutar različitih obrazovnih sistema, učenici u potpunosti razumiju ono što uče i što bi trebao biti cilj i ishod svakog obrazovnog sistema. Fokus je stavljen na koji način učenici „izvlače“, razumiju i pamte sadržaje i izvode zaključke, te sublimiraju znanje. Akcenat je, prvenstveno, na razumjevanju sadržaja, te način, kako doći do ishoda, koji će služiti kao zaključak i preporuka prema različitim obrazovnim sistemima, u cilju izmjene i poboljšanja određenih segmenata i elemenata postojećeg obrazovnog sistema.

PISA testiranja sprovode se svake tri godine, od 2000.godine, u preko sedamdeset zemalja širom svijeta, na način da se srednjoškolci, petnaestogodišnjaci, testiraju u oblastima razumjevanja teksta, matematike i nauke, te od 2015.godine i timskog rješavanja problema.

Što se tiče Bosne i Hercegovine i testiranja koja su provedena u 2018.godini iz gore pomenutih oblasti, a u organizaciji OECD-a, učenici BiH su se pridružili grupi više od pola miliona testiranih učenika iz 79 zemalja širom svijeta.

Cjelokupni rezultati, za sve zemlje koje su učestvovale, objavljeni su u Sarajevu, 3. decembra 2019. godine., a BiH se našla na 62. mjestu od 79. zemalja koje su učestvovale. Konstatovano je da su učenici u BiH iz svih oblasti testiranja, u prosjeku, tri godine iza školovanja svojih vršnjaka u zemljama koje imaju napredne obrazovne sisteme.

Izjave koje smo mogli pročitati u medijima tih dana, ali i zvanične izjave, glasile su:

“Rezultati su za za nekog očekivani, za nekog šokantni, i jasno je da je potrebno poduzeti značajne korake ka poboljšanju obrazovanja”

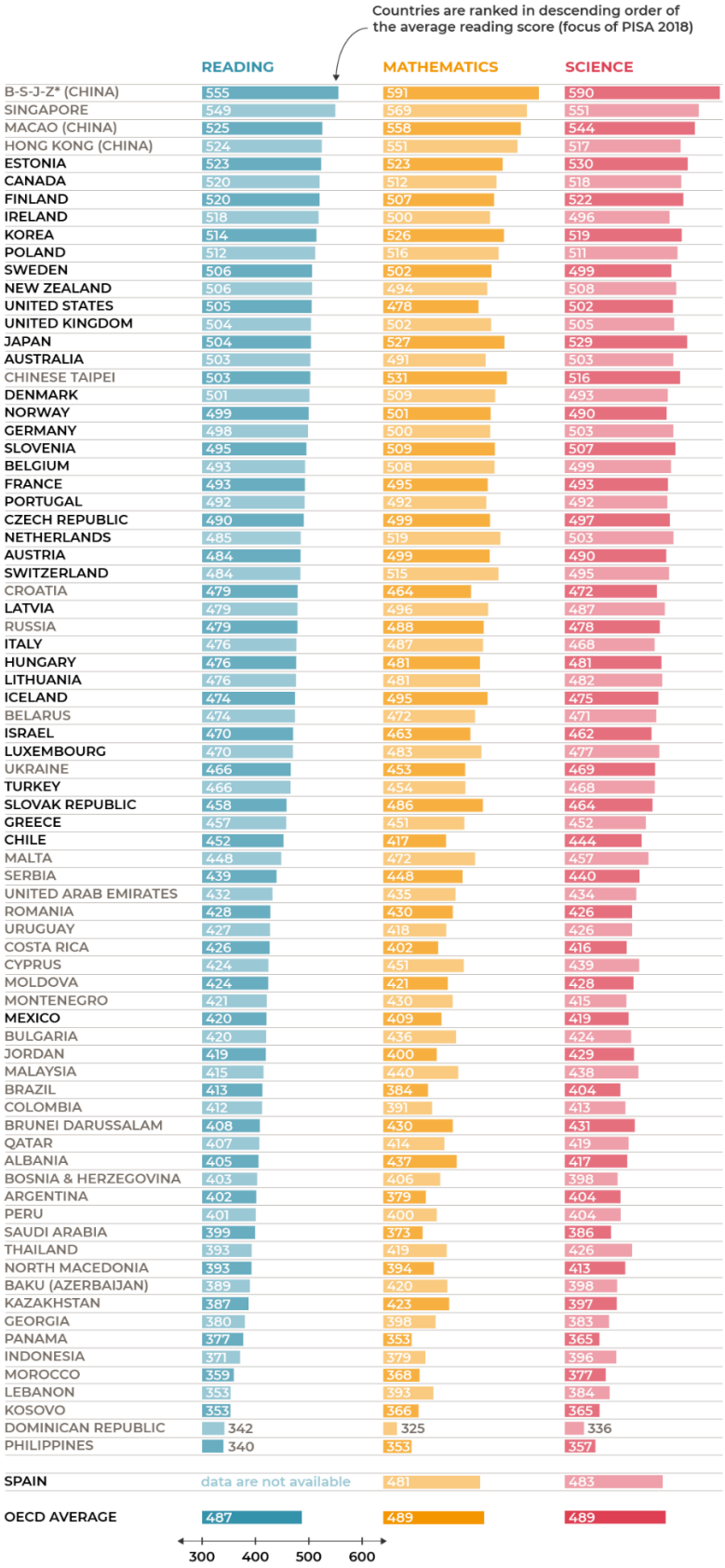
“Svaki drugi učenik u BiH je funkcionalno nepismen. Najlošija postignuća imamo iz prirodnih nauka. Rezultati su za za nekog očekivani, za nekog šokantni, i jasno je da je potrebno poduzeti značajne korake ka poboljšanju obrazovanja. Rješenja u vidu preporuka postoje, i dio su izvještaja. Ono što ohrabruje jeste da učenici u Bosni i Hercegovini općenito imaju pozitivan stav prema obrazovanju. Preko 85% njih vjeruje da će im obrazovanje osigurati bolju budućnost i zaposlenje te da se trud u obrazovanju isplati.", - „kazala je na predstavljanju rezultata Žaneta Džumhur iz Agencije za predškolsko, osnovno i srednje obrazovanje BiH (APOSO), pod čijom je mjerodavnošću i pod pokroviteljstvom Organizacije za ekonomski razvoj i suradnju (OECD) i organizirano PISA istraživanje u BiH.“

Pisa testiranje je obuhvatilo 6.500 učenika u dobi od 15 godina, iz 200 škola širom BiH, odabranih metodom slučajnog uzorka. Petnaestogodišnjaci su radili test u trajanju od dva sata, i koji nije bio u direktnoj vezi s nastavnim planovima i programima u BiH, nego je zasnovan na stečenim kompetencijama petnaestogodišnjaka, te uporediv na međunarodnom planu.

U pregledu ispod imamo rezultate poslijednjeg PISA testiranja u cijelom svijetu iz 2018.godine.

PISA 2018 results

Snapshot of students' performance in reading, mathematics and science



Source: OECD, PISA 2018 Database || *B-S-J-Z refers to Beijing, Shanghai, Jiangsu and Zhejiang

Slika 1. Rezultati PISA testiranja iz 2018. godine

To su zadnji, relevantni podaci. Da li će OECD organizovati PISA testiranje u 2021. godini (pošto se organizuje svake tri godine), zbog pandemije, ostaje da vidimo ?

Generalno, u regionu Zapadnog Balkana, ne samo u BiH, imamo jako niske rezultate kod PISA testova, dok, vidimo u susjednoj Hrvatskoj visoko 29 mjesto, kao i u nekim drugim regionima ti su rezultati na visokom nivou.

Radi poređenja, u nastavku ce slijediti pregled nekih najuspjesnijih obrazovnih sistema u svijetu.

1. Singapur

Ima vrlo jak sistem osnovnog, temeljnog obrazovanja, gdje se jako puno novca ulaže u obrazovanje, tako da učenici postaju vrhunski stručnjaci iz svih oblasti i stvaraju nove vrijednosti u smislu visokog-na trećem mjestu u svijetu-GDP-a (64.600 $) koji se opet u određenom procentu preljeva u obrazovni sistem, te na taj način imaju vrhunski obrazovni sistem i vrhunske rezultate.

2. Južna Koreja

Učenici sedam dana idu u školu, jak GDP, u obrazovni sistem se ulaže 12 milijardi dolara godišnje.

3. Japan

Jako razvijena tehnologija, jak GDP, u obrazovni sistem ulažu mnogo novca. Japan ima jako veliku pismenost stanovništva, a nalazi se na vrhu liste po pismenosti iz oblasti matematike i ekonomije u organizaciji OECD-a- PISA testovi. 98 % osnovnoškolske populacije upisuje srednje škole, mada srednjoškolsko obrazovanje u Japanu nije obavezno.

4. Hong Kong

Vrlo visoka pismenost stanovništva, model obrazovanja sličan modelu Ujedinjenog Kraljevstva

5. Finska

Finska kao manu ima to da prerano uključuje djecu u obrazovni sistem, ali je dugo bila vodeća u svijetu po obrazovanju, međutim, azijske zemlje su je pretekle upravo iz ovog razloga. Školovanje apsolutno besplatno, tako da je i dalje u samom vrhu obrazovnih sistema.

6. Katar i Novi Zeland

Na ovim prostorima zadnjih godina jako je inoviran obrazovni sistem, te su ovi regioni shvatili da koliko god ulože u obrazovanje nije puno, iz razloga jer zahvaljujući kvalitetnom obrazovnom sistemu, prave i osale sisteme kvalitetnim, te tako doprinose da im u osnovi države i regioni budu zasnovani na istinskim vrijednostima i jakim temeljima za budućnost.

7. Kanada

Stanovništvo je 99% pismeno, stopa visokoobrazovanih ljudi najveća na svijetu. Obrazovanje zakonski obavezno do 16 ili 18 godine života (u zavisnosti od provincije). Obrazovanje traje 190 dana u godini, ulažu 6 % ukupnog budžeta u obrazovni sektor.

8. Nizozemska

Bila je dugo na samom vrhu ljestvice, ali su je zadnjih godina loša planiranja i niska ulaganja u srednjoškolski obrazovni sistem, spustili na osmo mjesto ljestvice.

9. Danska

Obrazovanje obavezno do 16 godine, a 82 % srednješkolsko obrazovanih ljudi upisuju fakultete, što doprinosi rastu i razvoju cijele društvene zajednice Danske.

10. Poljska

Poljska ima jak i čvrsto postavljen osnovnoškolski i srednjoškolski obrazovni sistem što ju je i svrstalo na deseto mjesto u svijetu po pitanju obrazovanja.

Ovo su samo neki od primjera iz kojih vidimo da većina jako puno ulaže novca u obrazovne sisteme, te se može steći pogrešan dojam, to su bile samo zanimljivosti, iz naše blkanske perspektive, nedokučive, ali imamo i kontra primjere. Bitno je istaći da su zemlje poput SAD i Norveške, one koje najviše novca ulažu u obrazovanje, mada vidimo da to nije presudno jer se ne nalaze ni u prvih 30 u svijetu. Iz tog razloga vidimo da su obrazovni sistemi, ispravno postavljeni, u skladu sa preporukama, razumjevanju, primjeni u praksi, cjeloživotnim učenjem, ishodima, sistemi koji podliježu aktuelnim promjenama i praćenju novih vrijednosti u skladu sa razvojem nauke i tehnike, te kritičke misli, zaista najbolji obrazovni sistemi u svijetu.

ZAKLJUČAK

Iz gore izloženog možemo da se osvrnemo na vlastiti obrazovni sistem i nađemo određene zamjerke, zbog loših rezultata koje učenici pokazuju prilikom testiranja, ali i ekonomske stagnacije koja je uzročnoposljedična.

Naši obrazovni sistemi, uz mnoštvo zamjerki koje imaju, najčešće se smatraju preglomaznim i tromim, stoga ih je teško učiniti funkcionalnim, te učenici poslije završenog obrazovanja izlaze „neupotrebljivi“ za tržište rada. Birokratski aparat, koji stoji iza obrazovnog sistema, nije fleksibilan. Glavne karakteristike savremenog tržišta, te tako i tržišta obrazovanja jesu dinamičnost, kompleksnost i stalno prilagođavanje, efikasnije učenje i rješavanje situacija i određenih komplikovanih problema za koje su potrebni otvoreni umovi, kritičko mišljenje i brzo prilagođavanje promjenama. Potrebno je da se razvija individualno, a ne kolektivno mišljenje i upotreba naučenog u relnom životu kroz određene vidove prakse ili dualnog obrazovanja. Sam sistem ocjenjivanja i pukog ponavljanja onog što je u udžbenicima, čini samo jedno prihvatanje mnoštva informacija koje su same po sebi, bez primjene, neupotrebljive.

Potrebno je da učitelji potiču kritičko mišljenje kroz razne metode i vještine, a da bi se to postiglo, potrebno je permanentno usavršavanje, učenje, razmjena iskustava u riznici svjetskog znanja, kao i pozitivnih i dobrih praksi.

Važnost kvalitetnih obrazovnih sistema ne može se dovoljno naglasiti, a njih čine kvalitetno obrazovanje, koje pak čine učitelji i učenici u stalnoj simbiozi i želji za napretkom i primjenom naučenog.

Kroz preporuke OECD-a, te PISA testiranja, možemo u svakom momentu znati koji su nedostaci BH, te regionalnih, obrazovnih sistema.

Kroz sve, gore navedeno, radi globalizacije, turbulentnog okruženja, cjeloživotnog učenja, te kritičkog mišljenja, pretpostavlja se da će mlade generacije Zapadnog Balkana i BiH biti građani Europske Unije, te je jako bitna reforma obrazovnog sistema, radi njihove, ali i budućnosti samog regiona. PISA

rezultati pokazuju koliko obrazovni sistemi podržavaju ekonomski i društveni razvoj, te radi nivoa pravičnosti, mladost cijelog Zapadnog Balkana zaslužuje bolji i kvalitetniji obrazovni sistem.

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9. „Rezolucija o promicanju poboljšanja evropske saradnje u obrazovanju i osposobljavanju“ ; Vijeće Europe, 2019

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EDUCATIONAL SYSTEMS

SUMMARY:

Education in Bosnia and Herzegovina, but also in the Western Balkans region, faces major problems and challenges, and a solution is not easy to find. The possibility of "dual education", lifelong learning, development of critical thinking, application of acquired knowledge in real life and environment has been considered for a long time, which would create full integration of all systems and reject unusable knowledge, which young people mostly acquire through existing education systems. The main problems are the cumbersomeness and sluggishness of the existing education systems, which in a turbulent, global environment, hardly or almost not at all recognize change. This change would create an environment of better education, work, living and functioning of the economy as a whole, which is ultimately shown by the results of PISA testing, OECD recommendations, and the world's leading education systems.

Keywords: education systems, lifelong learning, critical thinking, turbulent environment, globalization, OECD, PISA

"Education is expensive, but ignorance is even more expensive"
Claus Moser

INTRODUCTION

Educational systems represent a more complex and broader concept than the school system, because they sublimate the institutional, school system, but also all other forms of non-institutional education, through permanent, continuous and lifelong learning.

The education systems themselves, any geographical region and area, are constantly undergoing a certain type of change, as, after all, are all the systems in which we exist and operate.

Educational systems as we know them, with minor changes, cosmetic character, were created in a different time and space, without mass global interaction, in the time of the industrial period, when the teaching and transfer of knowledge, skills and good practices, and their absorption and reproduction , were in harmony with that time, which, indeed, was much different from today. A lot has changed since then. It is necessary to start thinking on a global level, outside the framework of existing, sluggish, educational systems.

As the period behind us, the period of the COVID-19 Pandemic, and the period of total lock down showed, the whole educational world, through different systems of access and implementation of education, faced a new challenge that, in essence, changed existing perceptions, perceptions and approaches in conducting education. For the first time in this time, globally, we faced the so-called "Online education". Formal classroom and frontal form of work have completely remained a "thing of the past".

What kind of education certain geographical areas and new generations will have through their educational systems will depend on each individual, who will incorporate his work into the education systems and thus create new values.

"Education is our passport to the future, because tomorrow belongs to those who prepare for it today."
Malcom X

EDUCATION SYSTEMS

Those regions, countries, and, therefore, education systems, which manage to recognize that the education system and its constant reform, and constant adaptation to young people from the earliest childhood, through lifelong learning and acquiring skills, will be the most important resource. happy in the future. Knowledge is power. We should not look for ways to improve existing education systems, but, in general, we should change perceptions, and move towards improving education through the creation of a completely new education system.

Although this seems difficult to achieve, the concept is, right there, in our hands. A reminder in the form of a pandemic, which greatly changed the traditional understanding of education and created a breakthrough in the application of new ideas in the education system itself, changing it from the roots, and creating a new environment, implementing new ideas, through a mass collectivity education systems. There was a collective cooperation of teachers, exchange of experiences, application of good practices, flexibility in terms of improving the education system through experimental teaching, dynamic teaching, which does not stagnate, which is constantly changing.

It is not necessary to "destroy" the existing education systems, but to continue with the collective awareness of the collective education system, which is changing and improving every day, through the global exchange of acceptable educational practices. One of the basic driving forces in educational systems is the

synthesis of global accumulated experience and its daily exchange. Knowledge is the only thing in the world that is multiplied by sharing.

Through the application of new technologies and methodologies, educational systems are being improved, refined and improved on a daily basis. Experiences of educational systems of different regions contribute to a huge amount of knowledge and skills, which we transfer in a specific way to the young population, which in addition to theoretical knowledge needs skills and methodology of applying this knowledge in practice and real life, and ways to make their school days better. each segment, creating future generations of professional people oriented towards lifelong learning, and the very way and methodology of "know-how".

OECD AND PISA TESTING

The OECD, a socially responsible organization, an organization for economic cooperation, founded in 1960, as the successor of the organization for European economic cooperation within the Marshall Plan, is a consultative, non-binding organization, whose opinion they hold and whose guidelines are followed by all developed countries In 2000, PISA (International Student Assessment Program) conducted research and testing, in order to clearly and accurately review how, within different education systems, students fully understand what they are learning and what should be the goal and outcome of each education system. The focus is on how students "draw", understand and remember the content and draw conclusions, and sublimate knowledge. The emphasis is primarily on understanding the content, and the way to reach the outcome, which will serve as a conclusion and recommendation to different education systems, in order to change and improve certain segments and elements of the existing education system.

PISA tests are conducted every three years, since 2000, in over seventy countries around the world, in a way that high school students, fifteen-year-olds, are tested in the areas of text comprehension, mathematics and science, and since 2015 and team problem solving.

Regarding Bosnia and Herzegovina and the tests conducted in 2018 in the above-mentioned areas, and organized by the OECD, BiH students have joined a group of more than half a million tested students from 79 countries around the world.

The overall results, for all participating countries, were published in Sarajevo on December 3, 2019, and BiH ranked 62nd out of 79 participating countries. It was stated that students in BiH from all areas of testing are, on average, three years behind the schooling of their peers in countries that have advanced education systems.

The statements that we could read in the media in those days, but also the official statements, were:

"The results are expected for some, shocking for some, and it is clear that significant steps need to be taken to improve education."

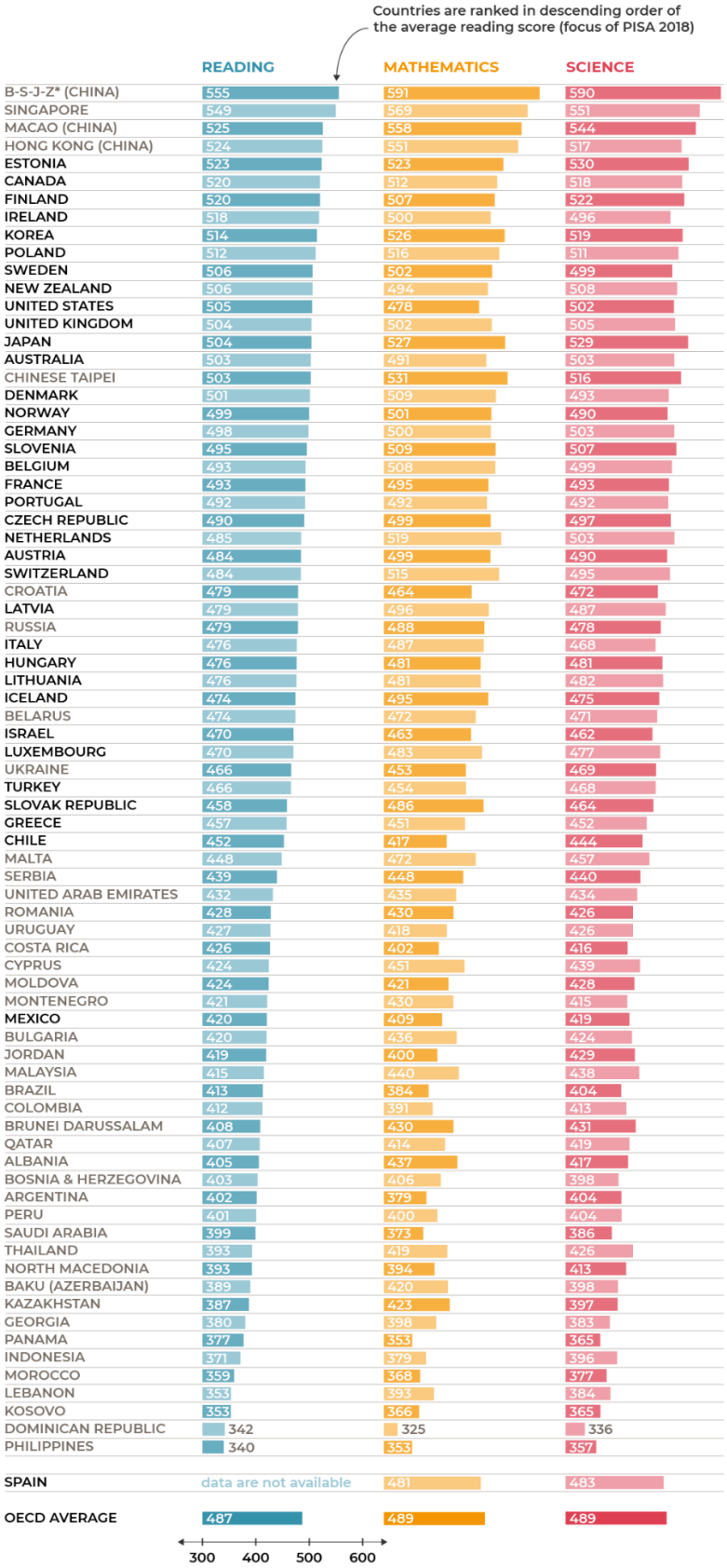
"Every other student in BiH is functionally illiterate. We have the worst achievements in the natural sciences. The results are expected for some, shocking for some, and it is clear that significant steps need to be taken to improve education. Solutions in the form of recommendations exist, and are part of the report. What is encouraging is that students in Bosnia and Herzegovina generally have a positive attitude towards education. Over 85% of them believe that education will provide them with a better future and employment, and that the effort in education will pay off. ", - said at the presentation of the results Janet Džumhur from the Agency for Preschool, Primary and Secondary Education of BiH (APOSO) under the auspices and under the auspices of the Organization for Economic Development and Cooperation (OECD) and organized PISA survey in BiH. "

Pisa testing included 6,500 15-year-old students from 200 schools across BiH, selected by random sampling. Fifteen-year-olds took a two-hour test, which was not directly related to the curricula in BiH, but was based on the acquired competencies of fifteen-year-olds, and comparable internationally.

In the overview below, we have the results of the latest PISA test worldwide from 2018.

PISA 2018 results

Snapshot of students' performance in reading, mathematics and science



Source: OECD, PISA 2018 Database || *B-S-J-Z refers to Beijing, Shanghai, Jiangsu and Zhejiang

Figure 1. Results of the 2018 PISA test

These are the latest, relevant data. Will the OECD organize PISA testing in 2021 (since it is organized every three years), due to the pandemic, it remains to be seen?

In general, in the region of the Western Balkans, not only in BiH, we have very low results in PISA tests, while in neighboring Croatia we see a high 29th place, as in some other regions, these results are at a high level.

For comparison, the following is an overview of some of the most successful education systems in the world.

1. Singapore

It has a very strong system of basic, basic education, where a lot of money is invested in education, so that students become top experts in all fields and create new values in terms of high-third in the world-GDP ($ 64,600) which is again in a certain percentage overflows into the education system, and thus have a top education system and top results.

2. South Korea

Students go to school for seven days, strong GDP, 12 billion dollars a year are invested in the education system.

3. Japan

Highly developed technology, strong GDP, they invest a lot of money in the education system. Japan has a very high literacy rate, and is at the top of the list in terms of literacy in mathematics and economics organized by the OECD - PISA tests. 98% of the primary school population enrolls in secondary schools, although secondary education in Japan is not compulsory.

4. Hong Kong

Very high literacy of the population, a model of education similar to the model of the United Kingdom.

5. Finland

Finland has the disadvantage of including children in the education system too early, but it has long been a world leader in education, however, Asian countries have overtaken it for this very reason. Education is absolutely free, so it is still at the very top of education systems.

6. Qatar and New Zealand

In recent years, the education system has been heavily innovated in these areas, and these regions have realized that no matter how much they invest in education, not much, because thanks to a quality education system, they make quality systems, and thus contribute to the state and regions. based on true values and strong foundations for the future.

7. Canada

The population is 99% literate, the rate of highly educated people being the highest in the world. Education is legally compulsory until the age of 16 or 18 (depending on the province). Education lasts 190 days a year, investing 6% of the total budget in the education sector.

8. Netherlands

It has long been at the very top of the rankings, but in recent years poor planning and low investment in the secondary education system have dropped it to eighth place in the rankings.

9. Denmark

Education is compulsory until the age of 16, and 82% of high school educated people enroll in colleges, which contributes to the growth and development of the entire Danish community.

10. Poland

Poland has a strong and firmly established primary and secondary education system, which ranks it tenth in the world in terms of education.

These are just some of the examples from which we see that most people invest a lot of money in education systems, and one can get the wrong impression, they were just interesting, from our Balkan perspective, incomprehensible, but we also have counter examples. It is important to point out that countries like the USA and Norway are the ones that invest the most money in education, although we see that this is not crucial because they are not even in the top 30 in the world. For this reason, we see that educational systems, properly set up, in accordance with recommendations, understanding, application in practice, lifelong learning, outcomes, systems subject to current changes and monitoring of new values in accordance with the development of science and technology, and critical thinking, indeed the best education systems in the world.

CONCLUSION

From the above, we can look at our own education system and find certain objections, due to the poor results that students show when testing, but also the economic stagnation that is causal.
Our education systems, in addition to the many objections they have, are often considered too cumbersome and sluggish, so it is difficult to make them functional, and students after graduation go "unusable" for the labor market. The bureaucratic apparatus behind the education system is not flexible. The main characteristics of the modern market, and thus the education market, are dynamism, complexity and constant adjustment, more efficient learning and solving situations and certain complicated problems that require open minds, critical thinking and quick adaptation to changes. It is necessary to develop individual, not collective thinking and use of what is learned in real life through certain types of practice or dual education. The very system of grading and merely repeating what is in the textbooks, makes only one acceptance of a multitude of information which are in themselves, without application, unusable.

It is necessary for teachers to encourage critical thinking through various methods and skills, and in order to achieve this, it is necessary to constantly improve, learn, exchange experiences in the treasury of world knowledge, as well as positive and good practices.

The importance of quality education systems cannot be sufficiently emphasized, and they are made up of quality education, which in turn consists of teachers and students in constant symbiosis and the desire to progress and apply what has been learned.

Through the OECD recommendations and PISA testing, we can know at any time what are the shortcomings of BH and regional education systems.

Through all the above, for the sake of globalization, turbulent environment, lifelong learning, and critical thinking, it is assumed that the young generations of the Western Balkans and BiH will be citizens of the European Union, and the reform of the education system is very important for their future. . PISA results show how much education systems support economic and social development, and for the sake of fairness, the youth of the entire Western Balkans deserves a better and better education system.

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Šolski center Celje
Srednja šola za storitvene dejavnosti in logistiko

Vpliv epidemije na stanje prometne varnosti v Republiki Sloveniji

Avtor prispevka: Matic Turnšek

Maj, 2021.

POVZETEK

Vsako leto se v Sloveniji vodi statistika prometnih nesreč. To statistiko vodi javna Agencija za varnost prometa v sodelovanju z drugimi inštitucijami. V letu 2020 smo imeli dva obdobja razglašene epidemije. Za namen zajezitve epidemije so bili uvedeni ukrepi o omejitvi gibanja. Takšna omejitev neposredno vpliva na prometne tokove, gostoto prometa, vrsto udeležencev v prometu in tudi na namene za vožnjo. V sled temu je javna agencija predstavila izsledke prometne varnosti v Sloveniji v času epidemije in jih primerjala z enakim obdobjem v letu pred tem. Podatki so spodbudni, saj se je prometna varnost izboljšala na vseh področjih, vzroki za izboljšanje pa so različni. Poglaviten vzrok za izboljšanje prometne varnosti je še vedno manjše število udeležencev v prometu. V drugem valu epidemije se pa glede na števna mesta prometa, gostota prometa ni bistveno razlikovala od leta 2019. Kljub temu smo v Sloveniji beležili izboljšanje prometne varnosti, v mesecu decembru pa celo 0 smrtnih žrtev v prometnih nesrečah. Razlogi za izboljšanje prometne varnosti so najverjetneje v drugih prilagoditvah, ki jih bom skušal opredeliti v tem prispevku. Javna agencija za varnost prometa v Sloveniji si bo še naprej prizadevala k izboljšanju prometne varnosti in se zaveda, da bo ob sproščanju ukrepov za omejitev epidemije, prišlo do ponovnega poslabšanja prometne varnosti. V ta namen se bo aktivno vključevala v ozaveščanje udeležencev cestnega prometa o pomembnosti varne vožnje, s tem pa pripomogla k omilitvi morebitnega poslabšanja prometne varnosti v prihajajočem letu.

1.UVOD

Prometni varnosti v Sloveniji posvečamo veliko pozornosti. Poleg policije imamo v Sloveniji veliko združenj, ki ozaveščajo voznike v cestnem prometu. Naša največja agencija za varnost prometa (AVP) je bila ustanovljena za točno takšen namen, saj je potrebno voznike ozaveščati o novostih, jih spodbujati k varnejši vožnji, jim nuditi izobraževalne tečaje, organizirati srečanja in raznorazne predstavitve vezane na promet in prometno varnost. AVP sodeluje z vsemi institucijami v Sloveniji, tudi s policijo, s katero vsako leto pripravljajo veliko preventivnih akcij za voznike. Vsako leto agencija spremlja prometno varnost in število prometnih nesreč. Podatke analizira in se na podlagi zbranih informacij aktivno vključuje v reševanje slabih in promoviranje dobrih metod za povečanje prometne varnosti v Sloveniji. V tem prispevku bom predstavil, kako se je spreminjala prometna varnost v času epidemije covida-19, s primerjavo števila prometnih nesreč med posameznimi obdobji. Poleg splošnega zmanjšanja števila udeležencev v cestnem prometu, se je pa izboljšala tudi prometna varnost.

2.ANALIZA PROMETNIH NESREČ V LETU 2020

LETO	Št. prometnih nesreč	Št. prometnih nesreč s telesno poškodbo in smrtjo	Posledice (poškodbe)			Skupaj poškodbe (H+L)
			Smrt	Huda tel. poškodba	Lažja tel. poškodba	
2016	17.931	6495	130	850	7606	8456
2017	17.584	6185	104	851	7050	7901
2018	18.248	6014	91	821	6867	7688
2019	18.861	6025	102	814	6756	7570
2020	14.923	4749	80	675	5008	5683
primerjava 20/16	**-17 %**	**-27 %**	**-38 %**	**-21 %**	**-34 %**	**-33 %**
primerjava 20/19	**-21 %**	**-21 %**	**-22 %**	**-17 %**	**-26 %**	**-25 %**

Zgornja tabela prikazuje orientacijsko primerjavo podatkov o prometnih nesrečah in posledicah za obdobje zadnjih petih let, od 2016 pa do 2020.

Policisti so na slovenskih cestah v letu 2020 obravnavali 14.923 evidentiranih prometnih nesreč oz. 21 % manj kot v letu 2019. V omenjenem obdobju se je število prometnih nesreč s telesnimi poškodbami in smrtjo zmanjšalo za 21 %.

Skupaj je v letu 2020 na slovenskih cestah umrlo 80 udeležencev cestnega prometa oz. 22 manj kot v lanskem primerjalnem obdobju (zmanjšanje za 22 %). Število umrlih in poškodovanih je bilo tako v letu 2020 najnižje, odkar se beleži uradno statistiko prometnih nesreč (od leta 1954 dalje). Manjše število umrlih je posledica predvsem boljšega stanja v mesecih januar, april, julij, oktober, november ter december, ko je umrlo 37 udeležencev v prometu manj kot leto poprej. Mesec december 2020 je bil prvi zabeležen mesec doslej, ko v prometnih nesrečah ni umrl nihče.

Število hudo telesno poškodovanih je za 17 % manjše kot v letu 2019 – do konca leta 2020 se je hudo telesno poškodovalo 675 (814 v 2019) udeležencev. Pri lažje telesno poškodovanih prav tako beležimo zmanjšanje števila poškodovanih in sicer za 26 % – skupaj se je lažje telesno poškodovalo 5.008 (6.756 v letu 2019) udeležencev. Skupno število poškodovanih v letu 2020 je najmanjše v zadnjih 5 letih.

Največ prometnih nesreč glede na starostno skupino so povzročili udeleženci v starosti med 25-34 leti (2.319) ter 35-44 leti (2.312). V letu 2019 sta prav tako prednjačili ti dve starostni skupini, med 25-34 leti so bili povzročitelji 3.009 prometnih nesreč; med 35-44 leti pa so povzročili 2.972 prometnih nesreč.

Povprečna starost povzročiteljev smrtnih prometnih nesreč v letu 2020 znaša 42,8 let in se je glede na leto poprej znižala za pet let, iz 47,8 let.

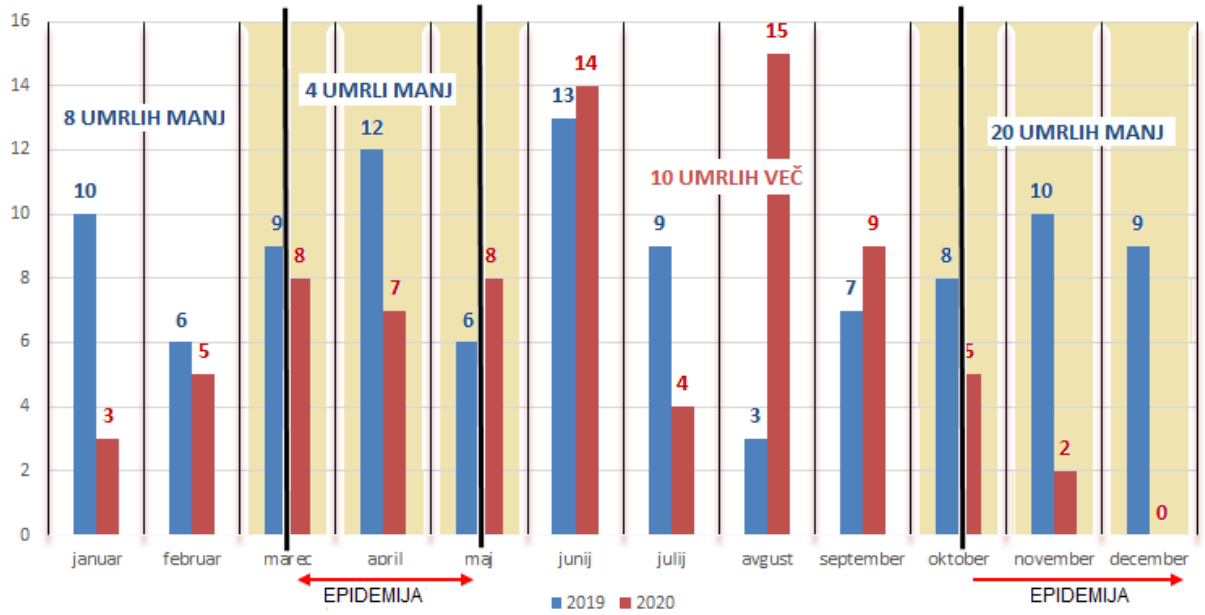
3.STATISTIKA PROMETNIH NESREČ V ČASU EPIDEMIJE COVID-19

Leto 2020 je zaznamovala epidemija nalezljive bolezni COVID-19, posledica le-tega je vidna tudi na področju cestnega prometa. Zaradi vrste ukrepov za zajezitev epidemije se je v letu 2020 promet na slovenskih cestah v primerjavi z letom 2019 občutno zmanjšal, kar je predvsem razvidno v mesecu aprilu 2020 na državnih cestah. Po neuradnih podatkih iz avtomatskih števnih mest (667 števnih mest) se je promet na državnih cestah zmanjševal od meseca marca dalje. Promet se je najbolj zmanjšal ravno v času razglašene prve epidemije COVID-19 v spomladanskih mesecih (12. marec – 14. maj 2020) nekaj manj pa v času drugega dela epidemije (19. oktober 2020 dalje). V letu 2020 se je promet na državnih cestah povprečno mesečno zmanjšal za 18 % (ocena po neuradnih podatkih).

Podatki o številu prometnih nesreč za leti 2019 in 2020 na avtocestah in hitrih cestah so prikazani v spodnji tabeli:

MESEC	**Število prometnih nesreč na AC in HC**		**Sprememba 2019/2020**
	2019	**2020**	
januar	148	127	-14%
februar	123	112	-9%
marec	148	92	-38%
april	154	41	**-73%**
maj	196	84	**-57%**
junij	236	140	-41%
julij	221	180	-19%
avgust	199	155	-22%
september	225	136	-40%
oktober	182	155	-15%
november	176	85	**-52%**
december	177	155	**-12%**

Tudi primerjava števila umrlih udeležencev v cestnem prometu med letoma 2020 in 2019 kaže največje pozitivne razlike ravno v mesecih, ko je bila razglašena epidemija, najbolj negativne pa v mesecih, ko epidemija ni bila razglašena.



Zgornja slika prikazuje število umrlih po posameznih obdobjih. Izpostavljeno je obdobje pred epidemijo, obdobje 1. dela epidemije, poletni meseci ter obdobje 2. dela epidemije. V obdobju marec – maj in v obdobju oktober – december je v letu 2020 v primerjavi z letom 2019 umrlo 24 udeležencev manj. Drugi val epidemije kaže še na bolj konkretno zmanjšanje števila umrlih, ob tem pa je bil po zgoraj navedenih podatkih števnih mest skupen obseg prometa sicer že večji, kot v prvem valu.

Število umrlih v prometnih nesrečah v času prve in druge epidemije primerjalno z letom poprej prikazuje spodnja tabela:

OBDOBJE	Št. umrlih
15.3.2019 - 15.5.2019	17
15.3.2020 - 15.5.2020	12
primerjava 20/19	**-29%**
OBDOBJE	Št. umrlih
19.10.2019 - 31.12.2019	17
19.10.2020 - 31.12.2020	4
primerjava 20/19	**-76%**

Za primerjavo, kakšno je bilo stanje prometne varnosti na ravni Evropske unije spomladi 2020, s poudarkom na vplivih, ki so jih imeli za to področje ukrepi za zajezitev epidemije, se lahko opremo na Poročilo Evropskega sveta za varnost v prometu (ETSC) iz julija 2020. Poročilo izpostavlja, da so potrebne nadaljnje raziskave, da bi ugotovili, zakaj se število smrtnih žrtev na cestah po Evropi ni zmanjšalo enako kot obseg prometa.

Poročilo obenem razkriva, da je bil na ravni EU aprila 2020 povprečno zabeležen 36-odstotni padec smrtnih žrtev na cestah v primerjavi s povprečjem 2017–19. Aprila 2020 je v Sloveniji umrlo 7 udeležencev v

prometu oziroma 40 % manj kot v 2019 (5 manj kot aprila 2019, 2 manj kot aprila 2018 in 7 manj kot aprila 2017). Po neuradnih podatkih iz avtomatskih števnih mest (667 števnih mest) se je v Sloveniji v aprilu 2020 obseg prometa zmanjšal najbolj drastično in sicer za 53,51 % (17 % več kot je bilo povprečje EU).

Največje zmanjšanje števila smrtnih žrtev na cestah so zabeležili v **Italiji** (-84 %)-ni podatka o zmanjšanju obsega prometa, sledijo **Belgija** (-68 %) ob 60-odstotnemu zmanjšanju obsega prometa, **Španija** (-63 %) ob 75-odstotnemu zmanjšanju obsega prometa, **Francija** (-61 %)-ni podatka o zmanjšanju obsega prometa in **Grčija** (-59 %)-ni podatka o zmanjšanju obsega prometa. Statistični podatki **Irske** kažejo, da se je v tednu od 27. marca do konca aprila obseg prometa zmanjšal za 65–70 %. Število smrtnih žrtev na cestah se je v primerjavi s prejšnjimi tremi leti zmanjšalo za 36 %.

Toda zmanjšanje obsega prometa ni povzročilo zmanjšanja števila smrtnih primerov v vseh državah. Na **Švedskem** (+2 %), **Danskem** (+ 6%), **Nizozemskem** (+13 %) in **Slovaškem** (+20 %) je število smrtnih žrtev na cestah celo višje kot v prejšnjih letih. Na **Češkem** se je število smrtnih žrtev v aprilu povečalo za +5 % kljub zmanjšanemu obsegu prometa za 65 % v naseljih in za 70 % na avtocestah.

V sosednih državah je bilo stanje sledeče: v **Avstriji** se je število smrtnih žrtev zmanjšalo za -9 %, v **Italiji** za kar -84 %, na **Hrvaškem** za -35 % ob sočasnem 50-odstotnem zmanjšanju obsega prometa, na **Madžarskem** pa za 49 % ob 41-odstotnem zmanjšanju obsega prometa.

Poročilo ETSC kot možne vzroke izpostavlja **vožnjo z neprilagojeno hitrostjo** in **večje število ranljivih udeležencev v cestnem prometu**. Podatki iz 10 držav iz časa prvega vala epidemije nakazujejo, da bi bila vožnja z neprilagojeno hitrostjo lahko pomemben dejavnik povečanih tveganj za nastanek prometne nesreče, ki praviloma prinaša težje posledice in smrt.

Danska je objavila uradne podatke, ki kažejo 10-odstotno povečanje deleža voznikov, ki prehitevajo.

Podatki **francoskih** radarjev so pokazali 16-odstotno povečanje najtežjih kršitev prekoračitve hitrosti (50 % nad zakonsko dovoljeno hitrostjo) v primerjavi z enakim obdobjem lani.

Estonija je zabeležila 22-odstotno povečanje deleža voznikov, ki presegajo dovoljeno hitrost na glavnih podeželskih cestah, v primerjavi s povprečjem aprila 2018-2019.

V **Španiji** so se kršitve hitrosti, razvidne iz vzorca fiksnih radarjev, na cestah izven naselja, povečale za 39 % v primerjavi z enakim obdobjem leta 2019.

Britanska zavarovalnica, ki uporablja telematiko za spremljanje mladih zavarovancev, je prijavila 15-odstotno povečanje opozoril o hitrosti, poslanih voznikom, ki presegajo omejitve hitrosti.

Na **Švedskem** niso zabeležili povečanja hitrosti.

Tudi za Slovenijo ni mogoče reči, da bi v času epidemij hitrost predstavljala ključni dejavnik poslabšanja, saj je vzrok »neprilagojena hitrost« za nastanek prometne nesreče v prvi epidemiji upadel za tretjino, smrti za dve tretjini in lažje telesne poškodbe za tretjino. Prav tako je bilo za tretjino manj prekrškov. Povečalo pa se je število hudih telesnih poškodb (23 %). V času druge razglašene epidemije se je kljub za petino večjemu številu ugotovljenih prekrškov delež prometnih nesreč zaradi neprilagojene hitrosti in njihovih posledic prav tako zmanjšal. Še manj je bilo smrtnih prometnih nesreč. Če podrobneje analiziramo vzroke nastanka smrtnih prometnih nesreč in kategorijo, pa podatki nakazujejo, da je bilo več umrlih med bolj ranljivimi skupinami, nepravilna stran/smer pa je bila ključna v kar polovici od 12 smrtnih prometnih nesreč. V času druge

epidemije so bili med smrtnimi žrtvami izključno ranljivi udeleženci, pri 2 od 4 smrtnih prometnih nesreč pa je bil vzrok neprilagojena hitrost.

Spodnji tabeli prikazujeta število prometnih nesreč **zaradi vzroka neprilagojena hitrost** v času obeh epidemij in v primerjavi z enakim obdobjem 2019 ter njihove posledice.

Epidemija pomlad 2020

OBDOBJE	Št. prometnih nesreč - **vzrok neprilagojena hitrost**	Posledice (poškodbe)			Prekrški
		Umrli	Huda tel. poškodba	Lažja tel. poškodba	
15.3.2019 - 15.5.2019	502	9	39	282	20.460
15.3.2020 - 15.5.2020*	348	3	48	173	13.657
primerjava 20/19	**-31%**	**-67%**	**23%**	**-39%**	**-33%**

Epidemija jesen-zima 2020

OBDOBJE	Št. prometnih nesreč - **vzrok neprilagojena hitrost**	Posledice (poškodbe)			Prekrški
		Umrli	Huda tel. poškodba	Lažja tel. poškodba	
19.10.2019 - 31.12.2019	704	13	58	333	18.106
19.10.2020 - 31.12.2020*	493	2	19	176	21.680
primerjava 20/19	**-30%**	**-85%**	**-67%**	**-47%**	**20%**

Epidemija pomlad 2020 – **kategorije 12 umrlih udeležencev**: 3 vozniki osebnih vozil, 2 kolesarja, 4 vozniki motornih koles, 2 mopedista, 1 potnik v osebnem vozilu.

Glede na vzrok prometne nesreče pa so 3 umrli zaradi neprilagojene hitrosti (1 voznik motornega kolesa, 1 mopedist, 1 osebno vozilo), 1 zaradi neupoštevanja pravila o prednosti (voznik motornega kolesa), 1 kolesar zaradi premika z osebnim vozilom, 1 voznik osebnega vozila zaradi nepravilnega prehitevanja, ostalih 6 pa zaradi nepravilne strani/smeri vožnje.

V času epidemije jesen-zima 2020 je izmed 4 smrtnih žrtev podrobnejša slika glede na vzrok prometne nesreče in kategorijo udeleženca stanje naslednje: 2 sta umrla zaradi neprilagojene hitrosti (1 voznik motornega kolesa, 1 potnik na motornem kolesu), 1 premik z vozilom – 1 umrli pešec, 1 nepravilna stran/smer vožnje (mopedist).

Alkoholizirani povzročitelji v času obeh epidemij in posledice

Vpliv ukrepov za zajezitev epidemije v 2. delu epidemije je ob okrepljenem nadzoru policije in ob vseh aktivnostih, ki jih je bilo mogoče izvajati (akcije: Slovenija piha 0.0, »Varujmo življenja, vozimo trezni«, znane Slovenke in Slovenci s preventivnimi sporočili) viden tudi na področju alkoholiziranih povzročiteljev. Do konca septembra 2020 je bilo prometnih nesreč, ki so jih povzročili alkoholizirani povzročitelji 3 % manj kot v letu 2019. Ob koncu leta je bilo takšnih prometnih nesreč 13 % manj. Tudi število umrlih zaradi alkoholiziranega povzročitelja se je zmanjšalo iz -11 % ob koncu septembra na -21 % ob koncu leta. Spodnji tabeli prikazujeta število prometnih nesreč zaradi alkoholiziranega povzročitelja v času obeh epidemij in v primerjavi z enakim obdobjem 2019 ter njihove posledice.

Epidemija pomlad 2020

OBDOBJE	Št. PN - povzročitelj pod vplivom alkohola	Posledice (poškodbe)		
		Umrli	Huda tel. poškodba	Lažja tel. poškodba
15.3.2019 - 15.5.2019	235	8	20	100
15.3.2020 - 15.5.2020*	201	6	26	70
primerjava 20/19	**-14%**	**-25%**	**30%**	**-30%**

Epidemija jesen-zima 2020

OBDOBJE	Št. PN - povzročitelj pod vplivom alkohola	Posledice (poškodbe)		
		Umrli	Huda tel. poškodba	Lažja tel. poškodba
19.10.2019 - 31.12.2019	350	5	27	135
19.10.2020 - 31.12.2020*	206	1	11	54
primerjava 20/19	**-41%**	**-80%**	**-59%**	**-60%**

4.ANALIZA PRIMERJALNIH STATISTIČNIH PODATKOV

Pri pregledu statističnih podatkov za primerjalni obdobji 2019 in 2020, lahko ugotovimo, da se je prometna varnost izboljšala. Največji vpliv izboljšanja prometne varnosti je zaslediti zaradi omejitve gibanja pri ukrepih za zajezitev epidemije, saj z zmanjšanjem števila prometnih udeležencev, se posledično zmanjša tudi število možnih nevarnih situacij. Zanimiva primerjava je primerjava števila prometnih nesreč in umrlih udeležencev v obdobju drugega vala epidemije v mesecih oktober do december. V tem času se je kljub manjšemu zmanjšanju števila prometnih udeležencev, število mrtvih v prometnih nesrečah zmanjšalo in

mesec december je bil prvi mesec brez smrtnih žrtev v Sloveniji. Na boljši rezultat prometne varnosti je najverjetneje vplivala dolgo trajajoča policijska ura. Zmanjšalo se je tudi število nedeljskih voznikov, v določeni meri so se zmanjšale tudi vsakodnevne migracije v službo in nazaj. Veliko je še drugih postranskih dejavnikov, ki tudi vplivajo na nastanke prometnih nesreč, ki pa jih v statistiki ne opredeljujemo in jih je nemogoče spremljati. Še vedno je največ prometnih nesreč zaradi neprilagojene hitrosti in alkoholiziranih voznikov, je pa v obeh analizah zaznati velik upad števila smrtnih žrtev predvsem v času drugega vala epidemije.

5.ZAKLJUČEK

Prometna varnost v Sloveniji se je močno izboljšala glede na primerjalno obdobje z letom 2019. Vzroki za izboljšanje prometne varnosti in števila prometnih nesreč, ter umrlih udeležencev so navedeni v prejšnjih odstavkih. Drugi val epidemije je v mesecu decembru prinesel največje izboljšanje prometne varnosti in posledično na naših cestah ni bilo nobene smrtne žrtve, kljub primerljivi gostoti prometa z obdobjem v letu 2019.

V letu 2021 se posledice zmanjšanja prometa v nočnem času, zaradi policijske ure med epidemijo, kažejo v povečanem številu prometnih nesreč z udeležbo divjadi. Do 22. 4. 2021 se je zgodilo že 243 prometnih nesreč s povoženjem živali. Razlog za to je prilagoditev živali na manjšo gostoto prometa med epidemijo in v času policijske ure.

Poleg prometnih nesreč z divjadjo pa v začetku leta 2021 beležimo velik problem pri uporabi varnostnega pasu udeležencev. V prvih štirih mesecih je bilo evidentirano kar 15.000 kršitev zaradi neuporabe varnostnega pasu med vozniki in potniki. Kar 2.000 kršitev je bilo ugotovljenih zaradi neuporabe zadrževalnih sistemov za otroke v vozilih. V prejšnjih letih smo v Sloveniji beležili že kar 94 % pripetost voznikov. To poslabšanje pripisujemo predvsem sprostitvi ukrepov, zmanjšanju pozornosti ob sprostitvah in pomanjkanju vsakodnevne rutine vožnje udeležencev v času epidemije. Še vedno pa predstavljajo velik problem »vikend vozniki«. Takrat so vozniki manj zbrani, razlogi za vožnjo so drugačni kot med tednom, velikokrat je prisoten tudi alkohol.

Splošna prometna varnost pa je vedno najbolj odvisna od nas samih, torej udeležencev v prometu. Vedno moramo skrbeti za to, da bomo vozili v skladu s prometnimi predpisi, da bomo upoštevali varnostne ukrepe, da ne bomo vozili pod vplivom alkohola in da bomo med vožnjo vedno zbrani. Tako bomo sami največ prispevali k zmanjšanju prometnih nesreč in posledično tudi smrtnih žrtev na naših cestah.

6.VIRI

Agencija za varnost prometa v Republiki Sloveniji – statistika prometne varnosti v letu 2020, dosegljiva na strani: https://www.avp-rs.si/stanje-prometne-varnosti-2020-za-petino-manj-mrtvih-in-poskodovanih-za-petino-manj-prometnih-nesrec/ (2. 3. 2021)

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The impact of the epidemic on the state of traffic safety in the Republic of Slovenia

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May, 2021.

ABSTRACT

Traffic accident statistics are kept in Slovenia every year. These statistics are kept by the Public Traffic Safety Agency in cooperation with other institutions. In 2020, we had two periods of declared epidemic. For the purpose of curbing the epidemic, measures to restrict movement were introduced. Such a restriction directly affects traffic flows, traffic density, the type of road users and the driving intentions. Following this, the public agency presented the results of traffic safety in Slovenia during the epidemic and compared them with the same period in the previous year. The data are encouraging, as road safety has improved in all areas and the reasons for the improvement are various. The main reason for improving traffic safety is still the smaller number of road users. In the second wave of the epidemic, the traffic density did not differ significantly from 2019. Regardless of the number of traffic places, in Slovenia we recorded an improvement in traffic safety, and in December even 0 deaths in traffic accidents. The reasons for improving road safety are most likely in the other adaptations I will try to identify in this paper. The Public Agency for Traffic Safety in Slovenia will continue its efforts to improve traffic safety and is aware that with the release of measures to limit the epidemic, there will be a further deterioration of traffic safety. To this end, it will be actively involved in raising the awareness of road users about the importance of safe driving, thus helping to mitigate any deterioration in road safety in the coming year.

1.INTRODUCTION

We pay a lot of attention to traffic safety in Slovenia. In addition to the police, we have many associations in Slovenia that make drivers aware of road traffic. Our largest traffic safety agency (AVP) was set up for just such a purpose, as it is necessary to make drivers aware of innovations, encourage them to drive safer, offer them training courses, organize meetings and various presentations related to traffic and traffic safety. AVP cooperates with all institutions in Slovenia, including the police, with whom they prepare many preventive actions for drivers every year. Every year, the agency monitors traffic safety and the number of traffic accidents. It analyses the data and, based on the collected information, is actively involved in solving bad and promoting good methods for increasing traffic safety in Slovenia. In this paper, I will present how traffic safety changed during the covida-19 epidemic, by comparing the number of traffic accidents between different periods. In addition to the general reduction in the number of road users, road safety has also improved.

2.ANALYSIS OF TRAFFIC ACCIDENTS IN 2020

YEAR	Nr. Traffic accidents	Nr. traffic accidents with bodily injury and death	Consequences (injuries)			Total injuries
			Death	Severe bodily injury	minor bodily injury	
2016	17.931	6495	130	850	7606	8456
2017	17.584	6185	104	851	7050	7901
2018	18.248	6014	91	821	6867	7688
2019	18.861	6025	102	814	6756	7570
2020	14.923	4749	80	675	5008	5683
comparison 20/16	**-17 %**	**-27 %**	**-38 %**	**-21 %**	**-34 %**	**-33 %**
comparison 20/19	**-21 %**	**-21 %**	**-22 %**	**-17 %**	**-26 %**	**-25 %**

The table above shows an indicative comparison of data on road accidents and consequences for the last five years, from 2016 to 2020.

In 2020, police officers dealt with 14,923 registered traffic accidents on Slovenian roads. 21% less than in 2019. In the mentioned period, the number of traffic accidents with injuries and deaths decreased by 21%.

In 2020, a total of 80 road users died on Slovenian roads. 22 less than in the comparable period last year (a decrease of 22%). The number of deaths and injuries was thus the lowest in 2020 since the official statistics of traffic accidents were recorded (since 1954). The lower number of deaths is mainly due to the better situation in January, April, July, October, November, and December, when 37 road users died less than the year before. December 2020 was the first recorded month so far when no one died in a car accident.

The number of severely injured is 17% lower than in 2019 - by the end of 2020, 675 (814 in 2019) participants were seriously injured. In the case of minor injuries, we also recorded a decrease in the number of injured by 26% - a total of 5,008 (6,756 in 2019) participants suffered minor injuries. The total number of injuries in 2020 is the lowest in the last 5 years.

The highest number of traffic accidents by age group was caused by participants aged 25-34 years (2,319) and 35-44 years (2,312). In 2019, these two age groups also led the way, between the ages of 25-34 they were the perpetrators of 3,009 traffic accidents; between 35-44 years, they caused 2,972 traffic accidents.

The average age of the perpetrators of fatal traffic accidents in 2020 is 42.8 years and has decreased by five years compared to the previous year, from 47.8 years.

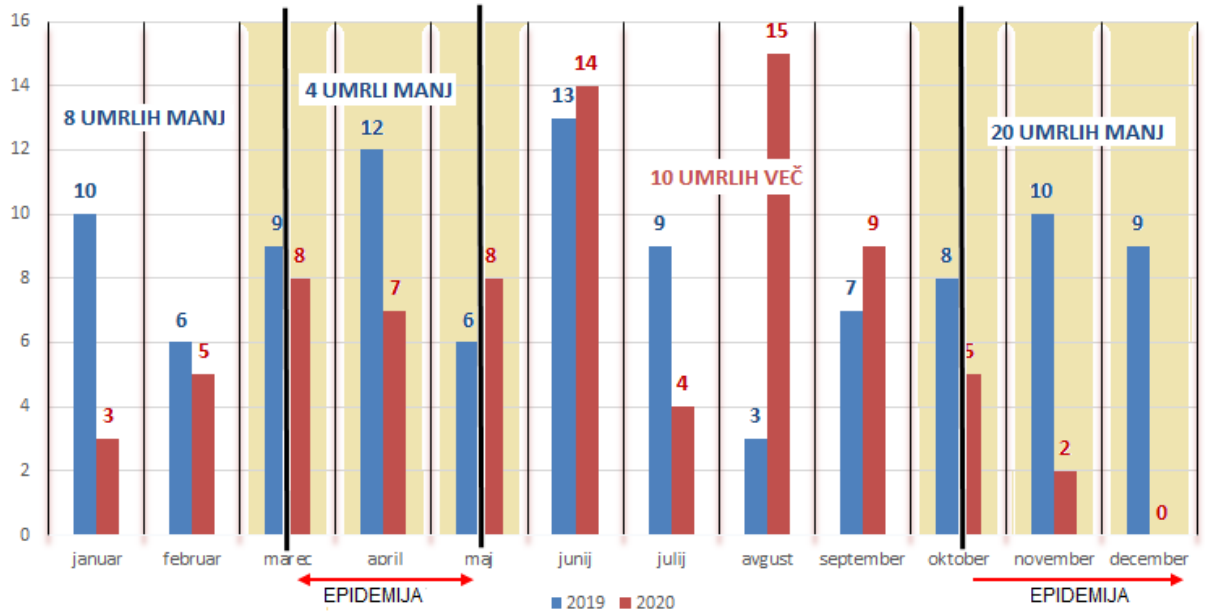
3.TRAFFIC ACCIDENT STATISTICS DURING THE COVID-19 EPIDEMIC

The year 2020 was marked by the epidemic of the infectious disease COVID-19, the consequence of which is also visible in the field of road transport. Due to a series of measures to curb the epidemic, traffic on Slovenian roads decreased significantly in 2020 compared to 2019, which is mainly evident in April 2020 on state roads. According to unofficial data from automatic counting points (667 counting points), traffic on state roads has been declining since March. Traffic decreased the most during the first COVID-19 epidemic in the spring months (March 12 - May 14, 2020) and slightly less during the second part of the epidemic (October 19, 2020 onwards). In 2020, traffic on state roads decreased by an average of 18% per month (estimated according to unofficial data).

Data on the number of traffic accidents for 2019 and 2020 on motorways and expressways are shown in the table below:

Month	**Number of traffic accidents on AC and HC**		**Change 2019/2020**
	2019	**2020**	
January	148	127	-14%
February	123	112	-9%
March	148	92	-38%
April	154	41	**-73%**
May	196	84	**-57%**
June	236	140	-41%
July	221	180	-19%
August	199	155	-22%
September	225	136	-40%
October	182	155	-15%
November	176	85	**-52%**
December	177	155	**-12%**

A comparison of the number of road deaths between 2020 and 2019 also shows the largest positive differences in the months when the epidemic was declared, and the most negative in the months when the epidemic was not declared.



The figure above shows the number of deaths by individual periods. The period before the epidemic, the period of the 1st part of the epidemic, the summer months and the period of the 2nd part of the epidemic are highlighted. In the period March - May and in the period October - December, in 2020, compared to 2019, 24 fewer participants died. The second wave of the epidemic shows an even more concrete reduction in the number of deaths, and according to the above-mentioned data on the number of cities, the total volume of traffic was already higher than in the first wave.

The number of deaths in traffic accidents during the first and second epidemics compared to the previous year is shown in the table below:

PERIOD	Nr. Of death
15.3.2019 - 15.5.2019	17
15.3.2020 - 15.5.2020	12
comparison 20/19	**-29%**
PERIOD	Nr. Of death
19.10.2019 - 31.12.2019	17
19.10.2020 - 31.12.2020	4
comparison 20/19	**-76%**

To compare the state of road safety at European Union level in spring 2020, focusing on the impacts of the epidemic containment measures in this area, the report of the European Transport Safety Council (ETSC) of July 2020 can be used. The report points out that further research is needed to find out why the number of road deaths across Europe has not decreased in the same way as the volume of traffic.

At the same time, the report reveals that in April 2020, an average 36% drop in road fatalities was recorded at EU level compared to the 2017-19 average. In April 2020, 7 road users died in Slovenia, or 40% less than

in 2019 (5 less than in April 2019, 2 less than in April 2018 and 7 less than in April 2017). According to unofficial data from automatic counting points (667 counting points), the volume of traffic in Slovenia decreased most drastically in April 2020, by 53.51% (17% more than the EU average).

The largest decrease in the number of road fatalities was recorded in Italy (-84%) - no data on the decrease in traffic, followed by Belgium (-68%) with a 60% decrease in traffic, Spain (-63%) with a 75% decrease traffic volume, France (-61%) - no data on the decrease in traffic volume and Greece (-59%) - no data on the decrease in traffic volume. Ireland's statistics show that turnover fell by 65-70% in the week from 27 March to the end of April. The number of road fatalities decreased by 36% compared to the previous three years.

But the reduction in traffic did not lead to a reduction in the number of deaths in all countries. In Sweden (+ 2%), Denmark (+ 6%), the Netherlands (+ 13%) and Slovakia (+ 20%), the number of road fatalities is even higher than in previous years. In the Czech Republic, the number of fatalities increased by + 5% in April, despite a 65% decrease in traffic in settlements and by 70% on motorways.

In the neighbouring countries the situation was as follows: in Austria the number of deaths decreased by -9%, in Italy by as much as -84%, in Croatia by -35% with a simultaneous 50% reduction in traffic, and in Hungary by 49% with a 41% reduction in traffic.

The ETSC report highlights driving at unadjusted speeds and a higher number of vulnerable road users as possible causes. Data from 10 countries from the time of the first wave of the epidemic suggest that driving at an unadjusted speed could be an important factor in the increased risk of a car accident, which usually leads to more serious consequences and death.

Denmark has released official figures showing a 10% increase in the proportion of drivers overtaking.

French radar data showed a 16% increase in the most serious speeding offenses (50% above the legal speed limit) compared to the same period last year.

Estonia recorded a 22% increase in the share of drivers exceeding the speed limit on major rural roads, compared to the April 2018-2019 average.

In Spain, speeding offenses, as seen in the sample of fixed radars, on roads outside the settlement increased by 39% compared to the same period in 2019.

A British insurance company that uses telematics to monitor young policyholders has reported a 15% increase in speed warnings sent to drivers exceeding speed limits.

No increase in speed was recorded in Sweden.

For Slovenia, too, it cannot be said that speed was a key factor in the deterioration during epidemics, as the cause of "unadjusted speed" for a traffic accident in the first epidemic fell by a third, death by two thirds and minor injuries by a third. There were also a third fewer offenses. However, the number of serious injuries increased (23%). During the second declared epidemic, the share of traffic accidents due to unadjusted speed and their consequences also decreased, despite a fifth higher number of offenses. There were even fewer fatal traffic accidents. If we analyse in more detail the causes of fatal traffic accidents and the category, the data indicate that there were more deaths among the more vulnerable groups, and the wrong side / direction was crucial in as many as half of the 12 fatal traffic accidents. At the time of the second epidemic, exclusively

fatal participants were among the fatalities, and in 2 of the 4 fatal traffic accidents, the cause was unadjusted speed.

The tables below show the number of traffic accidents due to unadjusted speed during both epidemics and compared to the same period in 2019 and their consequences.

Spring 2020 epidemic

PERIOD	No. traffic accidents - the cause of unadjusted speed	Consequences (injuries)			Offenses
		Deaths	Severe bodily injury	Minor bodily injury	
15.3.2019 - 15.5.2019	502	9	39	282	20.460
15.3.2020 - 15.5.2020*	348	3	48	173	13.657
comparison 20/19	**-31%**	**-67%**	**23%**	**-39%**	**-33%**

The autumn-winter 2020 epidemic

PERIOD	No. traffic accidents - the cause of unadjusted speed	Consequences (injuries)			Offenses
		Deaths	Severe bodily injury	Minor bodily injury	
19.10.2019 - 31.12.2019	704	13	58	333	18.106
19.10.2020 - 31.12.2020*	493	2	19	176	21.680
comparison 20/19	**-30%**	**-85%**	**-67%**	**-47%**	**20%**

Spring 2020 epidemic - categories of 12 deceased participants: 3 car drivers, 2 cyclists, 4 motorcycle drivers, 2 moped riders, 1 passenger in a car.

Depending on the cause of the accident, 3 died due to unadjusted speed (1 motorcycle driver, 1 moped rider, 1 personal vehicle), 1 due to non-compliance with the priority rule (motorcycle driver), 1 cyclist due to moving a personal vehicle, 1 personal vehicle driver due to incorrect overtaking, and the other 6 due to incorrect side / direction of travel.

During the autumn-winter 2020 epidemic, out of 4 fatalities, the situation is as detailed according to the cause of the accident and the category of participant: 2 died of unadjusted speed (1 motorcyclist, 1 motorcyclist), 1 vehicle movement - 1 dead pedestrian, 1 wrong side / direction of travel (moped).

Alcoholic pathogens at the time of both epidemics and consequences

The impact of measures to curb the epidemic in Part 2 of the epidemic is visible with enhanced police control and all activities that could be carried out (actions: Slovenia blows 0.0, "Let's save lives, drive sober", well-known Slovenes with preventive messages) also in the field of alcoholics. By the end of September 2020, there were 3% fewer traffic accidents caused by alcoholics than in 2019. At the end of the year, there were 13% fewer such accidents. The number of deaths due to alcoholism also decreased from -11% at the end of September to -21% at the end of the year. The tables below show the number of traffic accidents caused by an alcoholic during both epidemics and compared to the same period in 2019, and their consequences.

Spring 2020 epidemic

PERIOD	No. traffic accidents - the perpetrator under the influence of alcohol	Consequences (injuries)		
		Deaths	Severe bodily injury	Minor bodily injury
15.3.2019 - 15.5.2019	235	8	20	100
15.3.2020 - 15.5.2020*	201	6	26	70
comparison 20/19	**-14%**	**-25%**	**30%**	**-30%**

The autumn-winter 2020 epidemic

PERIOD	No. traffic accidents - the perpetrator under the influence of alcohol	Consequences (injuries)		
		Deaths	Severe bodily injury	Minor bodily injury
19.10.2019 - 31.12.2019	350	5	27	135
19.10.2020 - 31.12.2020*	206	1	11	54
comparison 20/19	**-41%**	**-80%**	**-59%**	**-60%**

4.ANALYSIS OF COMPARATIVE STATISTICAL DATA

When reviewing the statistics for the comparative periods 2019 and 2020, we can see that traffic safety has improved. The biggest impact of improving traffic safety is due to the restriction of movement in measures to curb the epidemic, because by reducing the number of traffic participants, the number of possible dangerous situations is reduced. An interesting comparison is a comparison of the number of traffic accidents and deaths of participants during the second wave of the epidemic in the months of October to December. During this time, despite a small decrease in the number of traffic participants, the number of deaths in traffic accidents decreased and the month of December was the first month without fatalities in Slovenia. The better result of traffic safety was most likely influenced by the long curfew. The number of Sunday drivers has

also decreased, and daily migrations to and from work have also decreased to some extent. There are many other side factors that also affect the occurrence of traffic accidents, which are not defined in statistics and are impossible to monitor. The majority of traffic accidents are still due to unadjusted speed and drunk drivers, but both analysis show a large decline in the number of fatalities, especially during the second wave of the epidemic.

5.CONCLUSION

Traffic safety in Slovenia has greatly improved compared to the comparable period with 2019. The reasons for the improvement of traffic safety and the number of traffic accidents, as well as the number of dead participants, are listed in the previous paragraphs. The second wave of the epidemic in December brought the biggest improvement in traffic safety and consequently there were no fatalities on our roads, despite a comparable traffic density with the period in 2019.

In 2021, the consequences of the reduction in traffic at night, due to curfew during the epidemic, are reflected in an increased number of traffic accidents involving wildlife. By 22 April 2021, 243 animal traffic accidents had occurred. The reason for this is the adaptation of the animals to the lower traffic density during the epidemic and during curfew.

In addition to traffic accidents with wild animals, at the beginning of 2021 we recorded a major problem in the use of the seat belt of participants. In the first four months, as many as 15,000 violations were recorded due to the non-use of seat belts between drivers and passengers. As many as 2,000 violations were identified due to the non-use of child restraint systems in vehicles. In previous years, we recorded as much as 94% of drivers were wearing seat belt in Slovenia. This deterioration is mainly attributed to the relaxation of measures, the reduction of attention during relaxations and the lack of a daily routine of driving participants during the epidemic. However, "weekend drivers" are still a big problem. At that time, drivers are paying less attention to the road, the reasons for driving are different than during the week, and alcohol is often present.

However, general traffic safety is always most dependent on ourselves, as road users. We must always make sure that we drive in accordance with traffic regulations, that we follow safety measures, that we do not drive under the influence of alcohol and that we are always paying attention to the road while driving. In this way, we will make the greatest contribution to reducing traffic accidents and, consequently, fatalities on our roads.

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STROJARSKA I PROMETNA ŠKOLA VARAŽDIN, **Varaždin, 29.05.2021.**
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BICIKLISTIČKI PROMET I BICIKLISTIČKA PROMETNA INFRASTRUKTURA U GRADU VARAŽDINU

Sažetak:

Obilježja Grada Varaždina uvjetuju način odvijanja njegovih osnovnih funkcija pa tako i funkcije prometa. Promet je jedna od temeljnih funkcija koja omogućava zadovoljavanje potreba stanovništva i gospodarstva.

Nužna pretpostavka za uspješno odvijanje prometne funkcije je odgovarajuća infrastruktura za određenu vrstu prometa uz uvažavanje potreba prometa unutar područja grada i povezivanja s vanjskim prometom šireg teritorijalnog značaja.

Grad Varaždin je grad duge povijesti s naslijeđenim sustavom gradskih ulica koje u velikoj mjeri imaju ograničenu širinu, nepravilan tok trase i veliki broj raskrižja. Takve okolnosti su nametnule potrebu rekonstrukcije ulične mreže i to osobito na glavnim i sabirnim ulicama. Za zadovoljavanje prometnih potreba najvažnije je primjereno dimenzioniranje prometnih površina i pravilan izbor prometnih sredstava.

Biciklistički promet u Gradu Varaždinu ima dugu tradiciju i značajnu ulogu. Korištenju bicikla kao prijevoznog sredstva pogoduje ravničarski teren i relativno male prostorne udaljenosti između mjesta rada, stanovanja i rekreacije (polazišta i odredišta putovanja). Osim toga, u suvremenim uvjetima života, biciklistički promet postaje poželjan oblik prijevoza jer je ekološki prihvatljiv, učinkovit i doprinosi očuvanju zdravlja osoba koje ga koriste.

Zbog navedenih prednosti biciklističkom prometu je potrebno osigurati odgovarajuću prometnu infrastrukturu čime bi se poboljšala sigurnost prometa, omogućilo masovnije korištenje bicikla kao i integracija s drugim oblicima javnog prijevoza.

Stoga je cilj ovoga rada prikazati postojeće stanje biciklističkog prometa u Gradu Varaždinu i ukazati na mogućnosti implementacije novih infrastrukturnih i logističkih rješenja u tom modu prijevoza.

Ključne riječi: *sigurnost prometa, biciklistički promet, biciklistička prometna infrastruktura, integrirani prijevoz*

1.Uvod

Biciklistički promet postaje sve prihvatljiviji oblik prometa u visokorazvijenim i nerazvijenim dijelovima svijeta. Razlozi za to su višestruki: ne zagađuje okoliš, ne stvara buku, ima pozitivan utjecaj na zdravlje pojedinca, prihvatljiva je nabavna cijena bicikla, biciklistička infrastruktura zauzima malo prostora te zadovoljava potrebe prijevoza velikog broja ljudi koji putuju na kraće udaljenosti. Zbog navedenih prednosti biciklistički promet ima osobiti značaj u gradskom prometu i to u gradovima koji imaju razvijen javni prijevoz kao i u gradovima bez javnog prijevoza.

Varaždin je grad relativno male površine s 2.945 ha na kojoj živi oko 47.000 stanovnika. Kao takav, Varaždin nije dovoljno velik za uvođenje isplativog javnog prijevoza, a nije niti dovoljno mali da se prostorne udaljenosti mogu savladavati pješačenjem. Zbog toga biciklistički promet u Varaždinu ima dugu tradiciju pa je grad dobio epitet „biciklistički grad“, kojeg danas više ne zaslužuje. U pravcu rješavanja problema, a u okviru projektne nastave u predmetima Prometna tehnika i Ceste i cestovni objekti, učenici Strojarske i prometne škole su pod vodstvom svoji nastavnika izradili Registar biciklističkih staza/traka za potrebe Upravnog odjela za komunalne poslove, urbanizam i zaštitu okoliša Grada Varaždina. Dio rezultata tih nastavnih aktivnosti obuhvaća prvi dio ovoga rada, a u drugom dijelu bit će prikazana moguća rješenja za unaprjeđenje biciklističkog prometa. Razrada tih rješenja uslijediti će kroz projektnu nastavu navedenih premeta s učenicima sljedeće generacije.

2.Prometna obilježja grada Varaždina

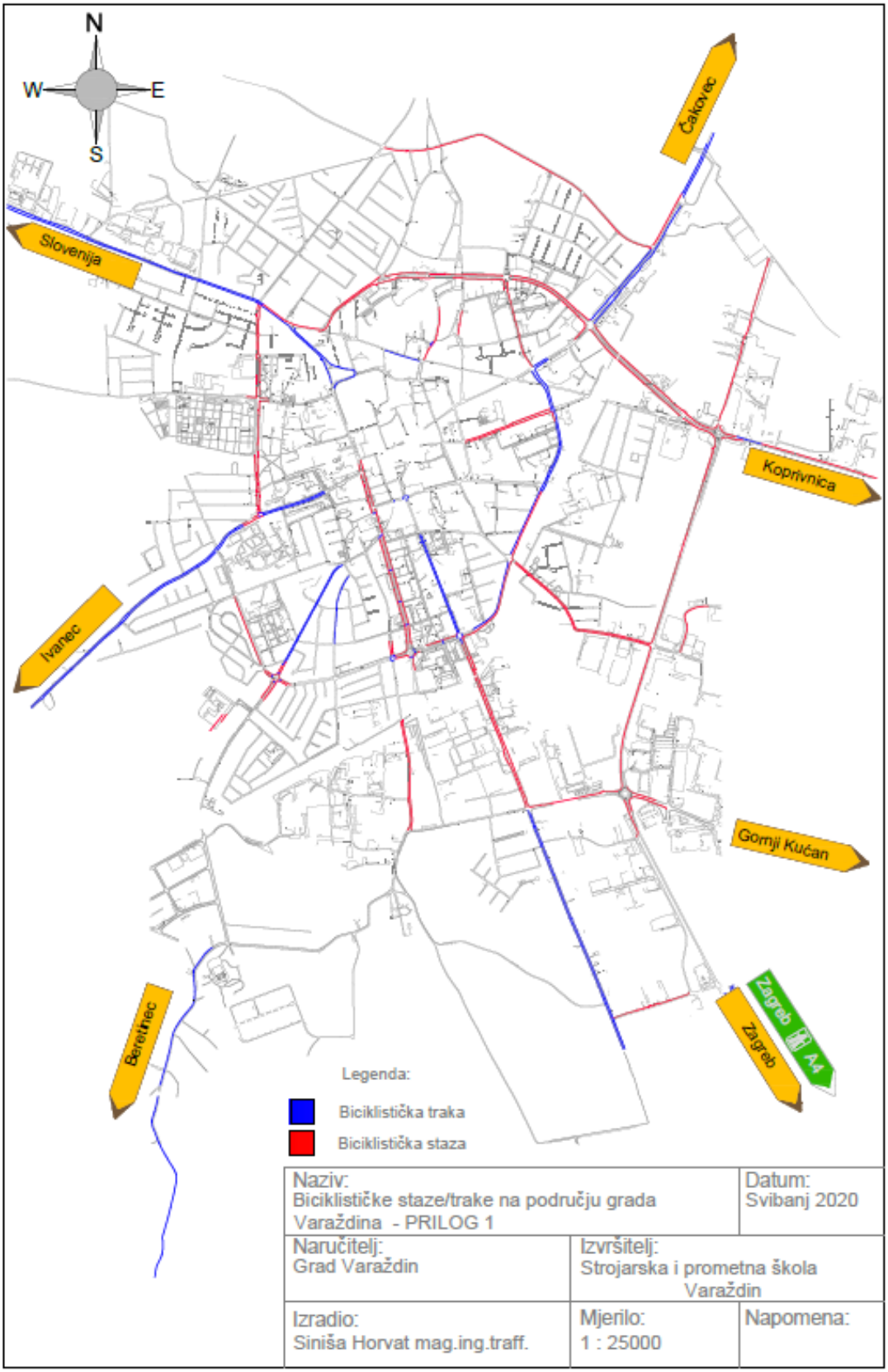
Grad Varaždin se nalazi na križanju međunarodnih cestovnih pravaca sjever-jug (Mađarska-Zagreb-Rijeka) i istok-zapad (Osijek-Koprivnica-Varaždin-Slovenija) te ima značajan tranzitni promet usmjeren na zaobilaznice Grada. Isto tako, Grad ima dobre željezničke veze prema sjeveru (Mađarska), istoku (Koprivnica) i jugu (Zagreb).

Ukupne prometne površine Grada iznose 226,49 ha što čini ukupno 8,17% cjelokupne površine, a najveći udio te površine zauzima ulična mreža. Ulična mreža ima naslijeđeni, nepravilan oblik koji je razvojem i rekonstrukcijama oblikovan u prstenasti i poluprstenasti raspored ulica povezan s radijalnim pravcima u nastavku državnih ili županijskih cesta.

Prometne površine u gradskoj jezgri prvenstveno su namijenjene pješačkom prometu, a ulična mreža izvan tog područja svim sudionicima u prometu. Dio ulične mreže ima posebno izgrađene i obilježene biciklističke površine i to prvenstveno uz glavne i sabirne ulice.

3.Biciklistički promet u Varaždinu

Na području Grada Varaždina biciklističke površine namijenjene kretanju biciklista obuhvaćaju 28,5 dužna kilometara ulične mreže. Od te duljine 22,2 kilometara su biciklističke staze ili trake koje omogućavaju kretanje bicikla u oba smjera, dok je 6,3 kilometara samo uz jedan rub kolnika ulice za jedan smjer kretanja bicikla (slika 1).



Slika 1. Postojeća mreža biciklističkih staza/traka u gradu Varaždinu

U ukupnoj duljini biciklističkih prometnih površina biciklističke staze i trake su podjednako zastupljene. Biciklističke trake, koje čine sastavni dio kolnika, a od prometne trake namijenjene kretanju vozila su odvojene uzdužnom razdjelnom linijom, najvećim dijelom se nalaze u ulicama koje su nastavak državnih ili županijskih cesta a to su Optujska ulica (D2), Ulica braće Radić (D35), te veći dio Jalkovečke ulice (Ž2050), Zagrebačke ulice (D3), Supilove ulice (D3) i Međimurske ulice (D3).
Bicilističke staze, odvojene prometne površine od kolnika, nalaze se uz ulice koje su građene ili rekonstruirane u novije vrijeme, odnosno gdje su prostorne mogućnosti omogućavale takvu izvedbu. Najduže dionice biciklističkih staza nalaze se uz Bombelesovu cestu, Koprivničku ulicu, ulicu Ruđera Boškovića, ulicu Kralja Petra Krešimira IV, Ratimira Hercega i Gustava Krkleca, ulicu Ivana Severa, Istočnu zaobilaznicu te većim dijelom ulice Vilka Novaka, Zagrebačke ulice, ulice Zrinskih i Frankopana i Biškupečke ulice.
Širina biciklističkih staza i traka varira od 0.70 m do 2,5 m ali je na većini dionica zadovoljavajuća, odnosno veća od jednog metra.
Horizontalna i vertikalna prometna signalizacija kojom se obilježavaju biciklističke staze i trake je u značajnoj mjeri nedostatna ili nepravilno postavljena.
Mreža biciklističkih staza i traka omogućava povezivanje periferije grada sa centrom grada te kretanje biciklista duž nepotpunog prstena ulica oko šireg centra grada kao i duž poluprstena koji povezuje istočna obilaznica i Koprivnička ulica.

<u>Dobri primjeri izvedbe i označavanja biciklističkih površina:</u>

Slika 1. Biciklistička traka

Slika 2. Pješačka i biciklistička staza

Slika 3. Dvosmjerna biciklistička i pješačka staza

Slika 4. Prijelaz biciklističke staze u biciklističku traku

Primjeri pogrešaka u izvedbi, označavanju i korištenju biciklističkih površina:

Slika 5. Valovit uzdužni tok trase biciklističke staze

Slika 6. Velik uzdužni nagib prijelazne rampe između kolnika i biciklističke staze

Slika 7. Neočekivan završetak biciklističke staze

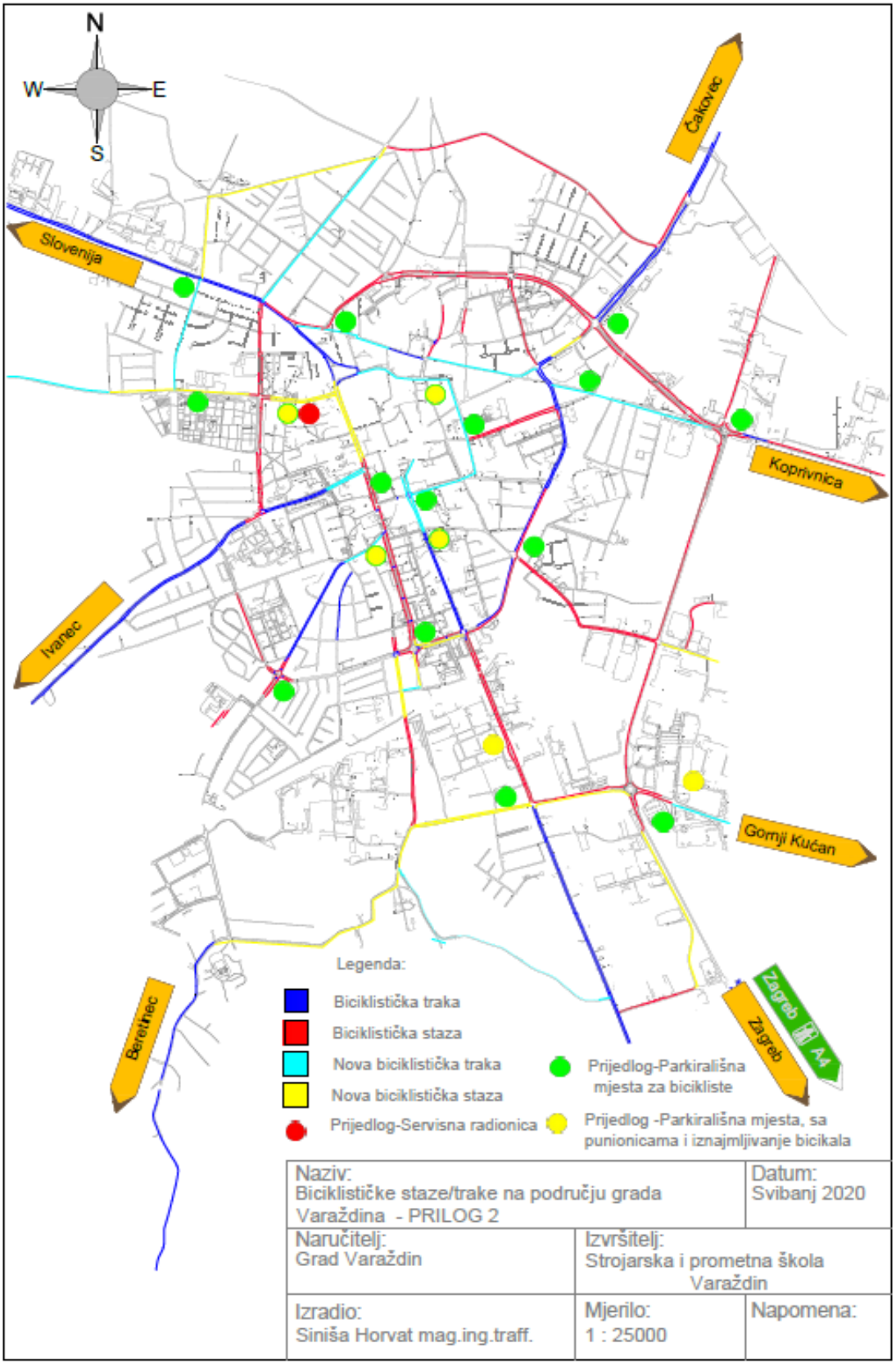
Slika 8. Obilježena nepostojeća pješačka i biciklistička staza

Slika 9. Preuska i horizontalno neobilježena pješačka i biciklistička staza

Slika 10. Nepravilno parkiranje na biciklističkoj traci

4.Mogućnosti implementacija novih rješenja u biciklističkom prometu grada Varaždina

Preduvjet implementacije novih logističkih rješenja u biciklističkom prometu je **dogradnja i umrežavanje biciklističkih staza/traka**. U tom smislu, potrebno je dograditi 3,6 km biciklističkih staza (na slici 11 označeno crvenom linijom). i 3,3 km biciklističkih traka(na slici 11 označeno plavom linijom). Dio tih prometnih površina moguće je osigurati manjom rekonstrukcijom postojeće prometne infrastrukture, a dio izgradnjom novih površina. Time bi se povećala mreža biciklističkih staza/traka za 24%, i iznosila bi ukupno 35,4 km, a ostvario bi se sustav radijalno koncentrične mreže (slika 11) s tri prstena od kojih je vanjski prsten sa zapadne strane izdužen u prigradska naselja. Radijalni pravci povezali bi centar grada sa prigradskim naseljima i nastavno sa županijskim gradskim središtima i gradovima susjednih županija: istočno - prema Ludbregu i Koprivnici, južno - prema Novom Marofu i Zagrebu, zapadno - prema Ivancu i Krapini, sjevero-zapadno prema Sloveniji i sjevero-istočno prema Čakovcu.
Nakon dogradnje površina za kretanje bicikala, na čvorištima biciklističkih staza/traka i u blizini najčešćih odredišta putovanja (tržnica, autobusni i željeznički kolodvor, srednjoškolske i visokoškolske ustanove, studentski i đački dom, trgovački centri, sportski objekti…) treba izgraditi neophodna parkirališna mjesta. Na svim parkirališnim mjestima treba osigurati nadzor, a na nekima od njih postaviti punionice električnom energijom i opremu za iznajmljivanje javnih bicikala (na slici 11 označeno žutim točkama) kako bi se mogla ostvariti javna biciklistička usluga. Uz navedene stojne točke važan infrastrukturni sadržaj je i servisna radionica u kojoj bi se održavali bicikli s električnim pogonom i bez vlastitog pogona(na slici 11 označeno crvenom točkom).



Slika 11. Predložena mreža biciklističkih staza/traka i prateće infrastrukture u gradu Varaždinu

Izvedbu i opremanje parkirališnih mjesta treba prilagoditi lokaciji i očekivanom trajanju parkiranja bicikala (na parkiralištima s dužim parkiranjem osigurati čuvanje „pod ključem“) Moguće primjere rješenja prikazuju slike 12 i 13.

Slika 12 Natkriveno parkiralište

Slika 13. Parkiralište „pod ključem“

Javna biciklistička usluga podrazumijeva nadopunu (u velikim gradovima koji ima javni prijevoz putnika) ili supstituciju javnog gradskog prijevoza (u manjim gradovima gdje javnog gradskog prijevoza nema). Za pružanje te usluge nužna je nabava odgovarajućeg broja i ogovarajućih vrsta bicikala (sa ili bez vlastitog pogona), punionice za električne bicikle i informacijsko komunikacijski sustav koji podupire funkciju iznajmljivanje bicikala korisnicima. Sredstava za navedene potrebe u cijelosti ili u određenom omjeru osiguravaju fondovi za zaštitu okoliša ili EU fondovi, a izvedba tih rješenja je već provjerena u praksi.

Slika 14. Natkriveno parkiralište sa solarnom punionicom za električne bicikle

Slika 15. Parkiralište sa sustavom za iznajmljivanje bicikala

U cilju bržeg razvoja biciklističkog prometa potrebno je osigurati **integraciju s drugim vidovima prijevoza** jer bicikl može poslužiti kao nadopuna dužim putovanjima. U tom slučaju javna prijevozna sredstva trebaju omogućiti prihvat bicikla u ili izvan karoserije vozila, a sve to treba normativno regulirati.
Održavanje bicikala je također nužan preduvjet za razvoj biciklističkog prometa i s obzirom na relativno jednostavnu konstrukciju tog prijevoznog sredstva ne zahtijevaju se velika početna ulaganja u radionički prostor i opremu niti visoka stručna znanja tako da je opravdano to održavanje vezati uz školsku radionicu Strojarske i prometne škole u kojoj se provodi praktična nastava učenika strojarskih zanimanja.
Uz sve navedeno, razvoj biciklističkog prometa mora pratiti planska **edukacija** potencijalnih i postojećih biciklista kroz osnovno i srednjoškolsko obrazovanje te kroz cjeloživotno osposobljavanje. Učenici i nastavnici Strojarske i prometne škole iz sektora promet i logistika mogu dati svoj doprinos u provedbi edukacije.
Prema tome, mogućnostima unapređenja biciklističkog prometa u Varaždinu učenici i nastavnici Strojarske i prometne škole će se i dalje baviti u projektnoj nastavi i izvan nje.

Zaključak

Biciklistički promet postaje sve prihvatljiviji oblik prometa zbog pozitivnog utjecaja na zdravlje osoba, na zaštitu okoliša i na ekonomske učinke. Grad Varaždin ima dugu tradiciju biciklističkog prometa, ali u posljednje vrijeme ne prati razvojne trendove tog moda prijevoza. Svjesni te činjenici, na inicijativu Upravnog odjela za komunalne poslove, urbanizam i zaštitu okoliša Grada Varaždina i u suradnji sa Strojarskom i prometnom školom, izrađen je Registar biciklističkih staza/traka kao podloga za intenzivniji razvoj biciklističkog prometa u gradu. Izradom Registra u okviru projektne nastave izvršen je snimak cjelokupne biciklističke mreže i u digitalnom obliku ucrtan na predložak karte katastra. Na toj podlozi i otkrivenim nedostacima postojeće mreže biciklističkih staza /traka moguća je implementacija novih rješenja koja bi doprinijela razvoju biciklističkog prometa. Prvi korak je dogradnja i umrežavanje biciklističkih staza/traka što podrazumijeva rekonstrukciju postojeće prometne infrastrukture i izgradnju novih dionica u duljini približno 7 km. Tada bi radijalno koncentričnom mrežom bilo povezano ukupno 35 km biciklističkih staza/traka. Potom bi se na značajnijim čvorištima trebalo izgraditi parkirališta od kojih bi neka imala punionice napajane solarnom energijom za električne bicikle. Izgradnjom takve infrastrukture stvorili bi se preduvjeti za pružanje javne biciklističke usluge čime bi se omogućilo iznajmljivanje bicikala potpomognuto informacijsko komunikacijskom tehnologijom. Daljnjom suradnjom Strojarske i prometne škole osigurali bi se potrebni resursi za održavanje bicikala i za edukaciju potencijalnih i postojećih korisnika biciklističkog prometa. Implementacijom navedenih rješenja Grad Varaždin bi s opravdanjem nosio naziv „biciklistički grad“.

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STROJARSKA I PROMETNA ŠKOLA VARAŽDIN, Varaždin, 29.05.2021.
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BICYCLE TRAFFIC AND BICYCLE TRAFFIC INFRASTRUCTURE IN THE CITY OF VARAŽDIN

Summary:

The characteristics of the City of Varaždin determine the manner in which its basic functions take place, including the functions of traffic. Transport is one of the basic functions that enables the satisfaction of the needs of the population and the economy.

A necessary precondition for the successful operation of the transport function is the appropriate infrastructure for a particular type of transport, taking into account the needs of transport within the city and connecting with external traffic of wider territorial importance.

The city of Varaždin is a city with a long history with an inherited system of city streets that are largely limited in width, irregular course and a large number of intersections. Such circumstances have imposed the need to reconstruct the street network, especially on the main and collection streets. To meet traffic needs, the most important thing is the appropriate sizing of traffic areas and the correct choice of means of transport.

Bicycle traffic in the city of Varaždin has a long tradition and significant role.

The flat terrain and relatively small spatial distances between places of work, housing and recreation (starting point and destination of travel) is favored by the use of bicycles as a mean of transport. In addition, in modern living conditions, bicycle traffic is becoming a desirable form of transportation because it is environmentally friendly, efficient and contributes to preserving the health of people who use it.

Due to the mentioned advantages, it is necessary to provide appropriate transport infrastructure for bicycle traffic, which would improve traffic safety, enable more mass use of bicycles as well as integration with other forms of public transport.

Therefore, the goal of this paper is to present the current state of bicycle traffic in the City of Varaždin and to point out the possibilities of implementing new infrastructural and logistical solutions in this mode of transport.

Keywords: *traffic safety, bicycle traffic, bicycle traffic infrastructure, integrated transpor*

1.Introduction

Bicycle traffic is becoming an increasingly acceptable form of traffic in highly developed and underdeveloped parts of the world. The reasons for this are multiple: it does not pollute the environment, it does not create noise, it has a positive impact on individual health, the purchase price of a bicycle is acceptable, cycling infrastructure takes up little space and meets the needs of transporting large numbers of people traveling short distances. Due to these advantages, bicycle transport is of particular importance in urban transport in cities that have developed public transport as well as in cities without public transport.

Varaždin is a city of relatively small area with 2,945 ha with a population of about 47,000. As such, Varaždin is not large enough to introduce cost-effective public transportation, nor is it small enough that spatial distances can be overcome by walking. That is why bicycle traffic in Varaždin has a long tradition, so the city received the epithet "cycling city", which it no longer deserves today. In order to solve the problem, and within the project teaching in the subjects Traffic Engineering and Roads and Road Facilities, students of the School of Mechanical Engineering and Traffic under the guidance of their teachers created a Register of bike paths / lanes for the Administrative Department of Communal Affairs, Urbanism and Environmental Protection of Varaždin. Part of the results of these teaching activities includes the first part of this paper, and the second part will present possible solutions for improving bicycle traffic. The elaboration of these solutions will follow through the project teaching of the mentioned subjects with the students of the next generation.

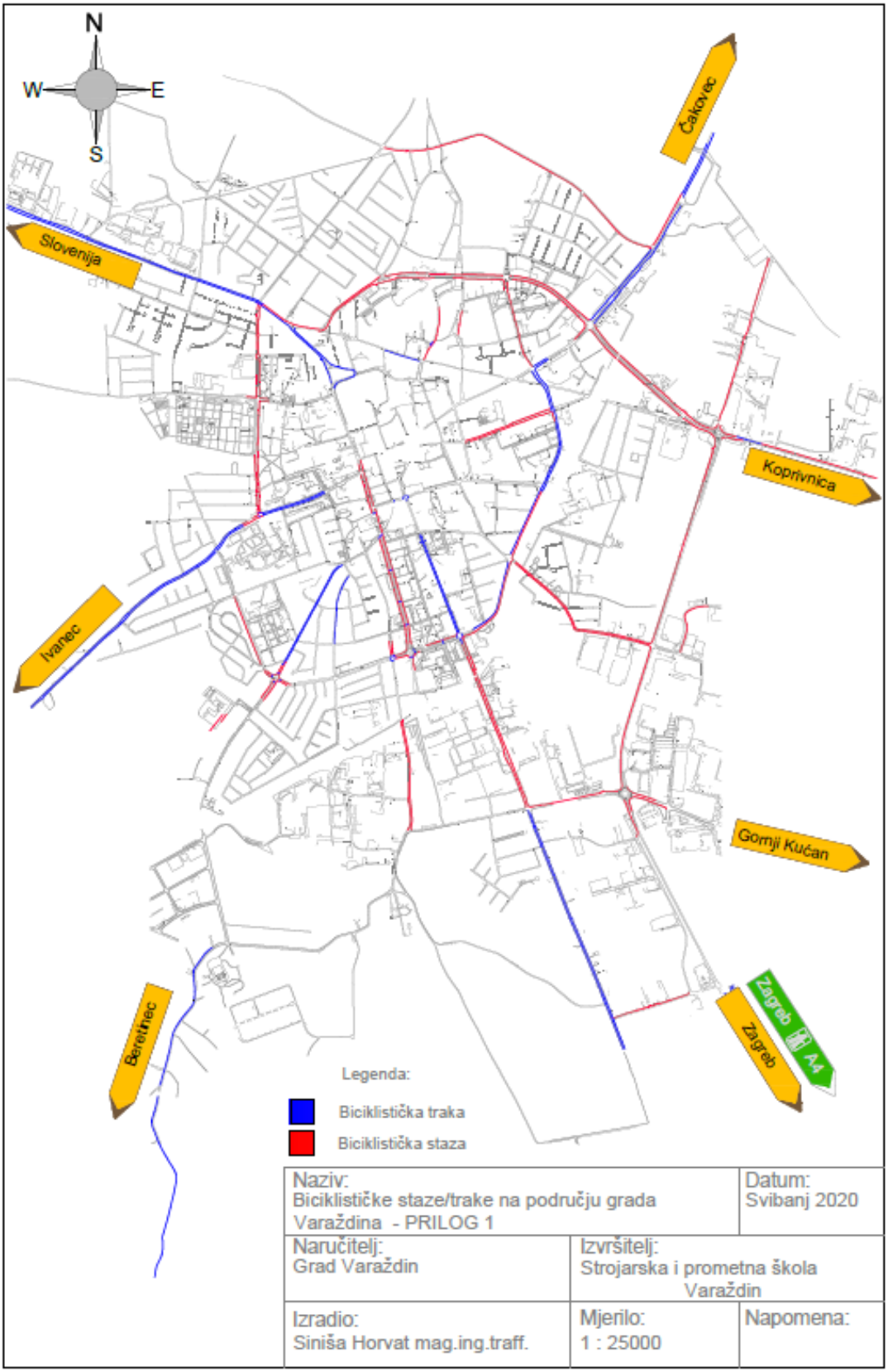
2.Traffic characteristics of the city of Varaždin

The City of Varaždin is located at the intersection of international road routes north-south (Hungary-Zagreb-Rijeka) and east-west (Osijek-Koprivnica-Varaždin-Slovenia) and has significant transit traffic directed to the bypasses of the City. Also, the city has good railway connections to the north (Hungary), east (Koprivnica) and south (Zagreb).

The total traffic area of the City is 226.49 ha, which makes a total of 8.17% of the total area, and the largest share of that area is occupied by the street network. The street network has an inherited, irregular shape that has been developed and reconstructed into a ring and semi-ring layout of streets connected with radial directions in the continuation of state or county roads. Traffic areas in the city center are primarily intended for pedestrian traffic, and the street network outside of the area for all traffic participants. Part of the street network has specially built and marked bicycle areas, primarily along the main and collection streets.

3.Bicycle traffic in Varaždin

In the area of the City of Varaždin, bicycle areas intended for the movement of cyclists include 28.5 kilometers of street network. Of this length, 22.2 kilometers are bicycle paths or lanes that allow bicycles to move in both directions, while 6.3 kilometers are only along one edge of the roadway for one direction of bicycle movement (picture 1).



Picture 1. Existing network of bicycle paths / lanes in the city of Varaždin

In the total length of bicycle traffic areas, bicycle paths and lanes are equally represented.
Bicycle lanes, which are an integral part of the road, and are separated from the traffic lane intended for the movement of vehicles by a longitudinal dividing line, are mostly located in streets that are a continuation of state or county roads, namely Optujska Street (D2), Braće Radić Street (D35) , and most of Jalkovečka Street (Ž2050), Zagrebačka Street (D3), Supilova Street (D3) and Međimurska Street (D3).
Bicycle paths, separate traffic areas from the pavement, are located along the streets that were built or reconstructed in recent times, or where the spatial possibilities allowed such a performance. The longest sections of bicycle paths are along Bombelesova road, Koprivnička Street, Ruđera Boškovića Street, Kralja Petra Krešimira IV Street, Ratimir Herceg and Gustav Krklec Street, Ivana Severa Street, the Eastern Bypass and most of Vilka Novaka Street, Zagrebačka Street, Franko Zrinskih Street and Zrinskih Street. Biškupečke streets.
The width of bicycle paths and lanes varies from 0.70 m to 2.5 m, but on most sections it is satisfactory, or more than one meter.

Horizontal and vertical traffic signals marking bicycle paths and lanes are significantly insufficient or incorrectly placed.The network of bicycle paths and lanes enables the connection of the city periphery with the city center and the movement of cyclists along the incomplete ring of streets around the wider city center as well as along the half-ring connecting the eastern bypass and Koprivnička Street.

<u>Good examples of construction and marking of bicycle surfaces:</u>

Picture 2. Bicycle lane

Picture 3. Hiking and biking trail

Picture 4. Two-way bike and hiking trail

Picture 5. Crossing the bike path in the bike lane

Examples of errors in the design, marking and use of bicycle surfaces:

Picture 6. Wavy longitudinal flow of the transition bike path route

Picture 7. Large longitudinal slope of the ramp between the pavement and the bicycle path

Picture 8. Unexpected end of the bike path

Picture 9. Marked non-existent pedestrian and bicycle path

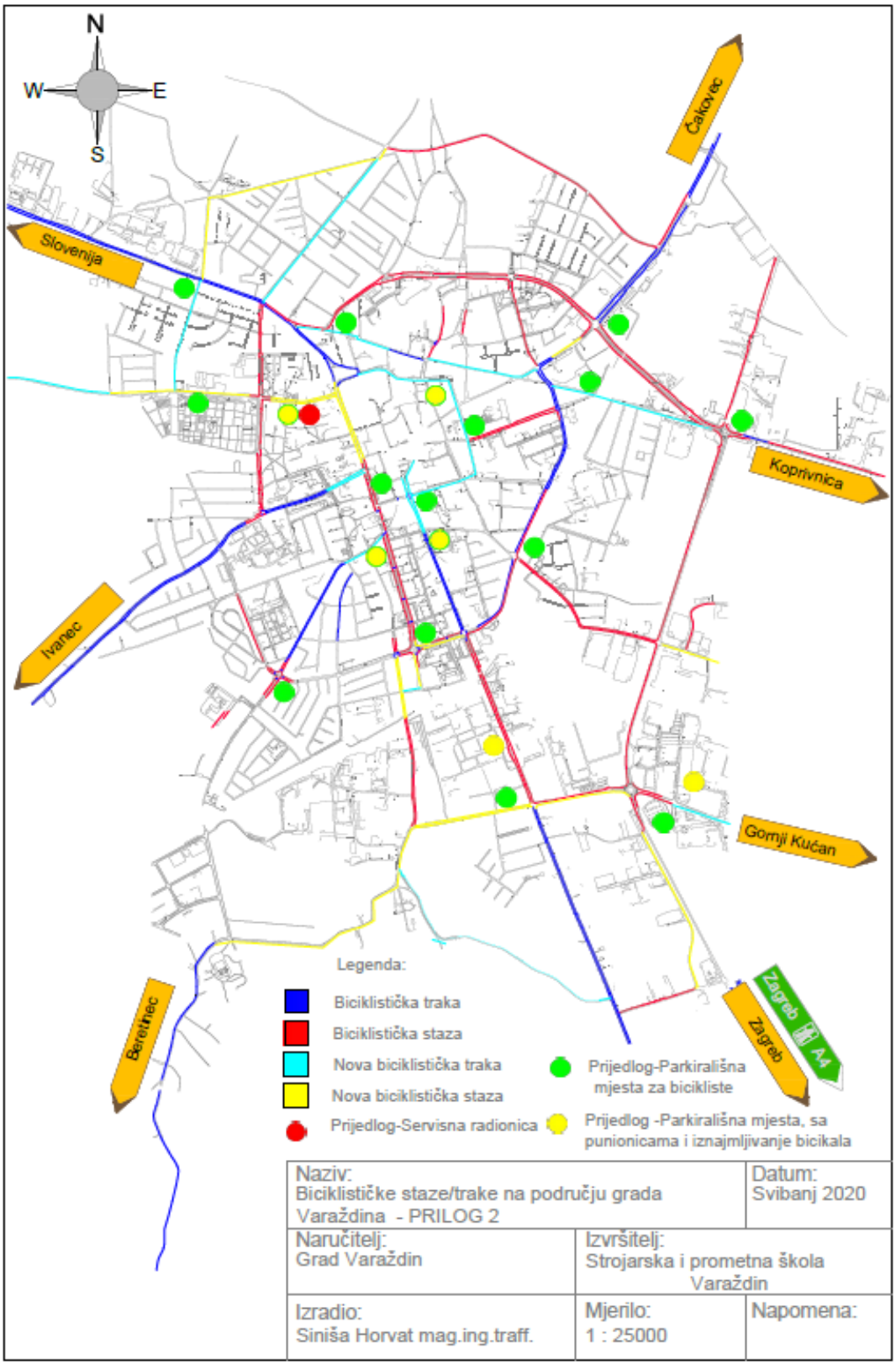
Picture 10. Too narrow and horizontally unmarked hiking and biking trail

Picture 11. Improper parking on biking trail

4.Possibilities of implementation of new solutions in bicycle traffic in the city of Varaždin

A prerequisite for the implementation of new logistics solutions in bicycle traffic is the upgrade and networking of bicycle paths / lanes. In this sense, it is necessary to upgrade 3.6 km of bicycle paths (marked with a red line in Picture 12) and 3.3 km of bicycle lanes (marked with a blue line in Picture 12). Part of these traffic areas can be provided by minor reconstruction of the existing transport infrastructure, and part by construction of new areas. This would increase the network of bicycle paths / lanes by 24%, and would amount to a total of 35.4 km, and would create a system of radially concentric network (Picture 12) with three rings of which the outer ring on the west side elongated into suburbs. Radial routes would connect the city center with suburbs and further with county town centers and cities of neighboring counties: east - towards Ludbreg and Koprivnica, south - towards Novi Marof and Zagreb, west - towards Ivanec and Krapina, north-west towards Slovenia and north- east towards Čakovec.

After upgrading bicycle areas, necessary parking spaces should be built at bicycle path / lane junctions and near the most common travel destinations (market, bus and train station, secondary and higher education institutions, dormitories, shopping malls, sports facilities…). Surveillance should be provided in all parking lots, and in some of them electricity charging stations and equipment for renting public bicycles should be installed (marked with yellow dots in Picture 12) in order to provide public bicycle service. In addition to the above-mentioned standing points, an important infrastructural content is a service workshop in which bicycles with electric drive and without their own drive would be maintained (marked with a red dot in Picture 12).



Picture 12. Proposed network of bicycle paths / lanes and accompanying infrastructure in the city of Varaždin

The design and equipment of parking spaces should be adapted to the location and expected duration of bicycle parking (in parking lots with longer parking, ensure "lock-in"). Possible examples of solutions are shown in Picture 13 and 14.

Picture 13. Covered parking lot

Picture 14. Turnkey parking

Public bicycle service implies supplementation (in large cities that have public transport of passengers) or substitution of public city transport (in smaller cities where there is no public city transport). To provide this service, it is necessary to purchase an appropriate number and appropriate types of bicycles (with or without own drive), a charging station for electric bicycles and an information and communication system that supports the function of renting bicycles to users. Funds for these needs are provided in full or in a certain proportion by environmental protection funds or EU funds, and the implementation of these solutions has already been tested in practice.

Picture 15. Covered parking lot with solar charging station for electric bicycles

Picture 16. Parking lot with bicycle rental system

In order to accelerate the development of bicycle traffic, it is necessary to ensure integration with other modes of transport, as the bicycle can serve as a supplement to longer journeys. In this case, public

transport should be able to accept the bicycle inside or outside the vehicle body, and all this should be regulated.

Bicycle maintenance is also a necessary prerequisite for the development of bicycle traffic and given the relatively simple construction of this means of transport does not require large initial investments in workshop space and equipment or high expertise, so it is justified to link this maintenance to the school workshop of Mechanical and Traffic School. practical classes for mechanical engineering students are conducted.

In addition to all the above, the development of bicycle traffic must be accompanied by planned **education** of potential and existing cyclists through primary and secondary education and through lifelong training. Students and teachers of the School of Mechanical Engineering and Transport from the transport and logistics sector can contribute to the implementation of education.

Therefore, students and teachers of the School of Mechanical Engineering and Traffic will continue to deal with the possibilities of improving bicycle traffic in Varaždin in project teaching and beyond.

Conclusion

Bicycle traffic is becoming an increasingly acceptable form of transport due to its positive impact on health, environmental protection and economic effects. The city of Varaždin has a long tradition of bicycle traffic, but in the recent times does not follow the development trends of this mode of transport. Aware of this fact, at the initiative of the Administrative Department of Communal Affairs, Urbanism and Environmental Protection of Varaždin and in cooperation with the School of Mechanical Engineering and Traffic, a Register of bike paths / lanes was developed as a basis for more intensive development of bicycle traffic in the city. With the creation of the Register, within the project teaching, a recording of the entire bicycle network was made in digital form on the template of the cadaster map. On this basis and the discovered shortcomings of the existing network of bicycle paths / lanes, it is possible to implement new solutions that would contribute to the development of bicycle traffic. The first step is the upgrade and networking of bicycle paths / lanes, which includes the reconstruction of the existing transport infrastructure and the construction of new sections in the length of approximately 7 km. In that case a total of 35 km of cycle paths / lanes would be connected by a radially concentric network. Then, parking lots should be built at major hubs, some of which would have electricity charging stations for electric bicycles. The construction of such infrastructure would create the preconditions for the provision of public cycling services, which would enable the rental of bicycles supported by information and communication technology. Further support from the School of Mechanical Engineering and Transport would provide the necessary resources for the maintenance of bicycles and for the education of potential and existing users of bicycle traffic. By implementing these solutions, the City of Varaždin would justifiably bear the name "cycling city".

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VARNOST UDELEŽENCEV V PROMETU

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POVZETEK

Za varnost v prometu je v sodobni družbi odgovoren človek. Družba v kateri živimo, pogojuje pravila prometnega vedenja in odnosa posameznika do uporabe prometnih storitev. Slovenija, v primerjavi z drugimi razvitimi državami, ima dobro prometno infrastrukturo. V zadnjih letih je bilo vloženih več evropskih sredstev v prometno infrastrukturo namenjeno zdravemu načinu življenja. Naloga države in lokalne skupnosti je izobraževanje občanov za varno uporabo prometne infrastrukture in za pozitiven odnos do soudeležencev v prometu.

Ključne besede: promet, varnost, izobraževanje, lokalna skupnost.

1.VARNOST V PROMETU

VARNO SODELOVANJE V PROMETU

Varnost v prometu je poglavje sodobne družbe, ki je močno vezana na odgovornost posameznika v družbi. Različne kulture posvečajo različno pozornost varnosti v prometu. Države s številčnejšim prebivalstvom imajo razvito mrežo javnih prevoznih sredstev. Tukaj mislim predvsem na podzemne železnice, ki jih Slovenija nima. Študirala sem izkušnje številnih držav, ki se že desetletja srečujejo z močnimi prometnimi tokovi, kažejo, da je za učinkovito in varno integracijo vseh udeležencev v prometu ključna integracija posameznika v družbo, v kateri živi in sprejema varne prometne tokove kot del osebne in družbene kulture, predpogoj zanje pa je izobraževanje. Izobraževanje predstavlja pomemben del za vsakega posameznika v različnih življenjskih obdobjih.

Ko sem sem potovala po Japonski, me je presenetila vljudnost in pozornost udeležencev v prometu. V turističnem mestu Takayama smo se Slovenci sprehajali po vozišču misleč, da je pločnik. Voznik avtomobila je vljudno počakal, da smo se mi spomnili, da se moramo umakniti. Razmišljala sem, kako smo Slovenci vzgojeni, da nismo ugotovili, da smo stali na cesti. Predstavljala sem si sebe, kako bi nervozno odreagirala v podobni situaciji. Kultura Slovencev do soudeležencev v prometu je nizka. Izgovarjamo se, da se nam mudi. Pomislim, kako nam mediji prikazujejo Japonsko kot deželo ljudi, kjer se jim vedno mudi, da nimajo časa niti za družino. Moje osebne izkušnje so, da so prebivalci Japonske umirjeni, vljudni, vljudni tudi kot udeleženci v prometu. Železniške postaje so mesto, kjer je neskončno število ljudi, ki čakajo na prevoz. Mirno se postavijo v vrsto in promet se odvija tekoče. Kolesarjev sem srečala malo. Tisti, ki se vozijo s kolesom, upoštevajo prometne predpise in nihče ne uporablja zvonca. Pešci prečkajo cestišče na zato označenem mestu. V danem trenutku še danes pomislim, da bi živela na Japonskem.

Moja naslednja izkušnja je Vietnam. Ko sem stopila iz letališča, sem pomislila, tukaj pa ne bo šlo peš. Taksist me je odpeljal do hotela. Dosledno je upošteval prometne predpise, saj tako sem si mislila v strahu, kako se bom znašla peš. Na ulici je polno peščev, kolesarjev in avtomobilov. Vse se premika hkrati in vse poteka tekoče. Pogled na množico daje vtis, da pešci ne morejo nikoli in nikjer prečkati ceste. Domačine sem

spraševala, koliko ljudi umre na dan v prometnih nesreča, pa so bili začudeni, da ni nesreč, morda je včasih kdo prehiter in se ponesreči. Semaforjev je v Hanoju za moj občutek glede na število prebivalcev zelo malo. V Slovenijo sem se vrnila z zmedenimi občutki, vendar s prijetnimi, da sem se znašla v prometnem kaosu. Ko sem se vrnila v Celje, sem opazovala promet od železniške postaje do Hudinje – 7 semaforjev, 7 rdečih luči za avtomobile in nikjer nobenega pešca.

Še večja gneča in občutek nevarnosti sem doživela v Teheranu. Šoferji ne upoštevajo zelene luči za pešce. Če sem imela srečo, sem se prebila na drugo stran ceste. Če ni bilo nujno, nisem prečkala ceste.

Z vidika ugotavljanja prometne varnosti v Sloveniji razmišljam, da so pokrajine v Sloveniji zelo specifične in so glede prometne ureditve specifike opazne že znotraj mest, kaj šele vasi. Razmišljam v smeri demografskih sprememb, ki so tudi posledica ekonomskih migracij, ki so lahko dnevne ali tedenske. Obseg priseljevanja v glavno mesto se v zadnjih letih povečuje. Predstavljam si, da je sprehod po Ljubljani drugačen od sprehoda po vasi na obrobju Celja. Tukaj moramo sesti v avto in se odpeljati na sprehod ob Savinji. Da bi se lahko odpeljali v službo s kolesom, nimamo realne možnosti, ker ni kolesarskih stez. Po cestišču se je voziti zelo nevarno, ker nekateri vozniki ne upoštevajo omejitve hitrosti. Še v slabšem položaju so pešci. Če pogledamo glavno mesto, je vožnja s kolesi nekaj normalnega in razdalja 5km s točke A do točke B ne predstavlja ovire, da se ne pelješ po kolesarski stezi. V večjih slovenskih mestih si lahko sposodimo kolo, da se odpeljemo na želje cilj, seveda v okviru formirane trase, ki je po navadi vezana tudi na linijsko progo avtobusa. Če ima kraj status ne mestne četrti, je to težko. Nujno je, če se želiš voziti s kolesom, moraš imeti svoje kolo. Peš hoja tudi ni varna, ker infrastruktura tega ne omogoča, ker ni dovolj povezav s pločniki. Vozniki avtomobilov ne znamo biti pozorni na kolesarje ali pešce, ker jih je preprosto malo. V prestolnici pa isti vozniki ne znamo upoštevati pešcev. Iz tega vidika su nuji programi izobraževanja za varno udeležbo v prometu v različnih situacijah. V zadnjem času se pojavlja večje število turistov in priseljencev, kateri prihajajo iz različnih kulturnih območij z različnimi navadami v prometu. Tukaj pogrešam na informacijskih točkah navodila za varno udeležbo v prometu. Z anketnega vprašalnika sem ugotovila, da še nihče ni slišal, da bi bila navodila za varno udeležbo v prometu javno dostopna na informacijskih točkah.

Za doseganje standardov zmožnosti varne udeležbe v prometu, je nujno vseživljenjsko izobraževanje s področja prometne varnosti. Projektno učenje omogoča udeležencem, da se povezujejo z različnimi posamezniki in institucijami v okolju, s katerimi lahko pridejo v stik v procesih integracije v različnih prometnih situacijah v različnih življenjskih obdobjih.

Prisotnost prometne vzgoje in učenja v vseh življenjskih obdobjih je v Sloveniji zapisana v dokumentu, ki se imenuje Resolucija nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022.

PROMETNA VZGOJA IN UČENJE V VSEH ŽIVLJENJSKIH OBDOBJIH

Slovenija je v ključnih strateških razvojnih dokumentih zapisala smernice za izobraževanje in usposabljan udeležencev v prometu v vseh starostnih kategorijah. Ta dokument se imenuje Resoluciji nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022, kjer je zapisano, da morajo vsi državljani dobiti kakovostno splošno izobrazbo in razviti sposobnosti za vseživljenjsko učenje. Slovenija se trudi, da v sistemu izobraževanja razvija pluralizem v smislu, da udeleženci razvijajo različne vrste pismenosti in si pridobivajo različne kompetence. Pomembna kompetenca je razvijanje odgovornosti zase in za delovanje v

družbi. Odgovornost je širok pojem in se skozi različna življenjska obdobja spreminja. V prispevku bom izpostavila odgovornost za varnost v prometu.

V prvi vrsti odigra pomembno vlogo izobraževanje, ki se prične v zgodnjem otroštvu in se zaključi z našo minljivostjo. Odgovorno obnašanje udeležencev v prometu je sestavni del kulture naroda, ki prispeva do izoblikovanja stališč in ciljev v šolskem kurikulu.

ODGOVORNOST IN IZOBRAŽEVANJE V PROMETU

Prometna vzgoja in vseživljenjsko učenje za varno sodelovanje v prometu poteka v več življenjskih obdobij, ki bistveno vplivajo na organiziranost, vsebine in oblike dela:

• *prvo življenjsko obdobje (nosečnost in prvo leto življenja),*

• *prometna vzgoja v predšolskem obdobju,*

• *prometna vzgoja v obdobju izobraževanja v osnovni šoli,*

• *varnost v obdobju poklicnega in srednješolskega izobraževanja,*

• *usposabljanje za vožnjo motornih vozil,*

• *vseživljenjsko učenje za varno sodelovanje v prometu.*

Prometna varnost je pomemben dejavnik kvalitete bivanja in se nanaša na vse državljane skupaj in vsakega od njih posebej. Občinski sveti za preventivo in vzgojo v cestnem prometu je izvajajo preventivne aktivnosti v samoupravnih lokalni skupnostih. Zato je prioriteta njihovega nadaljnjega razvoja do leta 2021 začrtana v naslednjih 11 točkah:

• *ohranitev in nadgradnja vseh obstoječih kakovostnih preventivnih programov,*

• *prilagajanje organizacijsko-pravnega statusa občinskih SPV njihovim nalogam in funkcijam,*

• *občinski SPV postajajo tudi »ogledalo« kvantitete in kakovosti dela državnih organov in organizacij na področju varnosti cestnega prometa,*

• *organizacija usposabljanja in izpopolnjevanja znanj s pomočjo domačih in tujih strokovnjakov,*

• *pomoč Javne agencije RS za varnost prometa s strokovnimi mnenji o lokalnih prometno-varnostnih problemih,*

• *skupno spremljanje varnosti cestnega prometa na lokalni ravni,*

• *nakup in uporaba preventivnih demonstracijskih naprav,*

• *večja medijska promocija prometnih vsebin,*

• *priprava strategije vzgoje in izobraževanja—vključitev prometnih vsebin v šolski sistem in izobraževanje odraslih,*

• izvedba aktivnosti za zaščito najbolj ranljivih skupin udeležencev v cestnem prometu (starejši, mladi, pešci, kolesarji, motoristi),

• priprava dveletnih onih obdobnih načrtov na lokalni ravni:

- ✓ *izvedba akcijski ciljev;*
- ✓ *predstavitev izvedbeni akcijskih ciljev;*
- ✓ *osveščanje in obveščanje;*
- ✓ *organiziranje različnih aktivnosti, v katerih sodelujejo gibalno ovirane osebe;*
- ✓ *E-oskrba;*
- ✓ *obveščanje širše javnosti.*

https://www.gov.si/assets/ministrstva/MzI/Dokumenti/Resolucija-o-nacionalem-programu-varnosti-cestnega-prometa-za-obdobje-od-2013-do-2022.pdf

LOKALNA SKUPNOST IN VARNOST V PROMETU

Lokalna skupnost imama pomembno vlogo pri izobraževanju udeležencev v prometu, ko zaključijo formalno izobraževanje. V KS Škofja vas vsako leto organiziramo osveščanje za udeležence v prometu. Osveščanje temelji na dejstvu, da je najpomembnejši človek, le mi lahko prispevamo k oblikovanju ustreznih stališč do posameznih dejavnikov varnosti. Aktivnosti potekajo v okviru študijskih krožkov in akcijski cilj je opozoriti širšo javnost, kako pomembo vlogo odigra posameznik v prometu. Poudarjamo, kako pomembno je ozaveščanje, da ljudje sodelujemo pri prometni vzgoji na vseh nivojih. Ljudje na srečanjih pripovedujejo svoja doživetja in izkušnje in opozarjajo, česar ne bi nikoli naredili. Nekatere zgodbe zapišemo in ilustriramo. Širša javnost na teh srečanjih večkrat opozarja, da prometna stroka ne sliši glasu uporabnikov prometnih površin. Tukaj moram opozoriti, da si ljudje marsikdaj želijo prehodov za pešce na zelo prometnem delu cestišča. Stroka pa opozarja, da ni prehod za pešce vedno najboljša rešitev, če ni označen z ustrezno prometno signalizacijo, ga vozniki spregledajo in statistike opozarjajo, da je v teh primerih več nesreč, kot če prehoda ni. V izobraževanje vključimo tudi varnost na morju in v planinah. Včasih radi pozabimo, da z avtom ne smemo doseči vseh točk, čeprav nam sodobna prevozna sredstva to omogočajo. Te površine naj bodo namenjene pešcem.

V zadnjem času se z evropskimi sredstvi ureja prometna infrastruktura prijazna za vse udeležence v prometu. Kje je težava? Ljudje, ki so lastniki zemljišč, kjer bi se gradila ustrezna prometna infrastruktura, ne podpišejo odstopnih izjav za zemljišča in marsikateri projekt se ne izvede. Postopki za razlastitev lastnikov so tako dolgotrajni, da se zato namenjena sredstva preusmerijo v druge namene.

Naloga lokalne skupnosti je, da izobražuje ljudi o pomembnosti ustrezne prometne infrastrukture in o pomenu kakovostnega izobraževanja s področja prometne varnosti v vseh življenjskih obdobjih.

2. ZAKLJUČEK

Varnost v cestnem prometu je področje, ki je vpeto v vse družbene skupine. Pri analizi življenjskega stila ljudi so v prometno dogajanje v družbi vpete različne institucije, posamezniki, širša in lokalna skupnost. Marsikdaj kašni projekti na nacionalni ravni živijo v aktivni obliki, a zaradi demografske razdrobljenosti so težko dostopni, zato se konkretno vključi lokalna skupnost, ki razvija različna izobraževanja za potrebe širše javnosti. Mnoge slovenske občine se zavedo potrebe po izobraževanju o prometni varnosti in so se približale občanom s strokovno podporo in gradnjo ustrezne infrastrukture.

3. LITERATURA

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PARTICIPANTS OF ROAD SAFETY

Metka Hojnik Verdev, prof.

ABSTRACT

Road safety today depends on all the participants on the roads. The society in which we live in dictates road safety roles and the conduct of behaviour for traffic services. In comparison to other countries Slovenia has a good road infrastructure. In the last past years, the European union funds have been focused on enabling the healthy way of life when it comes to transportation and road infrastructure. The role of the local state and communities is to educate its citizens towards road safety and the safe use of road infrastructures and to create a positive attitude to other participants on the roads.

Key words: traffic, safety, education, local community.

1.ROAD SAFETY

SAFE PARTICIPATION IN TRANSPORT

Road safety presents a chapter in the modern society, which mostly depends on the responsibility of each individual. Different cultures pay different attention to road safety. The countries which have more citizens have developed a good public grid of means of transport. This is mostly seen in the underground railway transport; which Slovenia hose not have. The studies of many different countries show, that the countries which have dealt with massive transport currents, for them it is necessary to integrate all its participants in the transport. The integration in to a safe transportation begins in the integration of the individual in the society in general. The individual need to accept the safe transport currents as its own and as a part of the sociality culture. The base for a good integration in every part of a sociality is a good and efficient education system in every life time period.

When I was to Japan, I was surprised by their attention and kindness to all the road participants. In the tourist town of Takayama we were walking on the carriageway thinking it is the pavement. The driver was kind enough to wait for us to walk along and did not argues at all. My thoughts ware, how we are not educated to see that we are walking on the road and not the pavement. I imagined myself have I would nervously react in a similar situation. The Slovenian culture to road safety is in a low state. Our excuse is that we are constantly in a hurry. It reminded me to how the media is showing the Japanese culture to be always in a hurry. My personal experience is that the Japanese are calm, polite and most of all are polite when it comes to road behaviour. Their railway stations are like towns, where there are a massive crowds of passengers who are waiting for transportation. They calmly queue and the transport unrolls fluently. Those who use the bicycle abide the traffic regulations and nobody uses a bell. The pedestrians cross the road on the place marked for crossing. In this moment I imagine I could live in Japan.

My next experience is Vietnam. When I came out of the airport, here it is not going to go on foot. The taxi driver drove me to the hotel. He strictly obeyed the traffic regulations. My thoughts were how would I manage on foot. The road was full of cyclists, pedestrians and cars, which were all moving fast and everything was flowing currently. The side on the traffic makes you thing that the pedestrian cannot ever cross the road safety. I was asking the local residents who many accidents and fatal victims do they have on a daily basis, but they said that only a few get hurt and there are not many car accidents. The city of Hanoi, has only a few traffic lights considering the amount of inhabitants. When I returned to Slovenia, I had mixt

filings, because I ended up in a traffic jam. Only in the town of Celje, form the railway station to Hudinja, there was 7 traffic lights, 7 red lights for cars but not one pedestrian.

The most unsafe I felt in Teheran. The drivers do not respect the green light for the pedestrians. If I was lucky I could cross the road. So if it was not necessary I did not cross the road. The Slovenian transport safety mostly depends on the landscape and the specifics can be seen from towns to villages. Road safety and traffic currents are mostly the result of demographics changes that are accruing do to economical migrations, which can by weekly or daily. The daily migrations to the capital of the state is in decries in the last few years. I can imagine that a walk through the capital Ljubljana is very different as a walk on the outskirts of Celje. In Celje we have to take a car ride to get to the river Savinja, where we can enjoy a peas full stroll. There is now way we can go to work by bicycle because there are any cycling roads. When cycling we must use the road, but this can be dangerous because drivers do not obey the traffic regulations, and the speed limit. The far worst positions have the pedestrians. The drivers do not pay any attention to them, simply because they are so few, and the drivers overlook them. When we look at our capital it is easy to drive from point A to point B by bicycle as far as 5 km, because there are bicycling paths. In most of the main Slovenian cities we can rent a bicycle and ride in the formal route which corresponds with the route of the public transport. It the town has a non-city status this becomes difficult. There it is necessary to own your bicycle.

Overall the drivers tend to forget about the cyclists and pedestrians, especially in the city centres. Therefore, the education programs for road safety are urgent to remained all the participants of a variety of different road situations. Nowadays we have a lot of tourists and immigrants, who come from different cultural areas with different driving habits. Information points should provide information about safe road participation. A survey has shown that nobody has heard about a guide, on have to be safe on the roads which can be provided on the information points.

To reach the standardization on road safety we need to provide a lifelong learning education on road safety. Project learning enables the participants to be educated on road safety with in the integration in different traffic institutions and through individuals and in different life periods. The lifelong education on road safety is written in the document called the “Resolution on national road safety program from 2013 to 2022.

TRANSPORT EDUCATION AND LIFELONG LEARNING

Slovenia has incorporated the education and training for road safety in a key strategical document for all life categories. This document is called the Resolution on national road safety program from 2013 to 2022, where it is written that all the citizens must have access to a quality education and develop skills on road participation in all life periods. In Slovenia we are aiming towards pluralism in our education system, in the sense of making the participants gaining different competence and skills. An important competence is a sense of responsibility to one self and the society. Responsibility represents a wide concept and changes through different life periods. In this article I will focus on the responsibility on the road safety. The most important aspect of education begins in our childhood and ends with our transience. Responsible behaviour of the participants in transport presents a component in a national culture, which contributes to forming goals and viewpoints in a school curriculum.

RESPONSIBILITY AND EDUCATION IN TRANSPORT

Transport education and lifetime learning for road safety is divided in to different live periods which have an important role on their organization, teaching methods and contents:

- *first life period (pregnancies and the first year of life),*
- *traffic education in the preschool period,*
- *traffic education in the primary school,*
- *traffic education in the secondary and VET education,*
- *training for driving motorized vehicles,*
- *lifelong training for safe participation in traffic.*

Road safety presents an important aspect of the quality of living and is depending on each citizen together as a society and as an individual. Local councils for prevention and education of road traffic are performing prevention actions in self-management local communities. Therefore, their priority is outlined in following 11 points for the period up to 2021:

- *upholding and upgrading all the existing quality prevention programs,*
- *adjustment to the organizational – legal status of the Local councils for prevention and education of road traffic (LCP) to their assailment's and functions,*
- *local LCP are becoming a viewpoint for quality and quantity for the shear of work in the field of road safety,*
- *organization of training and upgrading knowledge with the help of local and foreign experts,*
- *the help of Public agency of the state of Slovenia for road safety with professional opinion on local transport – safety problems,*
- *monitoring road safety on local level,*
- *the purchase and use of prevention demonstration devices,*
- *more media coverage of road safety subjects,*
- *the preparation on road safety education – implementing them in the school system and the education of lifelong learning,*
- *performance of activities for the most vulnerable participations in road transport (elderly, children, pedestrians, cyclists, motorists),*
- *the preparation of two-year lasting education plans on local level:*
    - ✓ *the performance of action goals,*
    - ✓ *the presentation of the performed action goals,*
    - ✓ *informing the public,*
    - ✓ *organization of different activities where the participants are disabled persons,*
    - ✓ *e – care,*
    - ✓ *media support.*

https://www.gov.si/assets/ministrstva/MzI/Dokumenti/Resolucija-o-nacionalem-programu-varnosti-cestnega-prometa-za-obdobje-od-2013-do-2022.pdf

LOCAL COMMUNITIES ANR ROAD SAFETY

The local communities paly an important role in the education of road safety when the citizens finish their formal education. In the community of Škofja vas we each year organize an invent for informing the participants of road transport. The information is based on the fact that the most important part of road safety is the individual participant, and the knowledge that only we can act to prevent accidents on the road. The activates take place within the study groups and the activity goal is to point out to general public how an important part an individual can play in road safety. Also we aim to present the role of individual in all different levels. Participants of the study groups tell their experience of accidents and point out what they will never attempt again. Some of the stories are written and drown. The general public points out that the transport profession does not hear the voice of the transport users. Here we have to recognized that the pedestrians need more pedestrian's crossings. The experts respond that the crossings have to be properly signalized, because if they are not the driver will not see them and we will have even more car accidents. In our education we include the safety on the sea and in the mountains. We sometimes forget that not all areas are meant to be accessed by cars even if it is possible, but those areas need to be left to pedestrians. In the last few years the road infrastructure is funded by European funds and its aim is to be used by all citizens. Where is the problem? The owners of the properties where the roads or cycling paths are meant to be do not sing the resignation statement and therefore such a project are not carried out. The procedure for expropriation of the owners can take a huge amount of time, that the funds are redirected in to other project.

The role of the local community is to educate the people on the importance of proper traffic infrastructure and on the meaning on the quality education on the area of road safety in all life periods.

2. CONCLUSION

Road safety must be involved in all society groups. When analysing the life style of people, we find road safety and transport incorporated throw different institutes, individuals and the local communities. A lot of times some project concerning road safety are very much active on national form but do to demographic partition have low success on local level. There is where the local communities come to help, with education and prevention action. Many of the local communities are being aware of the need for education of road safety and are presenting their citizens with professional support on the subject and building proper transport infrastructure.

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РЕПУБЛИЧКИ
СОВЕТ ЗА БЕЗБЕДНОСТ
НА СООБРАЌАЈОТ
НА ПАТИШТАТА

м-р Гордана Кожуваровска[99]

Младите и возачите почетници - ризична и ранлива група учесници во сообраќајот

Резиме

Сообраќајот на патиштата е важен сегмент за економскиот просперитет, стопанскиот и општествениот развој на секоја држава. Иднината и развојот на една држава не може да се оствари без обезбедување на безбеден и протечен сообраќај.

Бројот на возила, бројот на возачи и интензитетот на сообраќајот во Република Северна Македонија и на светско ниво постојано расте, а во исто време, за жал, сообраќајните незгоди стануваат наше секојдневие. Глобалната епидемија на настрадани лица во сообраќајни незгоди што го зафати светот изминативе години, не ја одмина и Република Северна Македонија. Големиот број загубени човечки животи во сообраќајни незгоди се тешка и ненадоместлива општествена загуба. Особено тешка и голема е загубата кога станува збор за загубени животи на деца и млади.

Сообраќајните незгоди претставуваат една од водечките причини за смртност кај луѓето, особено кај младите. На светско ниво, според официјалната статистика, 1.3 милиони луѓе годишно го губат животот во сообраќајни незгоди, од кои околу 25% се млади лица на возраст до 29 години. Околу 50 милиони лица годишно се здобиваат со тешки телесни повреди, од кои голем број и со траен инвалидитет, исто така како последица од неодговорно учество во сообраќајот.

Во Република Северна Македонија, во просек 150 лица годишно го губат животот во сообраќајни незгоди, иако таа бројка постепено но сигурно се намалува во последните години. Од нив, околу 25% се млади луѓе.

Ваквата состојба на патиштата не можеме и не смееме да ја прифатиме како сурова и неминовна реалност со која не можеме да се справиме, туку напротив – оваа црна статистика дополнително нè предизвикува и нè обврзува сите нас, како институции и како поединци, да дадеме свој придонес во процесот на подобрување на безбедноста на сообраќајот на патиштата.

Целта на овој труд е да се утврдат состојбите со безбедноста на младите во сообраќајот, да се анализираат причините за сообраќајни незгоди и да се предложат мерки за поголема безбедност на младите во сообраќајот.

[99] Републички совет за безбедност на сообраќајот на патиштата на Република Северна Македонија (РСБСП)

Клучни зборови: млади, возачи почетници, безбедност, сообраќајни незгоди, жртви.

1.Вовед

Младите возачи и возачите почетници се најранлива категорија учесници во сообраќајот, но и најчесто грешат во него. Според Републичкиот совет за безбедност на сообраќајот на патиштата, грешките се непромислени и ненамерни бидејќи во голем дел од ситуациите тие се направени за прв пат или не се направени свесно.

Секој млад човек (кандидат за возач) кога прв пат ќе седне во автомобил да учи да вози, обично е многу внимателен и подготвен да слуша и да ги применува советите од инструкторот. Но, откако ќе се стекне со возачка дозвола и со минимум возачко искуство, наеднаш работите се менуваат, на површина излегува преголемата самодоверба врз основа на лажна перцепција за „големите“ возачки способности. Тогаш се прават најголемите грешки во сообраќајот, а епилогот од таквото однесување најчесто е погубен и фатален.

Една од најопасните грешки што младите возачи ја прават е брзото возење и тоа најчесто во доцните вечерни или во раните утрински часови. Возењето во услови на мрак и намалена видливост носи предизвици и опасности. Кога на тоа ќе се додаде брзото возење, неискуството и заморот од „напорната“ ноќ, тогаш заканата станува многу сериозна и загрижувачка. Посебно „популарни“ во летниот период се уличните трки во доцните вечерни часови кога булеварите и улиците се празни и кога возачите можат „да си ги измерат силите“.

Една од грешките што скоро никој и да не ја забележува е **одвлеченото внимание.** Една статистика вели дека 15% од сите незгоди во кои учесници биле млади возачи се случиле кога во возилото освен возачот имало повеќе од еден патник на иста или на приближно иста возраст. Младите возачи забавата со друштвото ја продолжуваат во возилото, низ градските улици, а желбата за докажување пред друштвото ги води кон фатален исход.

Речиси и да нема млад човек – возач кој овие факти не ги знае или не е свесен за нивната важност. Сите ги знаат фактите, ризиците и опасностите, но не сите се придржуваат до нив.

Младите возачи и возачите почетници се предмет на зголемен ризик за учество во сообраќајна незгода. Во текот на изминатата деценија има зголемување на процентот на младите возачи во вкупниот број на загинати, а лицата под дваесетгодишна возраст сè уште претставуваат ризична група на учесници во сообраќајот.

2. Состојби со безбедноста на младите во сообраќајот на светско ниво

Според податоците на СЗО, годишно во светот околу 400.000 млади лица го губат животот во сообраќајни незгоди. Тоа значи дека 1.100 млади лица на возраст до 25 години секој ден го губат животот во сообраќајни незгоди низ целиот свет. Сообраќајните незгоди се водечка причина за смртност на лицата на возраст од 15 до 19 години, а втора причина за смртност за лицата на возраст од 10 до 14 години и втора причина за смртност за лицата на возраст од 20 до 24 години (Табела 1).

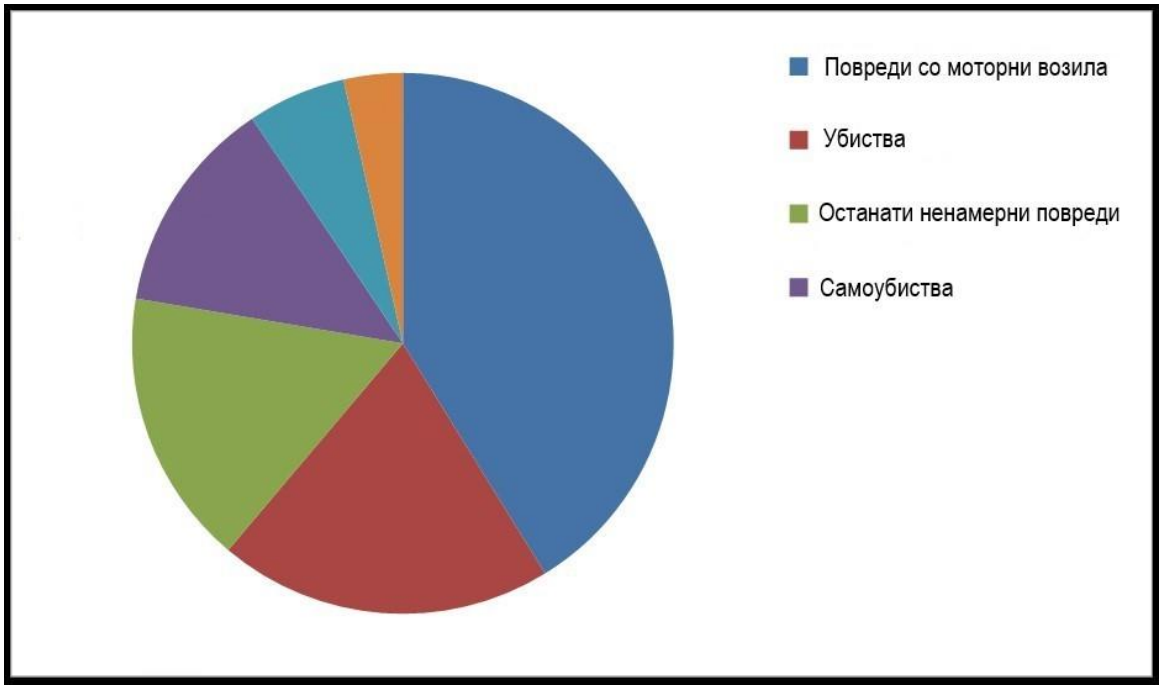
Табела 1. Причини за сообраќајни незгоди и возраст на учесници во сообраќајни незгоди

Ранг	< 1 год.	1 до 4 год.	5 до 9 год.	10 до 14 год.	15 до 19 год.	20 до 24 год.	Сите < 25 год.
1	Перинатални состојби	Долни респираторни инфекции	Долни респираторни инфекции	Долни респираторни инфекции	Повреди во сообраќајни незгоди	ХИВ/СИДА	Перинатални состојби
2	Дијареални состојби	Кластер детски болести	ХИВ/СИДА	Повреди во сообраќајни незгоди	Самонанесени повреди	Повреди во сообраќајни незгоди	Долни респираторни инфекции
3	Долни респираторни инфекции	Дијареални состојби	Повреди во сообраќајни незгоди	Давење	Родителство	Самонанесени повреди	Дијареални состојби
4	Маларија	Маларија	Кластер детски болести	ХИВ/СИДА	Долни респираторни инфекции	Родителство	Кластер детски болести
5	Кластер детски болести	ХИВ/СИДА	Давење	Туберкулоза	Меѓучовечко насилство	Меѓучовечко насилство	Маларија
6	Вродени аномалии	Перинатални состојби	Менингитис	Протеин-енергетска неухранетост	Давење	Туберкулоза	ХИВ/СИДА
7	ХИВ/СИДА	Протеин-енергетска неухранетост	Изгореници	Изгореници	Туберкулоза	Долни респираторни инфекции	Вродени аномалии
8	Протеин-енергетска неухранетост	Вродени аномалии	Туберкулоза	Меѓучовечко насилство	Изгореници	Изгореници	Повреди во сообраќајни незгоди
9	Сифилис	Давење	Протеин-енергетска неухранетост	Леукемија	ХИВ/СИДА	Војна	Давење
10	Менингитис	Повреди во сообраќајни незгоди	Падови	Самонанесени повреди	Леукемија	Давење	Туберкулоза

Графикон 1

Графиконот ги покажува причините за смртност и возраста на починатите лица. Како што може да се заклучи: од болести на срце, болести на мозокот и од карцином смртноста се зголемува како што се зголемува возраста на граѓаните. Црвената линија на графиконот покажува смртност од сообраќајни незгоди и од неа може да се заклучи дека сообраќајните незгоди се водечка причина за смртност за лицата до 25 години, односно сообраќајните незгоди се многу поголема причина за смртност кај младите во споредба со болести на срце, болести на мозокот и карцином.

Други поопширни истражувања направени во САД, во кои се земени и други параметри, како на пример, убиства, самоубиства и други ненамерни повреди, повторно потврдуваат дека сообраќајните незгоди се водечка причина за смртност кај младите.



Графикон 2

3. Најчести причини за сообраќајни незгоди во кои страдаат младите возачи, односно возачите почетници

Според светските искуства и резултатите од истражувањата на релевантни меѓународни организации, најчести причини за сообраќајни незгоди во кои страдаат возачите почетници и младите се:

1. **Возачко неискуство.** Ризикот за предизвикување на сообраќајна незгода е највисок во првата година по добивањето на возачката дозвола. Затоа, и покрај добивањето на возачката дозвола, се препорачува младите возачи, односно возачите почетници, да си обезбедат најмалку 30 до 50 часа надгледувана пракса на возење во текот на најмалку шест месеци од добивањето на возачката дозвола.
2. **Недоволна созреаност и слаб карактер**. Ризикот за предизвикување на сообраќајна незгода се зголемува кога младите возачи (возачите почетници) возат млади сопатници во возилото. Притоа, колку е поголем бројот на сопатници во возилото, толку е поголем и ризикот.

3. **Неискуство во ноќно возење.** Ноќното возење е опасност за сите возачи. Фатални сообраќајни незгоди се случуваат најчесто во вечерните часови, но ризикот е многу поголем за младите и неискусни возачи, односно за возачите почетници. Според ЗБСП, во Република Северна Македонија младите возачи – возачите почетници, не смеат да возат од 23 часот до 5 часот наутро во првите две години по стекнувањето на возачката дозвола без придружба на возрасно лице над 25 години кое поседува возачка дозвола од соодветната категорија и на кое не му е изречена забрана за управување на моторно возило.
4. **Некористење појас**. Основната превенција од смртни случаи во сообраќајни незгоди е користењето на сигурносен појас. Истражувањата покажуваат дека младите возачи, возачите почетници и сопатниците најмалку користат сигурносен појас.
5. **Расеано возење и нефокусираност**. Нефокусираноста, расеаноста, невнимателноста – го зголемуваат ризикот кај секој возач, а особено кај возач почетник, да предизвика сообраќајна незгода. Истражувањата потврдуваат дека младите возачи – возачите почетници најчесто користат мобилен телефон и возат со одвлечено внимание.
6. **Замор**. Младите возачи (возачи почетници), се во голем ризик од поспаност при возење, што е причина за предизвикување на илјадници сообраќајни незгоди секоја година. Младите се најмногу поспани во утринските часови или доцна во ноќта. Затоа, пораката до младите е „Планирајте го своето патување, патувајте подготвени, одморени, правете повеќе паузи и консумирајте повеќе течности додека возите. Никогаш немојте да си поставувате големи цели, не ги преценувајте своите способности и не го потценувајте заморот.“
7. **Несовесно возење.** Истражувањата покажуваат дека кај младите недостасува искуство за правилно расудување и зрелост за да се проценат ризичните ситуации. Младите се повеќе склони кон преземање ризик, помалку држат безбедно растојание помеѓу возилата, неправилно престигнуваат, помалку се стрпливи и помалку се толерантни во сообраќајот.
8. **Брзо возење и алкохол**. Брзината и алкохолот изнудуваат грешки кои најчесто завршуваат со фатални последици. Во Република Северна Македонија, возач почетник не смее да управува со возило со брзина поголема од 60 km/h на јавен пат, односно со брзина поголема од 80 km/h на пат наменет исклучиво за сообраќај на моторни возила, односно со брзина поголема од 100 km/h на автопат.

Возачот почетник кој поседува возачка дозвола од „Б” категорија, не смее да управува со возило чија сила на моторот е поголема од 77 киловати. Толеранцијата, т.е. дозволената количина на алкохол во крвта кај возач почетник е еднаква на нула.

4. Статистика и податоци за безбедноста на децата и младите во Република Северна Македонија

Табела 2. Загинати лица во сообраќајни незгоди по категорија и возраст

(01.01.2020 - 31.12.2020)

УЧЕСНИЦИ ВО СООБРАЌАЈОТ		ЗАГИНАТИ ЛИЦА							
		ВКУПНО	0-14	15-19	20-24	25-40	41-64	65 и повеќе	Не-деф.
ВОЗАЧИ	ВЕЛОСИПЕД	5					1	4	
	ВЕЛОСИПЕД СО ПМ	1					1		
	МОПЕД	4		1		1		2	
	МОТОЦИКЛ ДО 125	4		1		1	1	1	
	МОТОЦИКЛ НАД 125	10		1	3	5	1		
	ОСТАНАТО	1						1	
	ПМВ	34		1	7	7	15	4	
	ТМВ	3			1		1	1	
	ТРАКТОР	6				2	3	1	
	ЧЕТИРИЦИКЛ	1					1		
	ВКУПНО	69	0	4	11	16	24	14	0
ПЕШАЦИ		20	1			3	7	9	
СОПАТНИЦИ		26		3	3	7	9	3	1
ПАТНИЦИ		3	2					1	
ОСТАНАТО		7			2	2	1	1	1
ВКУПНО		125	3	7	16	28	41	28	2

Во 2020 година во Република Северна Македонија, од вкупно 125 загинати лица во сообраќајни незгоди, 26 се на возраст до 24 години или 20.8% од вкупниот број на жртви. Од изнесеното може да се истакне дека во Република Северна Македонија помал е бројот на загинати деца и млади во однос на светскиот просек, меѓутоа битно е да се потенцира дека 2020 година во Република Северна Македонија беше најбезбедна во однос на сите претходни години, односно со најмал број на загинати лица во сообраќајни незгоди.

Во споредба со европскиот просек, учеството на младите возачи во вкупниот број на жртви во сообраќајни незгоди во Република Северна Македонија е пониско, што несомнено се должи на цела низа на превентивни мерки и подигање на свеста преку спроведување на кампањи и настани организирани од страна на Министерството за внатрешни работи и Републичкиот совет за безбедност на сообраќајот на патиштата (РСБСП).

Во споредба со ризикот за возачите почетници, со мало искуство во возење, Република Северна Македонија е рангирана блиску до европскиот просек. Ова ја нагласува потребата за спроведување значителни промени во областа на обуката за здобивање со возачката дозвола, подготовката и тестирањето на новите возачи, како и потребата да се воведат други ефикасни мерки за поддршка на возачите почетници.

Во 2017 година Републичкиот совет за безбедност на сообраќајот на патиштата изработи „Студија за ранливи групи учесници во сообраќајот“, анализирајки ја состојбата во Република Северна Македонија повеќе години наназад, а дел од податоците за сообраќајните незгоди во кои страдаат децата и младите се:

- Во месеците април (19,3%), мај (13,6%) и октомври (12,5%) се случувале најголем број сообраќајни незгоди во кои настрадале деца и младинци. Изненадува релативно малиот број на незгоди од ваков тип во месеците јуни, ноември и декември кога процентот изнесува 3,4% што е за пет пати помал од врвниот месец април. Изненадувањето е бидејќи во овие месеци децата одат на училиште, што значи дека се месеци во кои има поголеми активности.
- Поголем број на незгоди од ваков тип има во средите и петоците (18,2%), а потоа следат понеделниците (15,9%). Четвртоците (9,1%) и саботите (10,2%) се денови со помал број на вакви незгоди.
- Најголем број на незгоди се случуваат во попладневниот врвен период од 14 до 18 часот со просечен број на вакви незгоди во еден час од 8,75. Како втор период со најголем број незгоди од овој тип се појавува вечерниот период од 18 до 22 часот (просечно 4,75 незгоди на час).
- Значајно поголем процент на сообраќајни незгоди со настрадани младинци и деца има на двонасочна улица (44,2%) што е за околу 3,5 пати повеќе од втората локација со највисок процент – раскрсница на која нема семафори (12,5%).
- Кај сите останати локации процентот на ваков тип на сообраќајни незгоди варира релативно малку од зона на стојалиште на јавен градски превоз со 4,5% до раскрсница со семафори со 6,8%. Малку се издвојуваат процентите на сообраќајни незгоди со настрадани младинци и деца во зона на училиште (9,1%) и на булевар (9,1%).
- Најчест предизвикувач на незгоди со настрадани деца и младинци се возачите на автомобили и тоа во 88,6% случаи, а потоа следуваат возачите на моторцикли со 5,7% и др.

ЗАКЛУЧОК

Младите претставуваат ризична и ранлива група на учесници во сообраќајот и согласно тоа сите надлежни институции треба да преземат мерки за подобрување на безбедноста на младите во сообраќајот.

Република Северна Македонија по примерот на државите од Европската унија активно се вклучи во преземањето на стратешки мерки и активности со цел унапредување на безбедноста на сообраќајот на патиштата. Во таа насока, изготвени се два многу важни стратешки документи и тоа: Националната стратегија на Република Македонија за унапредување на безбедноста на сообраќајот на патиштата за периодот 2009-2014 година и Втората Национална стратегија на Република Македонија за унапредување на безбедноста на сообраќајот на патиштата 2015-2020 година.

Целта на Втората национална стратегија за унапредување на безбедноста на сообраќајот на патиштата 2015-2020 беше бројот на жртви во сообраќајни незгоди до 2020 година да се намали и да се приближи до просекот на бројот на жртви на земјите на Европската унија и бројот на жртви – млади возачи да се намали за 30%, бројот на повредени со тешки телесни повреди да се намали за 40%, додека бројот на деца – жртви во сообраќајот да се намали на нула.

Вака дефинираните цели не се остварени и затоа се потребни итни мерки за остварување на целите од стратегијата, но и за унапредување на безбедноста на младите во сообраќајот.

Статистичките податоци потврдуваат дека состојбата на безбедноста во сообраќајот на патиштата во Република Северна Македонија бележи тренд на подобрување, но исто така потврдуваат дека безбедноста на патниот сообраќај не е на потребното и посакувано ниво и не е во согласност со целите и динамиката дефинирани во Втората национална стратегија.

За унапредување на безбедноста на патниот сообраќај, а посебно за унапредување на безбедноста на младите во сообраќајот, неопходно е да се имплементираат итни мерки и тоа:

- зајакнување на сообраќајно превентивното дејствување кај младите, како учесници во сообраќајот, во однос на сите ризик фактори кои ја загрозуваат безбеденоста на сообраќајот на патиштата;
- засилување на сообраќајното образование во рамките на образовниот процес;
- унапредување на процесот на едукација и обука на кандидатите за возачи;
- унапредување на работата на автошколите и испитните центри;
- континуирана едукација на младите и на возачите почетници, како учесници во сообраќајот, и изработка на соодветна стручна литература за оваа група учесници во сообраќајот;
- засилување на контролите од сообраќајната полиција;
- промовирање и поддршка на невладиниот сектор, особено во делот на едукација на младите како учесници во сообраќајот;

- врсничка едукација (peer to peer), младите меѓу себе да дискутираат за важноста од почитување на правилата во сообраќајот;
- мерки за поттикнување на младата популација да размислува во насока на поефикасна безбедност во сообраќајот;
- кампањи за безбедност во сообраќајот во соработка со младите, односно покренување на младински иницијативи за побезбеден сообраќај.

Референци:

1. Прва национална стратегија за унапредување на безбедноста на патниот сообраќај 2009-2014,

2. Втора национална стратегија за унапредување на безбедноста на патниот сообраќај 2015-2020.

3. Студија за ранливи групи на учесници во сообраќајот – РСБСП

4. СЗО – Светска здравствена организација

5. Прирачник за возачи почетници – РСБСП

РЕПУБЛИЧКИ
СОВЕТ ЗА БЕЗБЕДНОСТ
НА СООБРАЌАЈОТ
НА ПАТИШТАТА

MS Gordana Kozhuvarovska[100]

YOUNG AND DRIVERS BEGINNERS - A RISKY AND VULNERABLE GROUP OF TRAFFIC PARTICIPANTS

Abstract

Road traffic is an important segment for the economic prosperity, economic and social development of any country. The future and development of a country cannot be achieved without ensuring safe and flowing traffic.

The number of vehicles, the number of drivers and the intensity of the traffic in Republic of North Macedonia and worldwide is constantly growing, and at the same time, unfortunately, traffic accidents are becoming our everyday life. The global epidemic of victims in traffic accidents that has affected the world in recent years, has not passed the Republic of North Macedonia. The large number of lives lost in traffic accidents is a severe and irreparable social loss. The loss is especially severe and great when it comes to the lost lives of children and young people.

Traffic accidents are one of the leading causes of death in humans, especially young people. Worldwide, according to official statistics, 1.3 million people die each year in traffic accidents, of which about 25% are young people under the age of 29. About 50 million people a year suffer severe bodily injuries, many of them with permanent disability, also as a result of irresponsible participation in traffic.

In the Republic of North Macedonia, an average of 150 people per year lose their lives in traffic accidents, although that number is gradually but surely decreasing in recent years. About 25% of them are young people.

We can not and must not accept this condition of the roads as a cruel and inevitable reality that we can not deal with, but on the contrary - this black statistic further challenges and obliges all of us, as institutions and as individuals, to contribute in the process of improving road traffic safety.

The purpose of this paper is to determine the situation with the safety of young people in traffic, to analyze the reasons and to propose measures for greater safety of young people in traffic.

The purpose of this paper is to determine the situation with the safety of young people in traffic, to analyze the causes for traffic accidents and to propose measures for greater safety of young people in traffic.

Keywords: young people, drivers beginners, safety, traffic accidents, casualties.

[100] Republic Council on Road Traffic Safety in Republic of North Macedonia (RCRTS)

1.INTRODUCTION

Young drivers and drivers beginners are the most vulnerable category of traffic participants, but they also often make mistakes in it. According to the Republic Council on Road Traffic Safety, the mistakes are reckless and unintentional because in many situations they are made for the first time or are not made consciously.

Every young person (candidate for driver) when gets in the car for the first time to learn to drive, is usually very attentive and ready to listen and to follow the advice of the instructor. But once the young person gets a driver's license and a minimum of driving experience, things suddenly change, to the surface comes overconfidence based on a false perception of "great" driving skills. Then the biggest mistakes are made in the traffic, and the epilogue of such behavior is usually fatal.

One of the most dangerous mistakes that young drivers make is fast driving, usually in the late evening or early morning. Driving in dark conditions and reduced visibility brings challenges and dangers. Add to that the fast driving, inexperience and fatigue of the "hard" night, then the threat becomes very serious and worrying. Especially "popular" in the summer are street races in the late evenings when the boulevards and streets are empty and when drivers can "measure their strength".

One of the mistakes that almost no one notices is the **distraction**. One statistic states that 15% of all accidents involving young drivers occurred when there was more than one passenger of the same or approximately the same age in the vehicle other than the driver. The young drivers continue the party with their friends in the vehicle, through the city streets, and the desire to prove themselves in front of the friends leads them to a fatal outcome.

There is almost no young person - a driver who does not know these facts or is not aware of their importance. Everyone knows the facts, the risks and the dangers, but not everyone adheres to them.

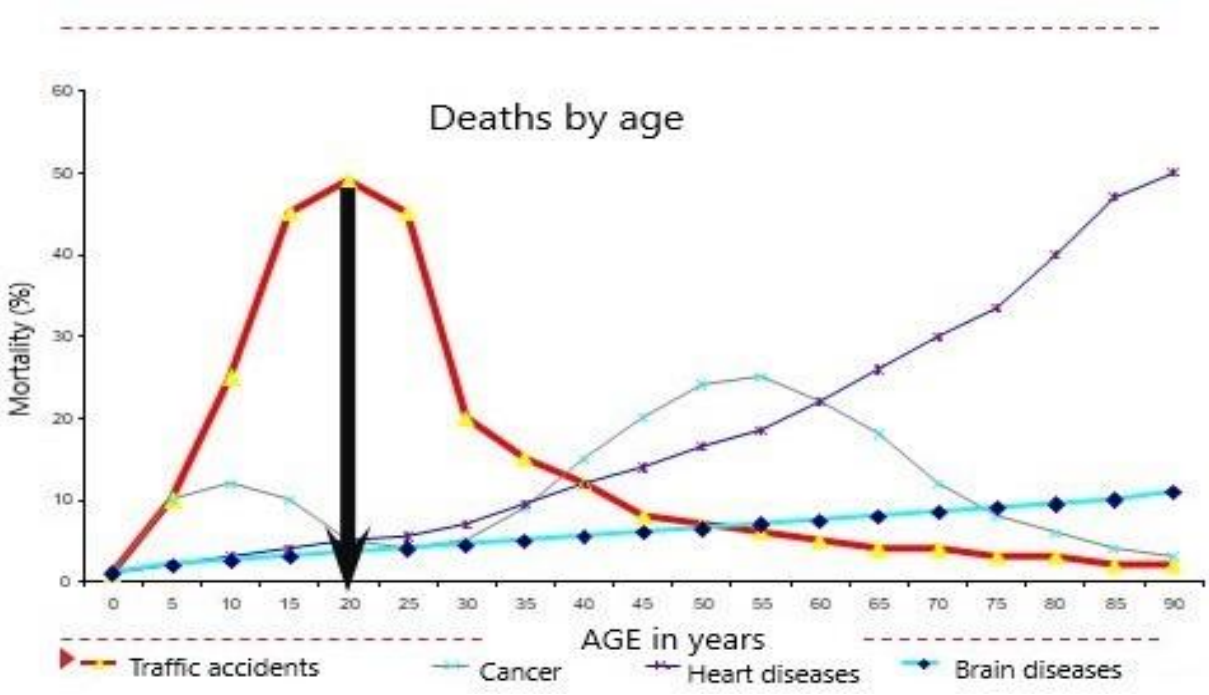
Young drivers and drivers beginners are subject to an increased risk of participating in a traffic accident. Over the past decade there has been an increase in the percentage of young drivers in the total number of fatalities, and people under the age of 20 are still a high-risk group of traffic participants.

2. SECURITY SITUATION FOR YOUNG PEOPLE IN TRAFFIC WORLDWIDE

According to the WHO, every year around 400,000 young people in the world lose their lives in traffic accidents. This means that 1,100 young people under the age of 25 are losing their lives every day in traffic accidents around the world. Traffic accidents are the leading cause of death for people aged 15 to 19, and the second leading cause of death for people aged 10 to 14 and the second leading cause of death for people aged 20 to 24 (Table 1).

Table 1. Causes of traffic accidents and age of participants in traffic accidents

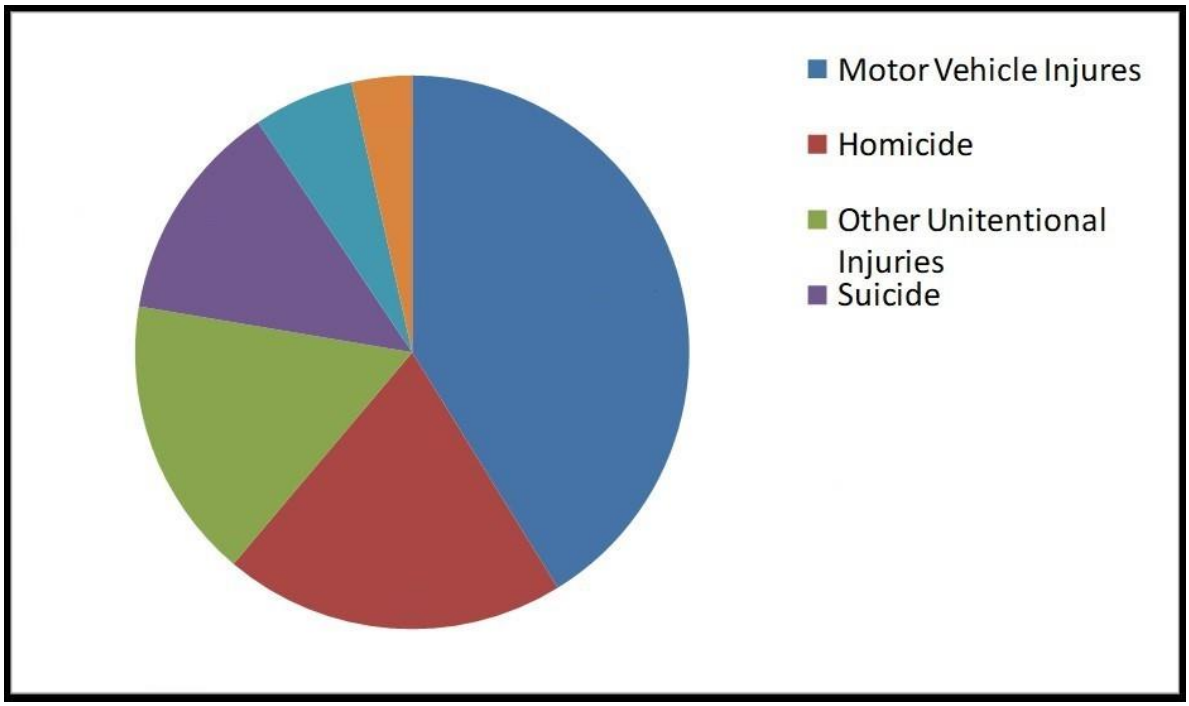
Rank	< 1 year	1 to 4 years	5 to 9 years	10 to 14 years	15 to 19 years	20 to 24 years	All < 25 years
1	Perinatal conditions	Lower respiratory infections	Lower respiratory infections	Lower respiratory infections	Road traffic injuries	HIV/AIDS	Perinatal conditions
2	Diarrhoeal diseases	Childhood cluster diseases	HIV/AIDS	Road traffic injuries	Self-inflicted injuries	Road traffic injuries	Lower respiratory infections
3	Lower respiratory infections	Diarrhoeal diseases	Road traffic injuries	Drowning	Maternal conditions	Self-inflicted injuries	Diarrhoeal diseases
4	Malaria	Malaria	Childhood cluster diseases	HIV/AIDS	Lower respiratory infections	Maternal conditions	Childhood cluster diseases
5	Childhood cluster diseases	HIV/AIDS	Drowning	Tuberculosis	Interpersonal violence	Interpersonal violence	Malaria
6	Congenital anomalies	Perinatal conditions	Meningitis	Protein-energy malnutrition	Drowning	Tuberculosis	HIV/AIDS
7	HIV/AIDS	Protein-energy malnutrition	Fire burns	Fire burns	Tuberculosis	Lower respiratory infections	Congenital anomalies
8	Protein-energy malnutrition	Congenital anomalies	Tuberculosis	Self-inflicted injuries	Fire burns	Fire burns	Road traffic injuries
9	Syphilis	Drowning	Protein-energy malnutrition	Leukaemia	HIV/AIDS	War	Drowning
10	Meningitis	Road traffic injuries	Falls	Interpersonal violence	Leukaemia	Drowning	Tuberculosis



Graph 1

The graph shows the causes of death and the age of the deceased. As can be concluded: from heart disease, brain disease and cancer mortality increases as the age of citizens increases. The red line of the graph shows mortality from traffic accidents and from it it can be concluded that traffic accidents are the leading cause of death for people up to 25 years, ie the traffic accidents are a much higher cause of death among young people compared to heart diseases, brain diseases and cancer.

Other more extensive research in the United States, which take into account other parameters, such as homicides, suicides and other unintentional injuries, reaffirm that traffic accidents are the leading cause of death among young people.



Graph 2

3. THE MOST COMMON REASONS FOR TRAFFIC ACCIDENTS IN WHICH YOUNG DRIVERS (DRIVERS BEGINNERS) SUFFER

According to the worldwide experiences and the results of research by relevant international organizations, the most common causes of traffic accidents in which drivers beginners and young drivers suffer are:

1. Driving inexperience. The risk of causing a traffic accident is highest in the first year after obtaining a driver's license. Therefore, despite obtaining a driver's license, it is recommended that young drivers, ie drivers beginners, provide at least 30 to 50 hours of supervised driving practice during at least six months after obtaining a driver's license.

2. Insufficient maturity and weak character. The risk of causing a traffic accident increases when young drivers (drivers beginners) drive young passengers in the vehicle. The greater the number of passengers in the vehicle, the greater the risk.
3. Inexperience in night driving. Night driving is a danger for all drivers. Fatal traffic accidents usually occur in the evening, but the risk is much higher for young and inexperienced drivers, ie for drivers beginners. According to Law of Road Traffic Safety, in the Republic of North Macedonia, young drivers – drivers beginners, are not allowed to drive from 11 PM to 5 AM in the first two years after obtaining a driver's license unaccompanied by an adult over 25 who holds a driver's license in the appropriate category and who has not been banned from driving a motor vehicle.
4. Not using a seat belt. The basic prevention of deaths in traffic accidents is the use of a seat belt. Research shows that young drivers, drivers beginners and the passengers use the seat belt the least.
5. Distracted driving and lack of focus. Lack of focus, distraction, carelessness - increase the risk of any driver, and especially a driver beginner to cause a car accident. Research confirm that young drivers – drivers beginners often use a mobile phone and drive with distraction.
6. Fatigue. Young drivers (drivers beginners) are at high risk of drowsiness while driving, which causes thousands of traffic accidents each year. Young people are most sleepy in the morning or late at night. Therefore, the message to young people is “Plan your trip, travel prepared, rested, take more breaks and consume more fluids while driving. Never set big goals, do not overestimate your abilities and do not underestimate fatigue."
7. Reckless driving. Research shows that young people lack the experience of proper judgment and maturity to assess risky situations. Young people are more prone to risk-taking, less likely to keep a safe distance between vehicles, overtake incorrectly, they are less patient and less tolerant in the traffic.
8. **Fast driving and alcohol.** The speed and the alcohol extort mistakes that often end in fatality. In the Republic of North Macedonia, a driver beginner must not drive a vehicle with a speed higher than 60 km/h on a public road, ie with a speed higher than 80 km/h on a road intended exclusively for motor vehicle traffic, ie with a speed higher than 100 km/h on a highway.

A driver beginner who holds a "B" category driver's license must not drive a vehicle with an engine power greater than 77 kilowatts. Tolerance, ie. the permissible amount of alcohol in the blood of a driver beginner is equal to zero.

4. STATISTICS AND DATA ON THE SAFETY OF CHILDREN AND YOUNG PEOPLE IN THE REPUBLIC OF NORTH MACEDONIA

Table 2. People killed in traffic accidents by category and age

(01.01.2020 - 31.12.2020)

PARTICIPANTS IN TRAFFIC		PEOPLE KILLED							
		TOTAL	0-14	15-19	20-24	25-40	41-64	65 and more	Unknown
DRIVERS	BIKE	5					1	4	
	BIKE WITH PM	1					1		
	MOPED	4		1		1		2	
	MOTORBIKE TO 125	4		1		1	1	1	
	MOTORBIKE OVER 125	10		1	3	5	1		
	THE REST	1						1	
	PMV	34		1	7	7	15	4	
	TMV	3			1		1	1	
	TRACTOR	6				2	3	1	
	QUADRICYCLE	1					1		
	TOTAL	69	0	4	11	16	24	14	0
PEDESTRIANS		20	1			3	7	9	
FELLOW PASSENGERS		26		3	3	7	9	3	1
PASSENGERS		3	2					1	
THE REST		7			2	2	1	1	1
TOTAL		125	3	7	16	28	41	28	2

In 2020 in the Republic of North Macedonia, out of a total of 125 people killed in traffic accidents, 26 are under the age of 24 or 20.8% of the total number of victims. From the above it can be noted that in the Republic of North Macedonia the number of dead children and young people is lower than the world average, but it is important to emphasize that 2020 was the safest year in the Republic of North Macedonia compared to all previous years, ie with the lowest number of people killed in traffic accidents.

Compared to the European average, the participation of young drivers in the total number of victims in traffic accidents in the Republic of North Macedonia is lower, which is undoubtedly due to a series of preventive measures and awareness raising through campaigns and events organized by the Ministry of Internal Affairs and the Republic Council on Road Traffic Safety (RCRTS).

Compared to the risk for drivers beginners, with little driving experience, the Republic of North Macedonia is ranked close to the European average. This underscores the need for significant changes in the area of driver training, preparation and testing of new drivers, as well as the need to introduce other effective measures to support drivers beginners.

In 2017, the Republic Council on Road Traffic Safety prepared a "Study for vulnerable groups of traffic participants", analyzing the situation in the Republic of North Macedonia for the past several years, and parts of the data on traffic accidents in which children and young people suffer are:

- In the months of April (19.3%), May (13.6%) and October (12.5%) the highest number of traffic accidents occurred in which children and young people were killed. The relatively small number of accidents of this type in June, November and December is surprising, when the percentage is 3.4%, which is five times lower than the peak month of April. The surprise is because in these months the children go to school, which means that they are months in which there are more activities.
- Most accidents of this type occur on Wednesdays and Fridays (18.2%), followed by Mondays (15.9%). Thursdays (9.1%) and Saturdays (10.2%) are days with a smaller number of such accidents.
- The largest number of accidents occur in the afternoon peak period from 2 PM to 6 PM with an average number of such accidents in one hour of 8.75. The second period with the highest number of accidents of this type is the evening period from 6 PM to 10 PM (average 4.75 accidents per hour).
- There is a significantly higher percentage of traffic accidents with young people and children as victims on a two-way street (44.2%), which is about 3.5 times more than the second location with the highest percentage - an intersection with no traffic lights (12.5%).
- In all other locations the percentage of this type of traffic accidents varies relatively little from the stopping area of public transport with 4.5% to the intersection with traffic lights with 6.8%. The percentages of traffic accidents with young people and children in the school zone (9.1%) and on the boulevard (9.1%) are slightly different.
- The most common cause of accidents with injured children and young people are car drivers in 88.6% of cases, followed by motorcyclists with 5.7%.

CONCLUSION

The young people are a risky and vulnerable group of traffic participants and accordingly all competent institutions they should take measures to improve the safety of young people in traffic.

The Republic of North Macedonia, following the example of the European Union countries, has actively participated in undertaking strategic measures and activities in order to improve road traffic safety. In that regard, two very important strategic documents have been prepared, as follows: The National Strategy of the Republic of Macedonia for improving road safety for the period 2009-2014 and the Second National Strategy of the Republic of Macedonia for improving road safety 2015- 2020.

The goal of the Second National Strategy for Improving Road Traffic Safety 2015-2020 was to reduce the number of victims in traffic accidents by 2020 and to approach the average number of victims in European Union countries and the number of victims - young drivers to be reduced by 30%, the number of injured with severe bodily injuries to be reduced by 40%, while the number of children – victims in traffic to be reduced to zero.

The goals defined in this way have not been achieved and therefore urgent measures are needed to achieve the goals of the strategy, but also to improve the safety of young people in the traffic.

The statistical data confirm that the state of road traffic safety in the Republic of North Macedonia is improving, but also confirm that road safety is not at the required and desired level and is not in line with the goals and dynamics defined in the Second National Strategy.

In order to improve road safety, and especially to improve the safety of young people in traffic, it is necessary to implement urgent measures, as follows:

- Strengthening the traffic preventive actions among young people as participants in traffic, in relation to all risk factors that endanger the safety of road traffic;
- Strengthening traffic education within the educational process;
- Improving the process of education and training of candidates for drivers;
- Improving the work of driving schools and examination centers;
- Continuous education of young people and drivers behinners, as participants in traffic, and preparation of appropriate professional literature for this group of participants in traffic;
- Strengthening the controls by the traffic police;
- Promoting and supporting the non-governmental sector, especially in the area of education of young people as participants in traffic;
- Peer education (peer to peer), young people to discuss among themselves the importance of obeying traffic rules;
- Taking measures to encourage the young population to think in the direction of more efficient traffic safety;
- Organizing campaigns for traffic safety in cooperation with the young people, ie launching youth initiatives for safer traffic.

REFERENCES:

1. First National Strategy of the Republic of Macedonia for improving road safety for the period 2009-2014.

2. Second National Strategy of the Republic of Macedonia for improving road safety 2015- 2020.

3. Study for vulnerable groups of traffic participants - RCRTS

4. WHO - World Health Organization

5. Beginner Driver's Guide – RCRTS

Težave pri izobraževanju odraslih na daljavo

Difficulties in teleworking adult education

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POVZETEK

V članku je strnjen prikaz težav, ki so se izpostavile pri izobraževanju odraslih v času epidemije in dela na daljavo. Rezultati so omejeni na vodje izobraževanja odraslih, učitelje in udeležence izobraževanja odraslih. Skupek rezultatov nam poda pregled skupnih težav vseh vpletenih v proces izobraževanja na daljavo. Problematika je aktualna, saj je pogosto obravnavano redno izobraževanje, redkeje pa izobraževanje odraslih, ki se bo v prihodnjih letih še razširilo. Število udeležencev izobraževanja odraslih se namreč povečuje v skladu s politiko vseživljenjskega učenja. Podatki in rezultati članka temeljijo na raziskavah Andragoškega centra Republike Slovenije. Cilj članka je strnjeno osvetliti in prikazati težave, ki nastopajo v procesu izobraževanja odraslih in zavirajo napredek izobraževanja odraslih v procesu izobraževanja odraslih. Z opisom težav se jih lahko zavedamo in jih s skupnimi močmi odpravimo ter omogočimo boljše rezultate na področju izobraževanja odraslih, večje zadovoljstvo učiteljev in udeležencev.

KLJUČNE BESEDE

Izobraževanje odraslih, delo na daljavo,

KEYWORDS

Adult education, adults, teleworking, online adult education

ABSTRACT

The article highlights the problems of online adult education during the epidemic and teleworking. Outcomes are limited to adult education leaders, teachers, and adult education participants. The set of results gives us an overview of the common problems of all those involved in the distance learning process. The issue is important since there has been many articles regarding regular education but not as much describing adult eduction, the number of which is growing steadily. This increase is due to lifelong learning policy. The article is based on the results of the surveys by the Andragogy Center of the Republic of Slovenia. The article aims to summarize the problems that occur in the process of distance learning adult education, which inhibit

the progress of adult. The purpose is also to raise awareness of the problems in order to find solutions and greater satisfaction of teachers and participants in adult education.

1. UVOD

Izobraževanje na daljavo je oblika izobraževanja z dvema temeljnima značilnostma: učitelj in učenec sta med poučevanjem prostorsko ločena, komunikacijo med njima in komunikacijo med učenci samimi pa omogočajo različne vrste tehnologij. Unesco opredeljuje izobraževanje na daljavo kot »vzgojno-izobraževalni proces in sistem, v katerem pomemben delež pouka izvaja nekdo ali nekaj, ki je časovno in prostorsko odmaknjeno od učenca. Pri izobraževanju na daljavo je tehnološka podpora celostno in načrtno integrirana v vse prvine vzgojno-izobraževalnega procesa, vpeta je tako v pedagoško kot administrativno podporo ter učno gradivo, kar omogoča izvajanje učnega procesa ob fizični ločenosti učitelja in učenca [2].

V novejšem času so v porastu hibridne prakse, ki kombinirajo sinhrono in asinhrono komunikacijo med učiteljem in učencem ter med učenci. Te prakse združujejo uporabo elektronske pošte, diskusijske skupine, spletne strani, klepeta, okolja z več uporabniki in spletnega oddajanja. Omogočajo jih različna spletna učna okolja (npr. spletne učilnice Moodle, MS Teams, Zoom) z več prednostmi (nalaganje datotek, forumi, klepeti, integrirani videokonferenčni sistemi itd.). Omejitev teh okolij pa za posameznika predstavlja potencialno preveliko število takšnih okolij in njihovih možnosti [1].

V spletni šoli opravijo udeleženci program v celoti prek spleta, učitelji pa so jim dostopni prek spletnih aplikacij ali telefona. Večina učnih gradiv in usmeritev jim je posredovanih preko spleta (asinhrono) z nekaterimi sinhronimi učnimi urami. Udeleženci se lahko učijo kjer koli in kadar koli, prek računalnika in internetne povezave, nekatere spletne šole pa zahtevajo prisotnost na sinhrono izvajanih učnih urah [1].

Hibridna šola predstavlja temeljni program za svoje udeležence (enako kot spletna šola), značilno zanjo pa je, da ima definirano fizično lokacijo, na kateri so učenci redno prisotni pri pouku, nimajo pa rednega urnika kot tradicionalne šole.

Učenci opravljajo spletne tečaje oz. dostopajo do spletnih vsebin. Dopolnilni in/ali dodatni spletni tečaji obsegajo vso vsebino nekega predmeta, učenci jih lahko opravijo prostorsko in časovno neodvisno, obenem pa obiskujejo klasično šolo. Večina navodil oziroma pouka poteka asinhrono z možnostjo razširitve s sinhronimi učnimi urami. Dopolnilni in/ali dodatni spletni tečaji s spletnim učiteljem (onsite teacher) so raznoliki, razmerje med količino samostojnega dela z gradivi ter interakcije z učiteljem pa močno variira. Učenec dela z učiteljem sam ali v majhni skupini učencev. Digitalne vsebine in programska oprema, ki omogoča trening veščin, so gradiva, ki jih uporabljajo učitelji v tradicionalni šoli kot del rednega pouka ali za učenčevo domače delo. Vsebino oblikuje ponudnik ali učitelj sam, lahko pa učitelj uporablja oboje. Umeščena je na učiteljevo spletno stran, v spletno učno okolje (learning management system – LMS) ali aplikacijo. V našem prostoru je bila uporaba tehnologije za namene poučevanja do prvega vala epidemije raziskovana predvsem kot del pouka v živo [1].

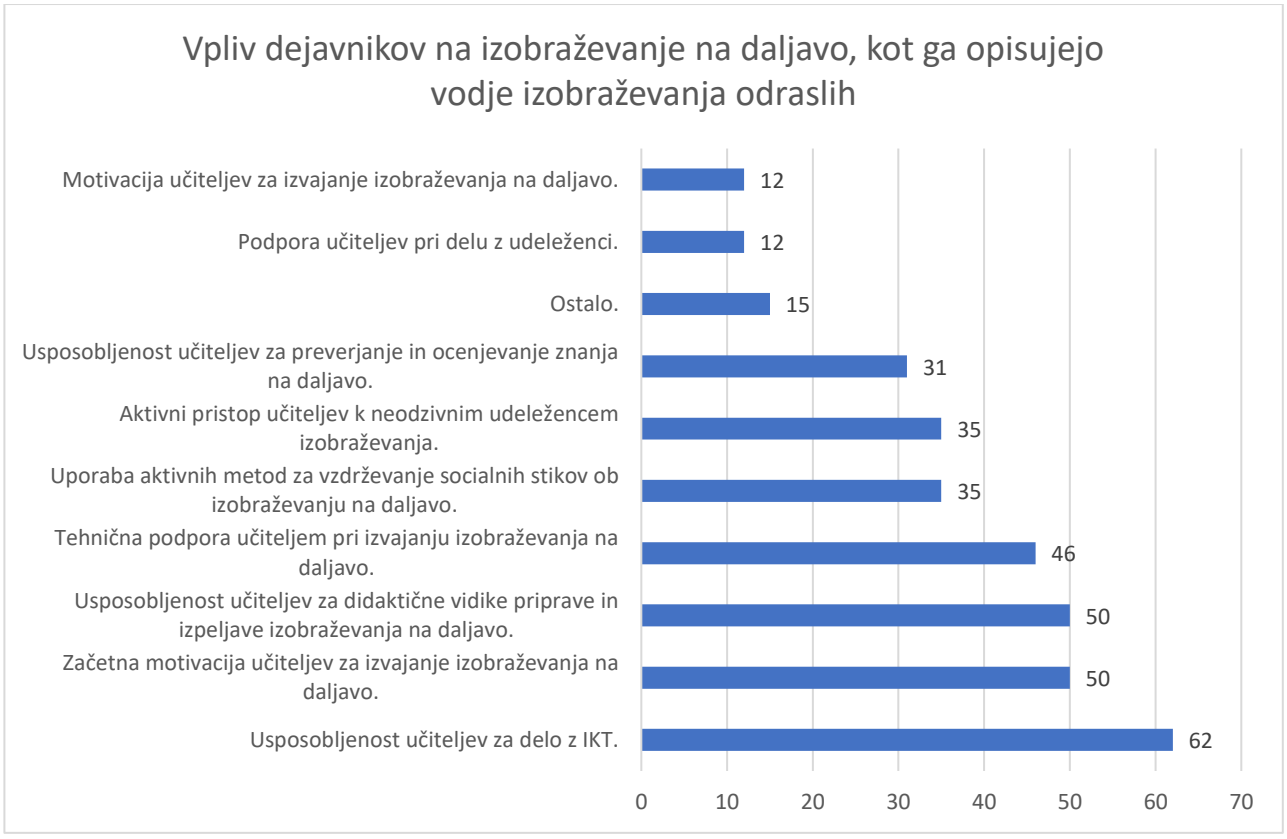
2. REZULTATI

V spletni šoli opravijo učenci ves program v celoti prek spleta, učitelji pa so jim dostopni prek spletnih aplikacij ali telefona. Večina učnih gradiv in usmeritev je učencem posredovana prek spleta (asinhrono) z nekaterimi sinhronimi učnimi urami. Učenci se učijo kjer koli in kadar koli, prek računalnika in internetne povezave. Nekatere spletne šole zahtevajo prisotnost na sinhrono izvajanih učnih urah. Hibridna šola predstavlja temeljni program za svoje učence (enako kot spletna šola), značilno zanjo pa je, da ima definirano fizično lokacijo, na kateri so učenci redno prisotni pri pouku, nimajo pa rednega urnika kot tradicionalne šole. Učenci opravljajo spletne tečaje oz. dostopajo do spletnih vsebin. Dopolnilni in/ali dodatni spletni tečaji obsegajo vso vsebino nekega predmeta, učenci jih lahko opravijo prostorsko in časovno neodvisno, obenem pa obiskujejo klasično šolo. Večina navodil oz. pouka poteka asinhrono z možnostjo razširitve s sinhronimi učnimi urami. Dopolnilni in/ali dodatni spletni tečaji s spletnim učiteljem (onsite teacher) so raznoliki, razmerje med količino samostojnega dela z gradivi ter interakcije z učiteljem pa močno variira. Učenec dela z učiteljem sam ali v majhni skupini učencev. Digitalne vsebine in programska oprema, ki omogoča trening veščin, so gradiva, ki jih uporabljajo učitelji v tradicionalni šoli kot del rednega pouka ali za učenčevo domače delo. Vsebino oblikuje ponudnik ali učitelj sam, lahko pa učitelj uporablja oboje. Umeščena je na učiteljevo spletno stran, v spletno učno okolje (learning management system – LMS) ali aplikacijo. Programska oprema za ocenjevanje znanja in prikaz rezultatov daje možnosti preverjanja in ocenjevanja znanja, največkrat pa jo (v ZDA) uporabljajo na ravni šole ali na nacionalni ravni [1].

V našem prostoru je bila uporaba tehnologije za namene poučevanja do prvega vala epidemije raziskovana predvsem kot del pouka v živo. V svoji razpravi o inovativnih učnih okoljih [3] omenja različna pojmovanja inovativnih učnih okolij in v sklopu pojmovanja inovativnega učnega okolja kot tehnološko podprtega sistema navajata deset kategorij učnih okolij, podprtih z informacijsko komunikacijsko tehnologijo (IKT), po našem mnenju uporabnih tudi pri poučevanju na daljavo:

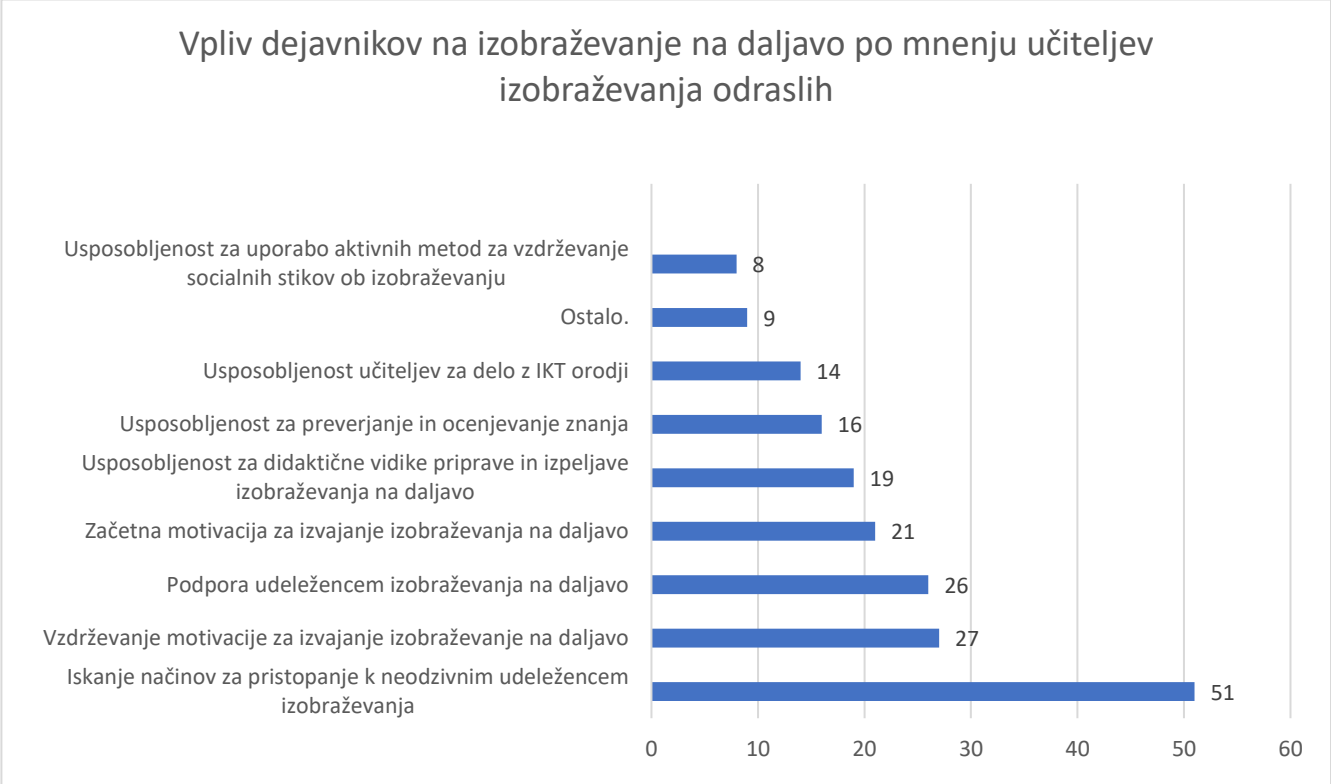
1. usposabljanje s pomočjo računalnika (učna enota, preverjanje in povratna informacija prek računalniškega zaslona, učenec napreduje na naslednjo raven, ko opravi predhodne),
2. multimedia (poučevanje, sestavljeno iz vizualnih delov, npr. ilustracije, videoposnetki, in besedilnih delov, npr. natisnjenih ali govorjenih),
3. interaktivna simulacija (omogočajo nadzor učenca, npr. spreminjanje vhodnih parametrov),
4. hipertekst in hipermedia (učna gradiva, sestavljena iz povezav na klik),
5. inteligentni tutorski sistemi (sistemi, ki učencu prilagajajo učno pot),
6. pridobitev informacij preko uporabe sodobnih e-storitev in zapletov,
7. animirani pedagoški posredniki (liki, ki vodijo učenca skozi učno enoto na računalniku),
8. virtualna okolja s posredniki (vizualno resnična okolja, ki simulirajo interakcije z resničnimi ljudmi in uporabljajo tudi resnični jezik),
9. didaktične igre (igre, ki so namenjene poučevanju),
10. računalniško podprto sodelovalno učenje in projektno delo [3].

V nadaljevanju so prikazani rezultati anket vodij izobraževanja, učiteljev in udeležencev izobraževanja odraslih. V anketah so predstavljeni odgovori, ki po mnenju anketirancev predstavlja oviro pri uspešnem izvajanju izobraževanja odraslih. Anketa je opravljena na manjšem številu anketirancev, ki so izpostavili težave pri delu na daljavo[1]. Iz tega razloga ankete in sklepi temeljijo na osnovi vzorčne skupine anketirancev in ne predstavljajo natančnega stanja, ampak so strnjen prikaz stanja na področju problematike izobraževanja na daljavo izobraževanja odraslih [1].



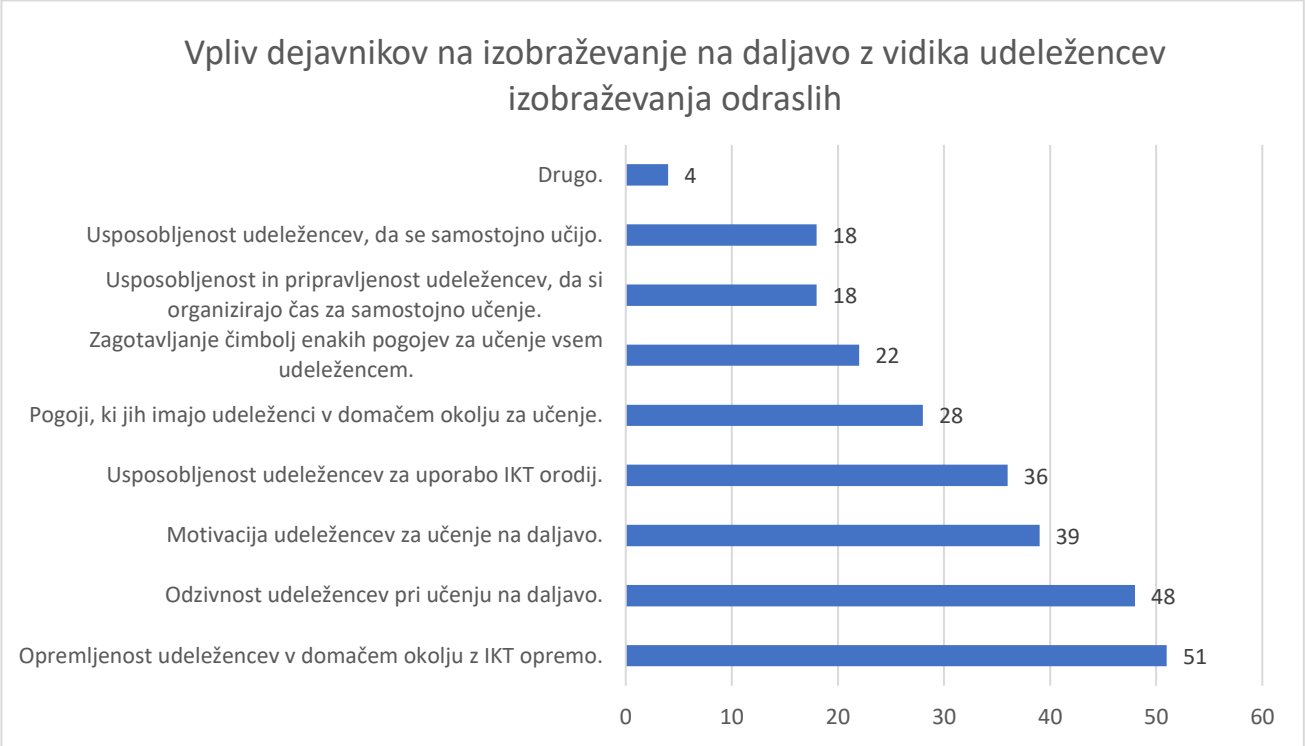
Graf 29: Na grafu je predstavljenih več dejavnikov, ki vplivajo na kakovost izobraževanja na daljavo, stolpci na desni pa prikazujejo njihovo vrednost, kot so jo opisali vodje izobraževanja odraslih. Število ob stolpcu predstavlja odstotek vprašanih, ki so posamezni dejavnik izbrali kot največjo težavo pri delu na daljavo[1].

Na Grafu 1 lahko jasno vidimo, da je največji delež vprašanih kot največjo težavo opisal usposobljenost učiteljev za delo z IKT. Iz tega lahko sklepamo, da moramo posodobiti izobraževanje učiteljev in v sistem vključiti vse sodobne tehnologije za izobraževanje na daljavo, s katerimi so bili soočeni ob pandemiji Covid-19. To velja tako za izobraževanje odraslih kot tudi za ostale učitelje, ki so bili postavljeni pred enak izziv. Ta rešitev bi vključila tudi naslednje tri dejavnike, za katere so anketiranci odločili, da predstavljajo ravno tako pomemben del težav izobraževanja na daljavo in jih v grafu vidimo nad opisanim dejavnikom. Začetna motivacija učiteljev bi bila višja, če jim nove tehnologije ne bi bile tuje in bi v njih videli mnogo možnosti, s katerimi lahko motivirajo sebe in udeležence izobraževanja za učenje. Poleg tega bi izobraževanje izpopolnilo tudi njihovo znanje z didaktičnega vidika in jim nudilo tehnično podporo tudi med letom, ne le v začetku.



Graf 30: Dejavniki, ki najbolj vplivajo na kakovost izobraževanja na daljavo po mnenju učiteljev izobraževanja odraslih [1].

Na Grafu 2 je za razliko od Grafa 1 prikazano mnenje učiteljev izobraževanja odraslih, ki nakazuje, da največja težava ni v sami usposobljenosti ali motivaciji učiteljev, temveč v neodzivnosti udeležencev izobraževanja. Omejitev spletnih orodij in izobraževanja na daljavo je ravno predstavljeni dejavnik, kjer udeleženci, ki se ne vključujejo v spletne aktivnosti nimajo nobenih koristi od njega, niti ga učitelji ne morejo prisiliti v sodelovanje. Ta težava je deloma odgovornost posameznega udeleženca, ki se mora za opravljanje programa aktivno vključevati v vse dogodke programa. Drugi vzrok pa je lahko znanje IKT udeležencev, ki morajo za vključevanje znati uporabljati programe in spletna orodja, ki jih uporabljajo učitelji. Posledično je ključno, da tudi udeležencem izobraževanja zagotovimo ustrezna izobraževanja, znanje in pripomočke, s katerimi se bodo lahko aktivno vključili v program. Tudi naslednji dejavnik, vzdrževanje motivacije za izvajanje izobraževanja je precej odvisen od udeležencev in učiteljev, ter njihovega znanja uporabe orodij, ki bi ga lahko rešili z opisanimi rešitvami.



Graf 31: Mnenje udeležencev izobraževanja odraslih o dejavnikih, ki najbolj vplivajo na kakovost izobraževanja na daljavo [1].

Na grafu 3 pa je prikazano mnenje udeležencev izobraževanja odraslih, ki nakazuje, da je največja težava izobraževanja odraslih opremljenost z IKT opremo v domačem okolju. V situaciji, v kateri smo se znašli, smo se morali vsi zelo hitro prilagoditi, hkrati pa je najpomembneje, da smo si pridobili vse pripomočke za izvajanje izobraževanja na daljavo, kot so ustrezen računalnik, računalniški sistemi in programi ter na primer spletne kamere, slušalke in zvočniki. Pričakovano pa je, da odrasli udeleženci, ki tega do sedaj niso potrebovali tudi niso imeli, velika možnost pa je tudi, da si tega niso mogli priskrbeti iz finančnih ali drugih vzrokov. Zanimivo je, da so tudi udeleženci sami ugotovili, da niso bili dovolj odzivni, da bi bilo izobraževanje kakovostno izvedeno, kar se sklada z ugotovitvijo učiteljev na Grafu 2. Pomembno pa je poudariti, da prvi opisani dejavnik, pomanjkanje pripomočkov, vpliva na vse ostale dejavnike kot so odzivnost in motivacija udeležencev ter njihova usposobljenost za uporabo IKT.

Na grafih 1, 2 in 3 so prikazani nekateri pomembni dejavniki, ki vplivajo na kakovost izvedbe izobraževanja odraslih na daljavo, ki pa se med seboj močno povezujejo. Kot opisano, bi bila enostavna rešitev pripraviti sistem izobraževanja učiteljev in udeležencev izobraževanja, ki bi vključevala sistem spletnih okolij za izvedbo izobraževanja. Najbolj enostavno bi bilo, da bi se javni učni zavodi v Sloveniji poenotili in izbrali en skupen sistem, po katerem bi potekalo izobraževanje na daljavo na več stopnjah, tako v osnovnih kot srednjih šolah in po možnosti na fakultetah ter na izobraževanju odraslih. Poleg tega bi morali udeležencem izobraževanja in učiteljem skozi izobraževanje nuditi tehnično podporo, poleg tega pa udeležencem nuditi tudi pripomočke za izvedbo programa, ki so opisani zgoraj.

3. ZAKLJUČEK

Pri primerjavi vseh treh grafov lahko sklepamo, da pri izobraževalnih institucijah največ težav predstavlja usposobljenost učiteljev in mentorjev za delo z IKT opremo, naslednja šibka točka, je motivacija izvajalcev andragoškega izobraževalnega procesa. Sklepam, da večinoma učitelji in mentorji niso vajeni nenadne spremembe načina poučevanja. Neposredni izvajalci so večino časa izvajali proces v neposrednem stiku z udeleženci izobraževanja odraslih. Metode poučevanja so se za večino zelo močno spremenile v smislu načina poučevanja, uporabljenih pripomočkov in pa občutkov pri načinu podajanja snovi. Pri udeležencih izobraževanja odraslih se srečujemo z s starostno močno različnimi skupinami. Največ težav se izkazuje pri opremljenosti in znanju uporabe IKT opreme. Odzivnost udeležencev izobraževanja je močno odvisna od posameznika. Skupni imenovalec učiteljev in udeležencev izobraževanja je slaba začetna motivacija in vzdrževanje motivacije, ki je posledica sodelovanja preko IKT opreme ne pa v fizičnem stiku in socialnih stikih. Predlog avtorja članka je krepitev didaktičnih kompetenc za izobraževanje na daljavo v smislu izobraževanj. Opremljanje z ustrezno IKT opremo učiteljev in udeležencev izobraževanja odraslih. Poenotenje uporabe spletnih orodij za izobraževanje na daljavo. Glede na hitre spremembe pa lahko ugotovimo, da se z vsakim dnem dela na daljavo razmere izboljšujejo, saj uporabniki pridobivajo izkušnje in znanje glede izobraževanja na daljavo.

PREGLED LITERATURE

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[3] [3], A., (2019). Vloga tehnologije v inovativnih učnih okoljih. Zavod Antona Martina Slomška Mreža znanja 2019

Difficulties in teleworking adult education

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ABSTRACT

The article highlights the problems of online adult education during the epidemic and teleworking. Outcomes are limited to adult education leaders, teachers, and adult education participants. The set of results gives us an overview of the common problems of all those involved in the distance learning process. The issue is important since there has been many articles regarding regular education but not as much describing adult eduction, the number of which is growing steadily. This increase is due to lifelong learning policy. The article is based on the results of the surveys by the Andragogy Center of the Republic of Slovenia. The article aims to summarize the problems that occur in the process of distance learning adult education, which inhibit the progress of adult. The purpose is also to raise awareness of the problems in order to find solutions and greater satisfaction of teachers and participants in adult education.

KEYWORDS

Adult education, adults, teleworking, online adult education

1. INTRODUCTION

Distance education is a form of education with two basic characteristics: the teacher and the student are spatially separated during teaching, and communication between them and communication between the students themselves are enabled by different types of technologies. UNESCO defines distance education as "an educational process and system in which a significant proportion of lessons are conducted by someone or something who is temporally and spatially distant from the student. In distance education, technological support is integrated and systematically integrated into all elements of the educational process, it is included in both pedagogical and administrative support and teaching materials, which enables the implementation of the learning process with physical separation of teacher and student [2]. In recent times, hybrid practices that combine synchronous and asynchronous communication between teacher and student and between students are on the rise. These practices combine the use of email, newsgroup, website, chat, multi-user environment, and webcasting. They are enabled by various online learning environments (eg online

classrooms Moodle, MS Teams, Zoom) with several advantages (file uploads, forums, chats, integrated video conferencing systems, etc.). The limitation of these environments, however, represents a potentially excessive number of such environments and their possibilities for the individual [1]. In the online school, participants complete the program entirely online, and teachers are available to them via online applications or by phone. Most learning materials and guidelines are provided to them online (asynchronously) with some synchronous lessons. Participants can learn anywhere and anytime, via computer and internet connection, and some online schools require attendance at synchronously conducted lessons [1]. A hybrid school is a basic program for its participants (the same as an online school), and it is characterized by a defined physical location where students are regularly present in class, but do not have a regular schedule like a traditional school. Students take online courses or. access online content. Complementary and / or additional online courses cover the entire content of a subject, students can take them spatially and temporally independently, and at the same time attend a classical school. Most instructions or lessons take place asynchronously with the possibility of extension with synchronous lessons. Complementary and / or additional online courses with an onsite teacher are diverse, and the relationship between the amount of independent work with materials and interactions with the teacher varies greatly. The student works with the teacher alone or in a small group of students. Digital content and skills training software are materials used by teachers in a traditional school as part of regular classes or for a student’s homework. The content is designed by the provider or the teacher himself, but the teacher can use both. It is placed on the teacher's website, in the online learning environment (learning management system - LMS) or application. In our area, the use of technology for teaching purposes up to the first wave of the epidemic has been explored primarily as part of live instruction [1].

2. RESULTS

In the online school, students complete the entire program online, and teachers are available to them via online applications or by phone. Most learning materials and guidelines are delivered to students online (asynchronously) with some synchronous lessons. Students learn anywhere, anytime, via computer and internet connection. Some online schools require attendance at synchronously conducted lessons. A hybrid school is a basic program for its students (the same as an online school), and it is characterized by having a defined physical location where students are regularly present in class, but do not have a regular schedule like a traditional school. Students take online courses or. access online content. Complementary and / or additional online courses cover the entire content of a subject, students can take them spatially and temporally independently, and at the same time attend a classical school. Most instructions or. lessons are held asynchronously with the possibility of extension with synchronous lessons. Complementary and / or additional online courses with an onsite teacher are diverse, and the relationship between the amount of independent work with materials and interactions with the teacher varies greatly. The student works with the teacher alone or in a small group of students. Digital content and skills training software are materials used by teachers in a traditional school as part of regular classes or for a student’s homework. The content is designed by the provider or the teacher himself, but the teacher can use both. It is placed on the teacher's website, in the online learning environment (learning management system - LMS) or application.

Knowledge assessment and display software provides testing and assessment options and is most commonly used (in the US) at school or national level [1]. In our area, the use of technology for teaching purposes until the first wave of the epidemic was explored primarily as part of live instruction. In its discussion on innovative learning environments [3], it mentions different notions of innovative learning environments and, as part of the notion of innovative learning environments as a technologically supported system, lists ten categories of learning environments supported by information communication technology (ICT). distance:

1. computer-assisted training (learning unit, checking and feedback via computer screen, the student advances to the next level after completing the previous ones),

2. multimedia (teaching consisting of visual parts, eg illustrations, videos, and textual parts, eg printed or spoken),

3. interactive simulation (enable control of the student, eg changing input parameters),

4. hypertext and hypermedia (learning materials consisting of click-through links),

5. intelligent tutoring systems (systems that adapt the learning path to the student),

6. obtaining information through the use of modern e-services and complications,

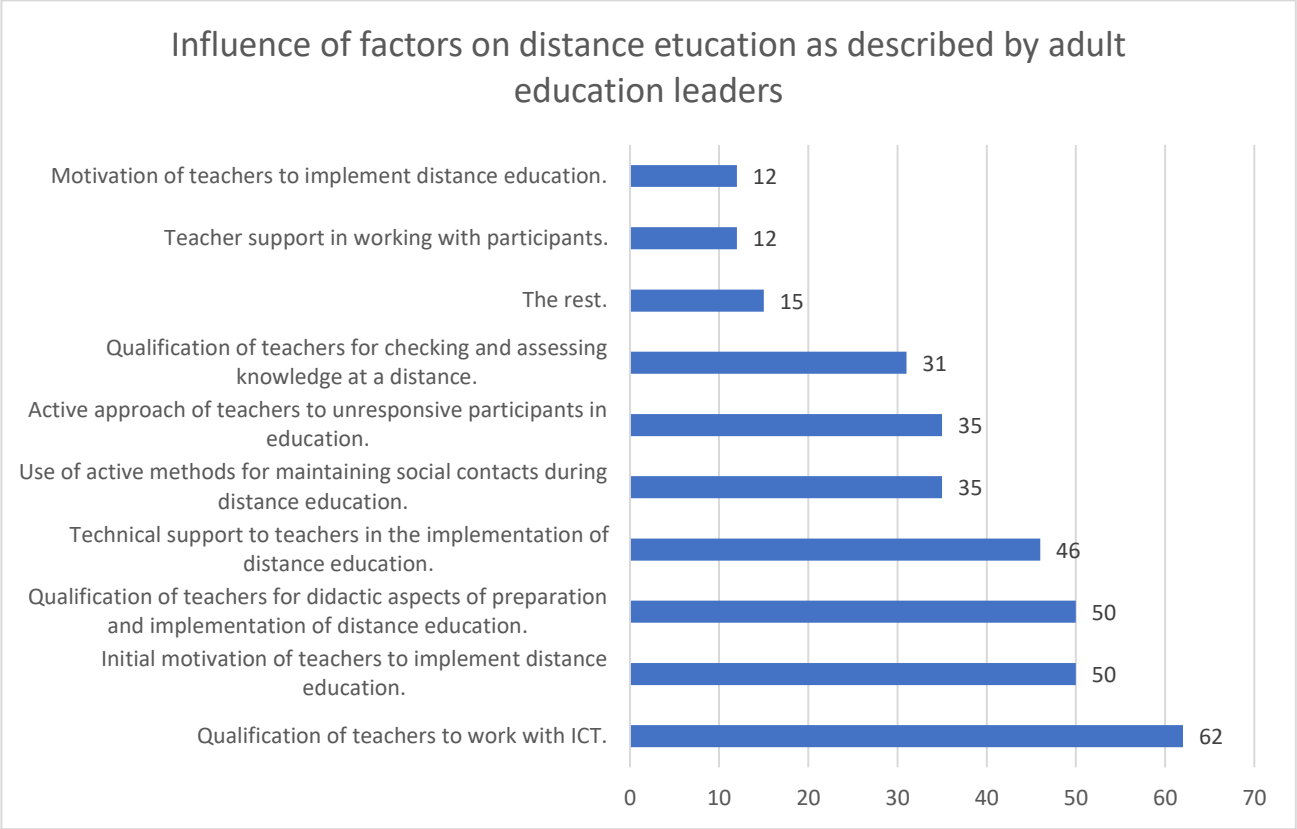
7. animated pedagogical mediators (characters who guide the student through the learning unit on the computer),

8. virtual environments with intermediaries (visually real environments that simulate interactions with real people and also use real language),

9. didactic games (games intended for teaching),

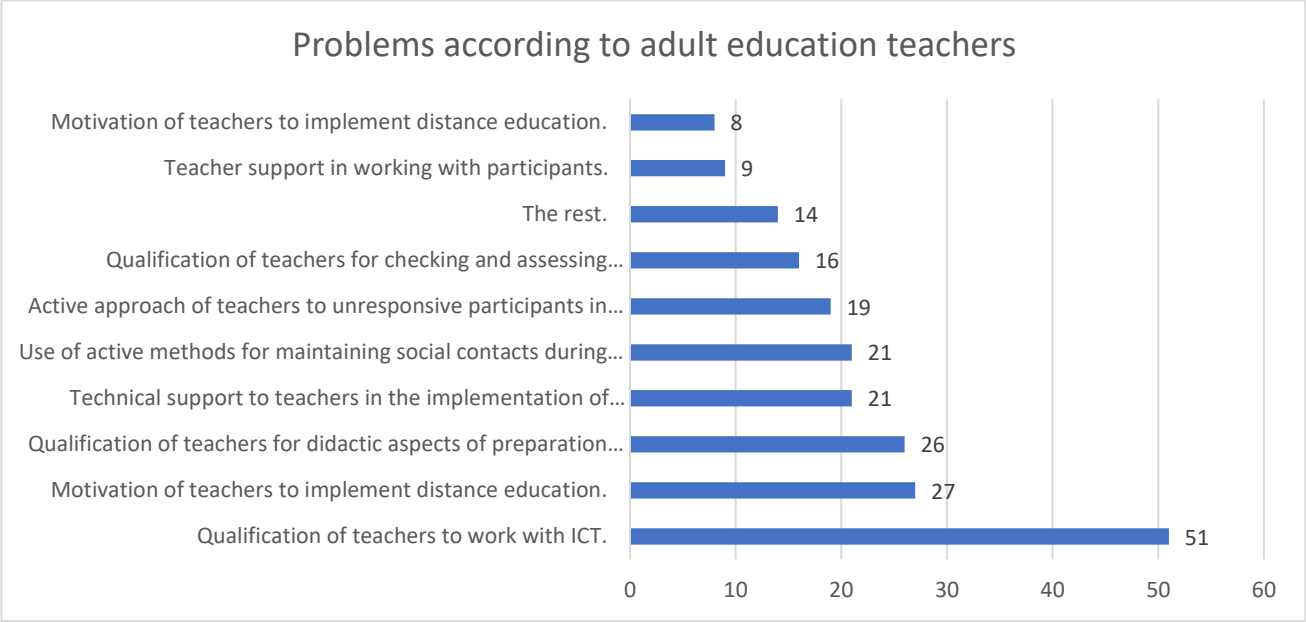
10. computer-assisted collaborative learning and project work [3].

The results of surveys heads of adult education, teachers and participants in adult education are presented below. The answers are presented in the surveys, which, according to the respondents, represent an obstacle to the successful implementation of adult education. The survey was conducted on a small number of respondents who pointed out the difficulties in working remotely [1]. For this reason, the surveys and conclusions are based on a sample group of respondents and do not represent an exact situation, but are a concise presentation of the situation in the field of distance education for adults [1].



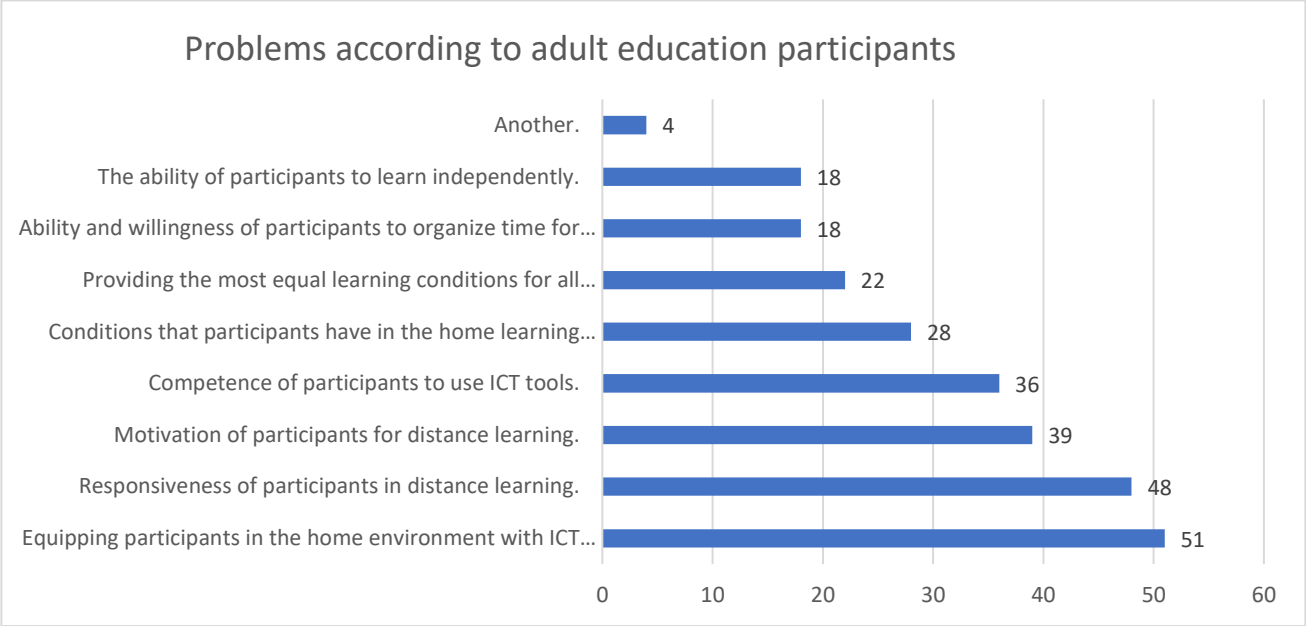
Graf 1: The graph presents several factors that affect the quality of distance education, and the columns on the right show their value as described by adult education leaders. The number next to the column represents the percentage of respondents who chose each factor as the biggest problem in teleworking [1].

In Graph 1, we can see that the largest share of respondents described the ability of teachers to work with ICT as the biggest problem. From this, we can conclude that we need to modernize teacher education and incorporate into the system all the modern distance education technologies they faced during the Covid-19 pandemic. This applies to adult education as well as to other teachers who have been faced with the same challenge. This solution would also include the following three factors, which the respondents decided to represent an equally important part of the problems of distance education and we see them in the graph above the described factor. The initial motivation of teachers would be higher if new technologies were not foreign to them and they saw in them many opportunities with which they can motivate themselves and participants in learning to learn. In addition, the training would also improve their knowledge from a didactic point of view and provide them with technical support during the year, not only at the beginning.



Graf 32:Factors most influencing the quality of distance education according to adult education teachers [1].

Graph 2, in contrast to Graph 1, shows the opinion of adult education teachers, which indicates that the biggest problem is not in the qualifications or motivation of teachers themselves, but in the unresponsiveness of education participants. The limitation of online tools and distance learning is just a presented factor where participants who do not engage in online activities do not benefit from it, nor can teachers force them to participate. This problem is partly the responsibility of the individual participant, who must be actively involved in all program events in order to carry out the program. Another reason may be the knowledge of ICT participants, who must be able to use the programs and online tools used by teachers to integrate. Consequently, it is crucial that we also provide the participants with the appropriate training, knowledge and tools with which they will be able to actively participate in the program. Also the next factor, maintaining the motivation to implement education depends a lot on the participants and teachers, and their knowledge of the use of tools, which could be solved with the described solutions.



Graph 3: Opinion of adult education participants on the factors that most influence the quality of distance education [1].

Graph 3 shows the opinion of the participants in adult education, which indicates that the biggest problem of adult education is the equipment with ICT equipment in the home environment. In the situation we found ourselves in, we all had to adapt very quickly, but most importantly, we acquired all the tools for conducting distance education, such as a suitable computer, computer systems and programs, such as webcams, headphones and speakers. It is expected, however, that adult participants who did not need it so far did not have it, and there is a high possibility that they could not get it for financial or other reasons. Interestingly, the participants themselves found that they were not responsive enough to provide quality education, which is in line with the teachers' finding in Graph 2. It is important to note that the first described factor, lack of tools, affects all others. factors such as the responsiveness and motivation of participants and their ability to use ICT. Graphs 1, 2 and 3 show some important factors that affect the quality of the implementation of adult education at a distance, but which are strongly interconnected. As described, a simple solution would be to prepare a system of education of teachers and participants in education, which would include a system of online environments for the implementation of education. It would be easiest for unified public educational institutions in Slovenia to unify and choose one common system, according to which distance education would take place at several levels, both in primary and secondary schools and, if possible, at faculties and adult education. In addition, technical support should be provided to training participants and teachers through training, as well as the tools for implementing the program described above.

3. CONCLUSION

Comparing all three graphs, we can conclude that the most difficult problems for educational institutions are the ability of teachers and mentors to work with ICT equipment, the next weak point is the motivation of providers of the andragogical educational process. I conclude that for the most part, teachers and mentors are not accustomed to a sudden change in the way they teach. Direct providers spent most of the time conducting the process in direct contact with adult education participants. Teaching methods have changed greatly for most in terms of the way they teach, the tools used, and the feelings in the way they teach the material. Among the participants in adult education, we encounter very different age groups. Most problems are shown in the equipment and knowledge of the use of ICT equipment. The responsiveness of education participants is highly dependent on the individual. The common denominator of teachers and participants in education is poor initial motivation and maintenance of motivation, which is the result of cooperation through ICT equipment and not in physical contact and social contacts. The proposal of the author of the article is to strengthen didactic competencies for distance education in terms of education. Equipping teachers and participants in adult education with appropriate ICT equipment. Unification of the use of online tools for distance education. However, given the rapid changes, we can see that the situation is improving with each day of distance work, as users gain experience and knowledge regarding distance education.

LITERATURE REVIEW

[1] Možina, T., Radovan, M. in Klemenčič, S. (2020). Izkušnje z izobraževanjem odraslih na daljavo v času pandemije. Andragoški center Slovenije, Ljubljana 2020

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VARNA MOBILNOST DIJAKOV SREDNJE PROMETNE ŠOLE MARIBOR

Povzetek:

V prispevku smo predstavili podlage, aktivnosti in cilje na področju varne mobilnosti udeležencev v cestnem prometu, ki je podrobno opredeljena v Resoluciji nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022. Še posebej smo se osredotočili na populacijo dijakov, ki so vključeni v srednješolski izobraževalni sistem, in vsebine s področja prometne varnosti, s katerimi bi morali biti seznanjeni. Kot šola smo dolžni in zavezani k ozaveščanju dijakov o pomenu prometne varnosti, še zlasti pa kot šola, ki izobražujemo na področju prometa in logistike. Te vsebine poskušamo približati dijakom in širši v okolici prek različnih predmetnih področij, še posebej pa skozi obšolske dejavnosti, kjer nastopamo kot organizatorji in sodelujoči pri različnih projektih in prireditvah šole ter lokalne skupnosti.

Ključne besede: prometna varnost, varna mobilnost, prometna vzgoja, AVP, SPV

Summary:

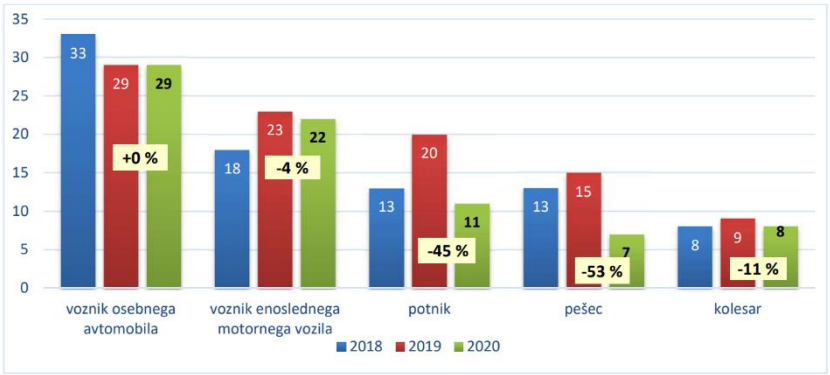
In this paper, we presented the bases, activities and goals in the field of safe mobility of road users, which is detailed in the Resolution of the National Road Safety Program for the period from 2013 to 2022. We especially focused on the population of students involved in secondary school education system and road

safety content that they should be familiar with. As a school, we are obliged and committed to raising students' awareness of the importance of traffic safety, and especially as a school that educates in the field of transport and logistics. We try to bring these contents closer to students and the wider environment through various subject areas, especially through extracurricular activities, where we act as organizers and participants in various projects and events of the school and the local community.

Keywords: traffic safety, safe mobility, traffic education, AVP, SPV

UVOD

Varno na cesti ali varna mobilnost je zadnja leta pobuda različnih preventivnih akcij po Sloveniji pod okriljem Javne agencije Republike Slovenije za varnost prometa (v nadaljevanju AVP).
Danes nam mobilnost omogoča potovanja zaradi lastnih potreb po doseganju ciljev potovanj. Načini potovanja so se spremenili oziroma motorizirali – uporaba avtomobila ali javnega potniškega prometa. Zato je varnost v cestnem prometu postala pomembno družbeno vprašanje. Na osnovi napotkov v Evropski uniji in nacionalnih interesov se je pripravila Resolucija o nacionalnem programu varnosti cestnega prometa za obdobje od 2013 do 2022. (Resolucija nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022)
Žal se v prometu dogajajo stvari, ki si jih ne želimo. Prometne nesreče so posledice akterjev v prometu: vozila, prometne površine in udeležencev v prometu. Ker je vožnja avtomobila danes dostopna skoraj vsem, se je težko osredotočiti na krivca večine nesreč. Zato imajo prometne nesreče mnogo negativnih posledic, saj povzročajo izgubo virov, človeških življenj in blaginje. Graf 1 prikazuje umrle na slovenskih cestah v obdobju od 2018 do 2020.



Graf 2: Umrli udeleženci v prometnih nesrečah po vrsti udeleženca v obdobju 2018–2020

Vir: https://www.avp-rs.si/wp-content/uploads/2021/03/analiza-in-pregled-stanja-varnosti-cestnega-prometa-v-letu-2020.pdf (pridobljeno 31. 5. 2021)

Iz grafa 1 je na prvi pogled razvidno občutno zmanjšanje števila umrlih udeležencev v prometnih nesrečah. Vendar je kljub občutnemu zmanjšanju obsega prometa, zaradi ukrepov za zajezitev epidemije v skupini voznikov osebnega avtomobila, število umrlih ostalo na enaki ravni kot leto prej.

RESOLUCIJA NACIONALNEGA PROGRAMA VARNOSTI CESTNEGA PROMETA ZA OBDOBJE OD 2013 DO 2022

Nacionalni program varnosti cestnega prometa sledi tudi drugim načelom, ki omogočajo učinkovitost in uresničljivost nacionalnega programa prometne varnosti.
Ta načela so:

- družbena podpora,
- uresničljivost,
- prožnost/pragmatičnost,
- pravočasnost/ustreznost,
- usklajenost ravni opazovanja (mednarodno/nacionalno/lokalno),
- racionalnost/optimalnost/učinkovitost,
- preglednost/sledljivost/primerljivost,
- odgovornost,
- sistematičnost,
- merljivost in druga načela.

Slika 33: Načela varnosti cestnega prometa

Vir: Prirejeno po: Resolucija nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022. (31. 5. 2021)

Strategija nacionalnega programa zagotavlja načrtno približevanje zastavljenim ciljem in njihovo doseganje. Ustvarja podlago za skupno načrtovanje, izvajanje nacionalnega programa in vključitev vseh možnih dejavnosti in subjektov, ki so dolžni ali želijo kakor koli prispevati k varnosti v cestnem prometu.
Področje izobraževanja v Republiki Sloveniji je v resoluciji posebej navedeno kot zelo pomembno področje, ki mora prispevati k ciljem izboljšanja prometne varnosti. Varnost v cestnem prometu je tako pomemben del delovanja družbe, v veljavnih učnih načrtih pa so vključene prometne vsebine po vertikali, od predšolske vzgoje, osnovnošolskega izobraževanja do srednješolskega izobraževanja. Prometna vzgoja in vseživljenjsko učenje prispevata k oblikovanju ustreznih stališč do posameznih dejavnikov varnosti in k ustreznemu vedenju v prometu. Pogoj za oblikovanje ustreznih stališč in varnega vedenja sta pridobivanje in stalno obnavljanje znanj in spretnosti za varno sodelovanje v prometu.
Prometna vzgoja in vseživljenjsko učenje za varno sodelovanje v prometu potekata v več življenjskih obdobjih, ki bistveno vplivajo na organiziranost, vsebine in oblike dela:

- prvo življenjsko obdobje (nosečnost in prvo leto življenja),
- prometna vzgoja v predšolskem obdobju,
- prometna vzgoja v obdobju izobraževanja v osnovni šoli,

- varnost v obdobju poklicnega in srednješolskega izobraževanja,
- usposabljanje za vožnjo motornih vozil,
- vseživljenjsko učenje za varno sodelovanje v prometu.

V tabeli 1 so opredeljena življenjska obdobja in vloga prometne vzgoje, ki jih ima le-ta na udeležence. Določeni so tudi nosilci, ki so dolžni izvajati posamezne dejavnosti za povečanje prometne varnosti vseh udeležencev v prometu v vseh starostnih obdobjih.

Tabela 1: Vloga prometne vzgoje v življenjskih obdobjih in odgovorni nosilci prometne vzgoje

ŽIVLJENJSKO OBDOBJE	VLOGA	NOSILEC DEJAVNOSTI
PRVO ŽIVLJENJSKO OBDOBJE	Otrok v prvem življenjskem obdobju je v prometu udeležen in ogrožen predvsem v vlogi potnika (ključni so starši).	AVP, šole za starše, izvajalci zdravstvenega varstva otrok na primarni ravni
PROMETNA VZGOJA V PREDŠOLSKEM OBDOBJU	Otrok v prvem življenjskem obdobju je v prometu udeležen in ogrožen predvsem v vlogi potnika (ključni so starši).	AVP, šole za starše, izvajalci zdravstvenega varstva otrok na primarni ravni
PROMETNA VZGOJA V OBDOBJU IZOBRAŽEVANJA V OSNOVNI ŠOLI	PRVO TRILETJE (OD 6 DO 8 LET) Učenci so v prometu udeleženi predvsem kot potniki in pešci, zato so vsebine prometne vzgoje usmerjene predvsem v znanja in spretnosti, ki jih mora obvladati otrok za varno sodelovanje v prometu v vlogi pešca, potnika v osebnem avtomobilu in v vozilih javnega prevoza, pripravljati pa se mora na samostojno kolesarjenje. DRUGO TRILETJE (OD 9 DO 11 LET) Prometna vzgoja za to starostno skupino je usmerjena predvsem v pripravo in izvedbo programa usposabljanja učencev za vožnjo kolesa. TRETJE TRILETJE (OD 12 DO 14 LET) Otroci v tem starostnem obdobju sodelujejo v prometu v vseh vlogah. So pešci, potniki, kolesarji in pogosto tudi vozniki vozil, ki jih glede na svojo starost še ne bi smeli voziti. To je starostno obdobje, v katerem bi morali pozornost posvetiti predvsem obnavljanju in ohranjanju znanj in varnega vedenja ter spodbujati usvajanje moralnih norm, pomembnih za varno sodelovanje v prometu.	AVP, ministrstvo, pristojno za izobraževanje, znanost in šport, osnovne šole, NVO, občinski sveti za preventivo in vzgojo v cestnem prometu
VARNOST V OBDOBJU POKLICNEGA IN	Javne šole in šole za voznike morajo zagotavljati, da mladostniki pridobijo novo znanje in spretnosti, ter vplivajo na spreminjanje stališča in vedenja do šibkejših	osnovne, srednje in poklicne šole ter

SREDNJEŠOLSKEGA IZOBRAŽEVANJA (OD 15 DO 24 LET)	udeležencev v prometu, do alkohola, hitrosti, varnostnega pasu in drugih pomembnih dejavnikov varnosti.	gimnazije po Sloveniji, avtošole, AVP, NVO
VSEŽIVLJENJSKO UČENJE ZA VARNO SODELOVANJE V PROMETU	Za varno sodelovanje v prometu sta zato nujna vseživljenjsko učenje in ohranjanje vozniških spretnosti.	AVP

Vir: Prirejeno po: Resolucija nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022. (31. 5. 2021)

Iz Resolucije nacionalnega programa varnosti cestnega prometa za obdobje od 2013 do 2022 izhaja, da je na državni ravni poskrbljeno za prometno vzgojo. Natančno so določeni dejavnosti, ukrepi in vloge nosilcev prometne vzgoje. To za nas kot srednjo šolo pomeni, da smo po resoluciji zavezani, da prispevamo svoj del k boljši vzgoji in ozaveščenosti udeležencev v prometu za starostno skupino od 15. do 19. leta, kar je v tabeli 1 označeno z rdečo barvo.

PROMETNA VARNOST NA PROMETNI ŠOLI MARIBOR

Resolucija o nacionalnem programu varnosti cestnega prometa za srednje šole predvideva določena znanja oziroma kompetence, ki naj bi jih dijaki v tem obdobju obravnavali:

- dijaki pojasnijo prometno varnost;
- razvoj prometnih komunikacijskih sredstev;
- predvidevajo nevarnosti v prometu in spoznavajo osnove fizikalnih vsebin (pot, hitrost, pospešek, trenje, trk);
- ovrednotijo promet za varovanje zdravja in za varovanje okolja;
- v tujih jezikih se učijo prometna pravila in pomen prometnih znakov;
- učijo se varnosti v prometu, prometne psihologije, etike v prometu;
- upravljanja različnih strojev.

Pri tujem jeziku pišejo prometna obvestila o prometni varnosti, o orientaciji v prometnem prostoru, pri čemer upoštevajo navodila in prepovedi (uporaba javnih prevoznih sredstev, razvijanje osebne odgovornosti, vzgoja za pravilno ravnanje dijaka kot udeleženca v prometu). Pojasnijo razvoj prometnih in komunikacijskih sredstev, ocenijo pomen prometnih in komunikacijskih sredstev za vse večjo povezanost sveta, predvidevajo nevarnosti v prometu. Vrednotijo prometno lego Slovenije v Evropi; s prometnim zemljevidom Evrope spoznavajo prometno omrežje v Sloveniji (ceste, železnice, letališča, pristanišča) in vrednotijo njegov pomen za posamezna območja v Sloveniji, ocenijo pomen prometa za razvoj gospodarstva, ocenijo ogroženost okolja zaradi cestnega prometa (razvoj infrastrukture, širjenje naselij, onesnaževanje zraka in voda zaradi prometa in odplak), na terenu štejejo promet v okolici šole in pripravijo poročilo s predlogi izboljšav sedanjega stanja.
Analizirajo obstoječo prometno strukturo različnih mest in načrtujejo spremembe, seznanjajo se z oblikami obstoječe prometne ureditve, analizirajo stanje v prometu, iščejo alternativne rešitve za izboljšanje situacije prometne ureditve v konkretnih svetovnih mestih, predstavijo analizo prometa in predlog sprememb v

svojem kraju. Seznanijo se z vsebinami: mirujoči promet, motorni promet, javni promet, kolesarski promet, peš cone in alternativne rešitve javnega prometa (izpusti toplogrednih plinov – globalno ogrevanje).
Spoznavajo zgodovino vsakdanjega življenja: promet, ceste, popotniki, seznanijo se z zgodovino prometa (prometne povezave in trgovanje). Analizirajo vpliv izumov na razvoj posameznih vrst prometa, v okviru izbirnih vsebin se seznanijo s poznavanjem prometnih predpisov (CPP).
Prometna šola Maribor svojim dijakom in študentom v svojem letnem delovnem načrtu omogoči sodelovanje pri preventivni vzgoji prometne varnosti. Poleg vseh aktivnosti, ki jih izvajamo v okviru različnih dejavnosti, imajo izobraževalni programi s področja logistike že v osnovnem kurikulu veliko vsebin, ki prispevajo k večji ozaveščenosti in poznavanju področja prometne varnosti.
Poleg rednega izobraževalnega dela se na šoli vsako leto v maju izvede dogodek Dan prometne varnosti, kjer so vključeni različni izvajalci, kot so policija, mestno redarstvo, različna društva in zavodi, ki skrbijo za preventivo in vzgojo v cestnem prometu. Organizacijo izvedbe dogodka je prevzela Višja prometna šola Maribor, ki poskrbi, da se predavanja in predstavitve omogočijo za vse dijake in študente šole ter tudi za vse druge zainteresirane skupine.
Kot šola smo tudi zelo vključeni v lokalno okolje, kjer zelo dobro sodelujemo v preventivnih akcijah Sveta za preventivo in vzgojo v cestnem prometu Mestne občine Maribor. Z dijaki tretjih letnikov in dijaki prometnega krožka aktivno sodelujemo na raznih prireditvah, še posebej pa se radi družimo z izkušenimi prostovoljci Zveze šoferjev in avtomehanikov ter Sveta za preventivo in vzgojo v cestnem prometu. Med drugim vsako leto sodelujemo na naslednjih dogodkih:

- zaključna prireditev projekta Red je vedno pas pripet;
- izvedba medobčinskega tekmovanja Kaj veš o prometu;
- izvedba aktivnosti, ki so namenjene mladim kolesarjem – akcija Bistro glavo varuje čelada;
- izvedba vzgojno-preventivnega dne za dijake srednjih šol in učence zadnje triade OŠ Maribor mladim za varno mobilnost;
- varovanje otrok na šolskih poteh (prva dva tedna pred tremi osnovnimi šolami);
- izvedba akcije Drugače na pot – v šolo s kolesom, Evropski teden mobilnosti;
- izvedba akcije Bodi preViden v lokalnem okolju, Akcija pešec v prometu.

Poleg vseh naštetih akcij in prireditev, s katerimi ozaveščamo ljudi in predvsem našo ciljno populacijo, to so dijaki, smo se pridružili tudi nacionalnemu projektu Zavoda Republike Slovenije za šolstvo.

PROJEKT DIJAKI DIJAKOM ZA VARNO MOBILNOST

V šoli smo pristopili k projektu Zavoda RS za šolstvo z akcijo Dijaki dijakom za varno mobilnost. S tem projektom in akcijo želimo o pomenu varne mobilnosti ozavestiti čim večje število dijakov. V ta namen smo kot neformalno obliko povezovanja dijakov na srednjih šolah oblikovali tudi klub Dijaki za varno mobilnost z imenom »Stara lokomotiva«. Klub ima tudi svoj logotip, ki je prikazan na sliki 2.

Slika 34: Logotip kluba Stara lokomotiva

Vir: Lasten

V klubu dijaki opravljajo različne aktivnosti s ciljem razvijanja kompetenc varne mobilnosti, se medsebojno povezujejo in predstavljajo svoje dosežke na področju varne mobilnosti. V okviru kluba smo izvedli veliko različnih akcij in delavnic, s pomočjo katerih je bila zelo povišana raven ozaveščenosti dijakov na področju prometne varnosti. Bili smo gostje oziroma smo v goste povabili različne strokovnjake, društva in organizacije, ki so izvedli naslednje aktivnosti (projekt Dijaki dijakom za varno mobilnost):

- delavnica Varnostna razdalja, kjer smo s pomočjo radarja merili hitrost različnih udeležencev v prometu in ugotavljali vpliv hitrosti na pot ustavljanja;
- delavnica 5x stop je cool, kjer smo se seznanili z različnimi posledicami prometnih nesreč, predvsem pa, kako različni dejavniki vplivajo na varnost v cestnem prometu;
- preizkusili smo se na simulatorju vožnje podjetja NERVteh v prostorih zavarovalnice Triglav;
- delavnica Kako (p)ostanem varen voznik voznica?; Avto-moto zveza Slovenije (AMZS) je dijake poučila o vzrokih prometnih nesreč, pogovarjali smo se o izkušnji prometne nesreče in ustvarjali vsebine na temo prometne nesreče in ukrepanja;
- organizirali smo okroglo mizo ob svetovnem dnevu spomina na žrtve prometnih nesreč;
- izvedli smo tri regijska srečanja za sodelujoče v projektu in še mnoge druge aktivnosti.

Slika 35: Simulator vožnje podjetja NERVteh

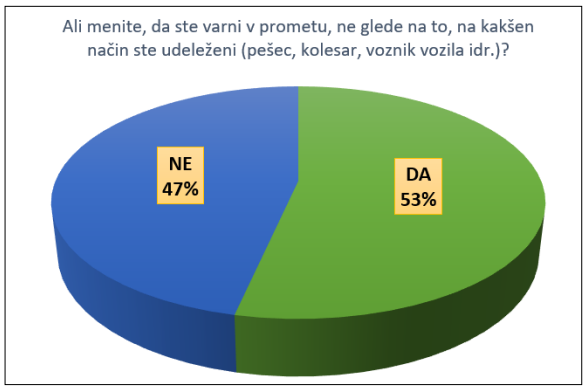
Vir: Lasten

V naši regiji smo tudi regijsko središče te akcije in združujemo štiri srednje šole. Ideja akcije je, da pri dijakih dosežemo naslednje cilje:

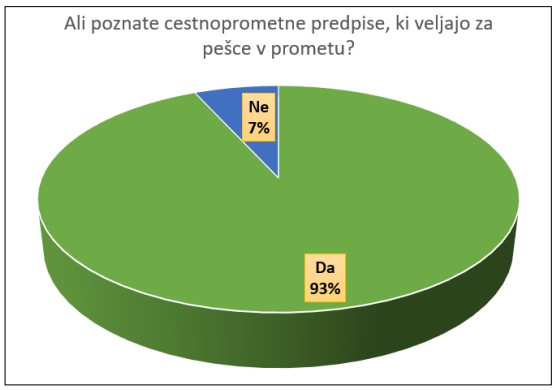
- razumejo dogajanje v cestnem prometu z vidika varne mobilnosti;
- pridobivajo in okrepijo znanje in veščine za varno ravnanje v cestnem prometu;

- prepoznajo ustrezno ravnanje v cestnem prometu in širijo (svoje pozitivne) izkušnje med druge dijake;
- spodbudijo vrstnike k čim večji vključenosti v aktivnosti akcije.

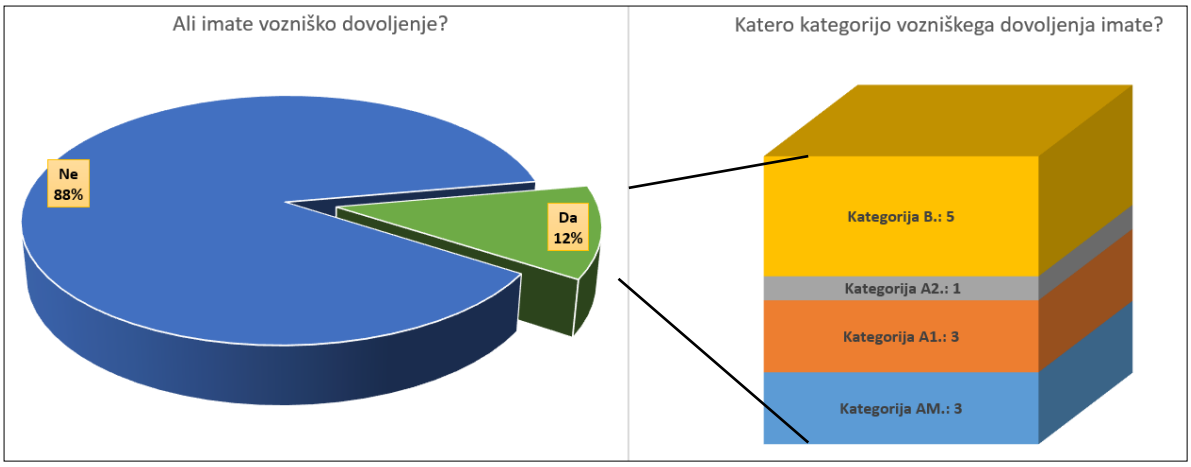
V okviru kluba smo izvedli tudi anketo Moj občutek varnosti v prometu, s katero smo želeli od dijakov predvsem izvedeti, ali se v prometu počutijo varne. V nadaljevanju so predstavljeni rezultati ankete, v kateri je sodelovalo 59 dijakov drugih in tretjih letnikov.
Iz ankete lahko razberemo, da se skoraj polovica vprašanih v prometu ne počuti varno, skoraj vsi pa menijo, da poznajo cestnoprometne predpise, ki veljajo za udeležence v prometu, čeprav še jih večina nima vozniškega dovoljenja.



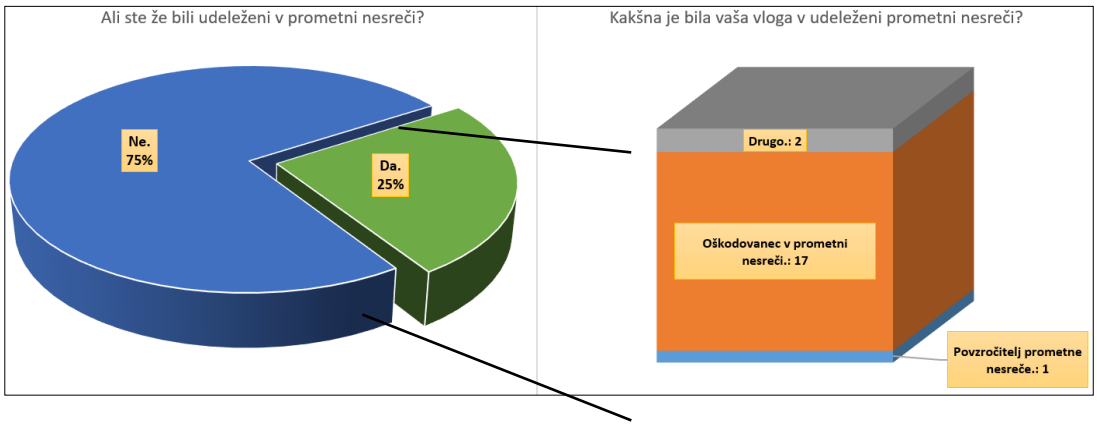
Graf 3: Anketno vprašanje 1



Graf 4: Anketno vprašanje 2



Graf 5: Anketno vprašanje 3



Graf 6: Anketno vprašanje 4

Med dijaki pretežno vlada prepričanje, da imajo dovolj znanja s področja cestnoprometnih predpisov, a se v praksi velikokrat pokaže, da ni tako. Predvsem pri pešcih je veliko pomanjkanja znanja, saj jih večina pridobi potrebna znanja šele takrat, ko pridobivajo eno izmed kategorij vozniškega izpita.

ZAKLJUČEK

Kot šola delamo veliko, da bi populacijo, ki nam je zaupana, ozavestili, kako pomembno je področje prometne varnosti. V programu Logistični tehnik se dijaki v modulu Etika v cestnem prometu seznanjajo s pomenom prometne varnosti, pri Logistiki tovornih tokov se seznanjajo z infrastrukturo in suprastrukturo v vseh prometnih podsistemih in geografskih pogojih prometa, v modulu Transportna sredstva pa se seznanijo z napravami in delovanjem naprav v strojih in prevoznih sredstvih. Tudi pri tujih jezikih je omenjeni tematiki posvečeno kar nekaj časa, da se seznanijo tudi s posebnostmi v angleško in nemško govorečih državah.
Država je prek resolucije poskrbela, da imamo vsaj zapisano pot do cilja večje ozaveščenosti na področju prometne varnosti, ter zapisala glavne nosilce, med katerimi smo tudi srednje šole. Z gotovostjo lahko zatrdimo, da smo na tem področju storili veliko in še naprej bomo, ne samo za dijake naše šole, ampak skozi različne prireditve in zelo močno vključenostjo v lokalno skupnost tudi za preostale zainteresirane.

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SAFE MOBILITY OF STUDENTS AT MARIBOR TRAFFIC SCHOOL

Summary:

In this paper, we presented the bases, activities and goals in the field of safe mobility of road users, which is detailed in the Resolution of the National Road Safety Program for the period from 2013 to 2022. We especially focused on the population of students involved in secondary school education system and road safety content that they should be familiar with. As a school, we are obliged and committed to raising students' awareness of the importance of traffic safety, and especially as a school that educates in the field of transport and logistics. We try to bring these contents closer to students and the wider environment through various subject areas, especially through extracurricular activities, where we act as organizers and participants in various projects and events of the school and the local community.

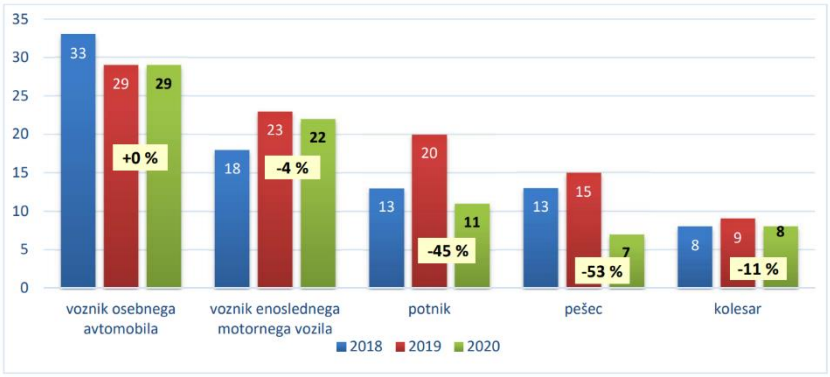
Keywords: traffic safety, safe mobility, traffic education, AVP, SPV

INTRODUCTION

Safe on the road or safe mobility has in recent years been the initiative of various preventive actions in Slovenia under the auspices of the Public Agency of the Republic of Slovenia for Traffic Safety (hereinafter AVP).

Today, mobility allows us to travel because of our own needs to achieve travel goals. The modes of travel have changed or motorized - the use of a car or public passenger transport. As a result, road safety has become an important societal issue. Based on the guidelines in the European Union and national interests, a Resolution on the National Road Safety Program for the period from 2013 to 2022 was prepared (Resolution of the National Road Safety Program for the period from 2013 to 2022)

Unfortunately, things happen in traffic that we don't want. Traffic accidents are the consequences of traffic actors: vehicles, traffic areas and road users. Because car driving is accessible to almost everyone today, it's hard to focus on the culprit of most accidents. Therefore, road accidents have many negative consequences as they cause loss of resources, human lives and well-being. Graph 1 shows the deaths on Slovenian roads in the period from 2018 to 2020.



Graph 7: Deaths of participants in traffic accidents by type of participant in the period 2018-2020

Source: https://www.avp-rs.si/wp-content/uploads/2021/03/analiza-in-pregled-stanja-varnosti-cestnega-prometa-v-letu-2020.pdf (obtained 31. 5. 2021)

Graph 1 shows, at first sight, a significant reduction in the number of deaths in road accidents. However, despite a significant reduction in traffic, measures to curb the epidemic in the group of car drivers, the number of deaths remained at the same level as the year before.

RESOLUTION OF THE NATIONAL ROAD SAFETY PROGRAM FOR THE PERIOD 2013-20120

The National Road Safety Program also follows other principles that enable the effectiveness and feasibility of the National Road Safety Program.

These principles are:

- social support,
- feasibility,
- flexibility / pragmatism,
- timeliness / adequacy,
- coherence of the level of observation (international / national / local),

– rationality / optimality / efficiency,
– transparency / traceability / comparability,
– responsibility,
– systematic,
– measurability and other principles.

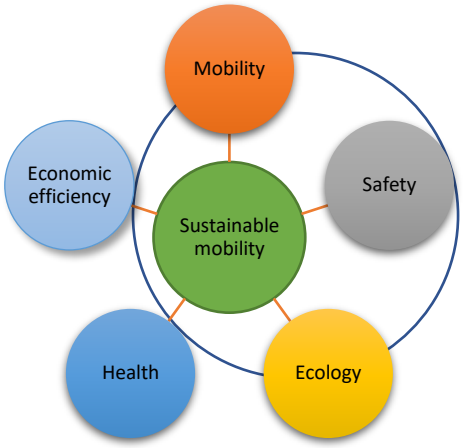


Figure 36: Principles of road safety

Source: Adapted from: Resolution of the National Road Safety Program for the period from 2013 to 2022. (31. 5. 2021)

The strategy of the national program ensures the planned approach to the set goals and their achievement. It creates a basis for joint planning, implementation of the national program and involvement of all possible activities and entities that are obliged or willing to contribute in any way to road safety.
The field of education in the Republic of Slovenia is specifically mentioned in the resolution as a very important field that must contribute to the goals of improving traffic safety. Road safety is thus an important part of the company's operations, and the current curricula include verticaly transport content, from pre-school education, primary education to secondary education. Traffic education and lifelong learning contribute to the formation of appropriate attitudes towards individual safety factors and to appropriate traffic behavior. The condition for the formation of appropriate attitudes and safe behavior is the acquisition and constant renewal of knowledge and skills for safe participation in transport.
Transport education and lifelong learning for safe cooperation in transport take place in several stages of life, which significantly affect the organization, content and forms of work:

– first period of life (pregnancy and first year of life),
– traffic education in the pre-school period,
– traffic education during the period of primary school education,
– safety during vocational and secondary education,
– training for driving motor vehicles,
– lifelong learning for safe transport participation.

Table 1 defines the life spans and the role that traffic education has on participants. There are also designated institutions that are obliged to carry out individual activities to increase traffic safety for all road users at all ages.

Table 2: The role of traffic education in life stages and responsible traffic education providers

LIFE PERIOD	ROLE	CARRIER OPERATOR
FIRST PERIOD OF LIFE	A child in the first period of life is involved in traffic and is endangered mainly in the role of a passenger (parents are key).	AVP, schools for parents, child health care providers at the primary level.
TRAFFIC EDUCATION IN PRESCHOOL PERIOD	A child in the first period of life is involved in traffic and is endangered mainly in the role of a passenger (parents are key).	AVP, schools for parents, child health care providers at the primary level.
TRAFFIC EDUCATION IN THE PERIOD OF EDUCATION IN PRIMARY SCHOOL	FIRST TRILE (FROM 6 TO 8 YEARS) Pupils participate in traffic mainly as passengers and pedestrians, so the contents of traffic education are focused primarily on the knowledge and skills that a child must master to safely participate in traffic as a pedestrian, passenger in a car and public transport, and must prepare on independent cycling. SECOND THREE YEARS (FROM 9 TO 11 YEARS) Traffic education for this age group is focused primarily on the preparation and implementation of a training program for students to ride a bike. THIRD THREE YEARS (FROM 12 TO 14 YEARS) Children at this age participate in traffic in all roles. They are pedestrians, passengers, cyclists and often also drivers of vehicles that, given their age, should not be driven yet. This is an age in which we should pay particular attention to the renewal and maintenance of knowledge and safe behavior and promote the adoption of moral norms important for safe participation in transport..	AVP, ministry responsible for education, science and sports, primary schools, NGOs, municipal councils for prevention and education in road traffic.
SAFETY DURING VOCATIONAL AND SECONDARY EDUCATION (15 TO 24 YEARS)	Public schools and driver's schools must ensure that young people acquire new knowledge and skills, and have an impact on changing attitudes and behavior towards weaker road users, alcohol, speed, seat belts and other important safety factors.	primary, secondary and vocational schools and gymnasiums in Slovenia, driving schools, AVP, NGOs
LIFELONG LEARNING FOR SAFE COOPERATION IN TRANSPORT	Lifelong learning and the maintenance of driving skills are therefore essential for safe participation in transport.	AVP

Source: Adapted from: Resolution of the National Road Safety Program for the period from 2013 to 2022. (31. 5. 2021)

It follows from the Resolution of the National Road Safety Program for the period from 2013 to 2022 that traffic education is provided at the national level. The activities, measures and roles of traffic education providers are precisely defined. For us as a secondary school, this means that, according to the resolution, we are committed to contributing our part to better education and awareness of road users for the 15-19 age group, which is marked in red in Table 1.

TRAFFIC SAFETY AT THE TRAFFIC SCHOOL MARIBOR

The resolution on the national road safety program for secondary schools envisages certain knowledge or competencies that students are expected to address during this period:

- students explain traffic safety;
- development of transport means of communication;
- anticipate traffic hazards and learn the basics of physical content (path, speed, acceleration, friction, collision);
- evaluate transport for health protection and environmental protection;
- learn traffic rules and the meaning of traffic signs in foreign languages;
- learn traffic safety, traffic psychology, traffic ethics;
- operation of various machines.

In a foreign language, they write traffic notices on traffic safety, on orientation in the traffic area, taking into account instructions and prohibitions (use of public transport, development of personal responsibility, education for proper behavior of a student as a participant in traffic). They explain the development of means of transport and communication, assess the importance of means of transport and communication for the growing cohesion of the world, and anticipate dangers in transport. They value Slovenia's traffic position in Europe; with the transport map of Europe they get to know the transport network in Slovenia (roads, railways, airports, ports) and evaluate its importance for individual areas in Slovenia, assess the importance of transport for economic development, assess the threat to the environment due to road transport (infrastructure development, expansion, air pollution) and water due to traffic and sewage), in the field count the traffic around the school and prepare a report with suggestions for improvements to the current situation. They analyze the existing traffic structure of various cities and plan changes, get acquainted with the forms of existing traffic regulation, analyze the traffic situation, look for alternative solutions to improve the traffic situation in specific world cities, present traffic analysis and proposed changes in their place. They get acquainted with the contents: stationary traffic, motor traffic, public transport, bicycle transport, pedestrian zones and alternative public transport solutions (greenhouse gas emissions - global warming). They get to know the history of everyday life: traffic, roads, travelers, they get acquainted with the history of traffic (transport connections and trade). They analyze the impact of inventions on the development of individual types of transport, in the context of electives they get acquainted with the knowledge of traffic regulations (CPP).

In its annual work plan, the Maribor Traffic School enables its pupils and students to participate in the preventive education of traffic safety. In addition to all the activities that we carry out within various

activities, educational programs in the field of logistics already have a lot of content in the basic curriculum, which contributes to greater awareness and knowledge of the field of traffic safety.
In addition to regular educational work, the school holds a Traffic Safety Day event in May every year, which includes various providers, such as the police, city police, various associations and institutions that take care of prevention and education in road traffic. The organization of the event was taken over by the Maribor College of Transport, which ensures that lectures and presentations are provided for all high school and university students, as well as for all other interested groups.
As a school, we are also very involved in the local environment, where we participate very well in the preventive actions of the Council for Prevention and Education in Road Traffic of the Municipality of Maribor. We actively cooperate with third-year students and students of the traffic circle at various events, and we especially like to hang out with experienced volunteers from the Association of Drivers and Car Mechanics and the Council for Prevention and Education in Road Traffic. Among other things, we participate in the following events every year:

- the final event of the project Order is always a belt fastened;
- implementation of the inter-municipal competition What do you know about traffic;
- implementation of activities intended for young cyclists – campaign The clever head is protected by a helmet;
- implementation of an educational and preventive day for high school students and students of the last triad of the Maribor Primary School for young people for safe mobility;
- protection of children on school routes (first two weeks in front of three primary schools);
- implementation of the campaign Differently on the road - to school by bike, European Mobility Week;
- implementation of the campaign Be careful and seen in the local environment, Pedestrian in traffic campaign.

In addition to all the listed campaigns and events, which raise awareness of people and especially our target population, we also joined the national project of the Institute of the Republic of Slovenia for Education.

PROJECT STUDENT TO STUDENT FOR SAFE MOBILITY

At school, we approached the project of the National Education Institute of the Republic of Slovenia with the campaign Students for Students for Safe Mobility. With this project and campaign, we want to make as many students as possible aware of the importance of safe mobility. For this purpose, as an informal form of connecting students in secondary schools, we also formed the club Students for Safe Mobility called "Old Locomotive". The club also has its own logo, which is shown in Figure 2.

Figure 37: Old locomotive club logo

Source: Own

In the club, students perform various activities with the aim of developing safe mobility competencies, connect with each other and present their achievements in the field of safe mobility. Within the club, we carried out many different campaigns and workshops, with the help of which the level of awareness of students in the field of traffic safety was greatly increased. We were guests or we invited various experts, associations and organizations who carried out the following activities (project Students to students for safe mobility):

- Safety distance workshop, where we used radar to measure the speed of various road users and determine the impact of speed on the stopping distance;
- workshop 5x stop is cool, where we learned about the different consequences of traffic accidents, and especially how different factors affect road safety;
- we tested ourselves on the driving simulator of the company NERVteh in the premises of the insurance company Triglav;
- workshop How do I stay a safe driver?; The Automobile and Motorcycle Association of Slovenia (AMZS) taught students about the causes of traffic accidents, we talked about the experience of traffic accidents and created content on the topic of traffic accidents and actions;
- we organized a round table on the occasion of the World Day of Remembrance for Road Traffic Victims;
- We conducted three regional meetings for project participants and many other activities.

Figure 38: Driving simulator from NERVteh

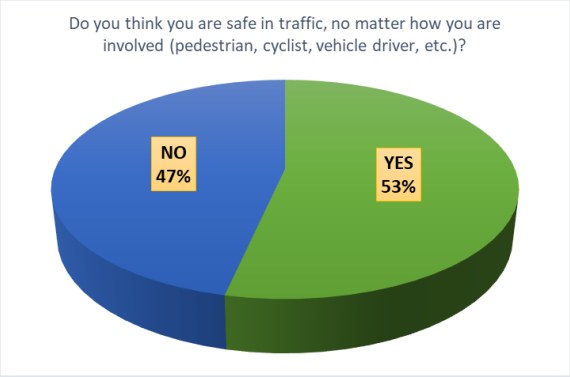
Source: Own

In our region, we are also the regional center of this campaign and we unite four high schools. The idea of the campaign is to achieve the following goals for students:

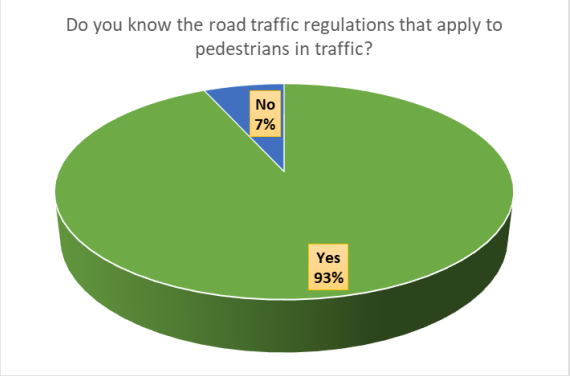
- understand what is happening in road transport from the point of view of safe mobility;
- acquire and strengthen knowledge and skills for safe handling in road traffic;
- recognize appropriate behavior in road traffic and spread (their positive) experiences among other students;
- encourage peers to be as involved as possible in the activities of the campaign.

Within the club, we also conducted a survey My sense of safety in traffic, with which we wanted to find out from students whether they feel safe in traffic. The results of a survey in which 59 second- and third-year students participated are presented below.

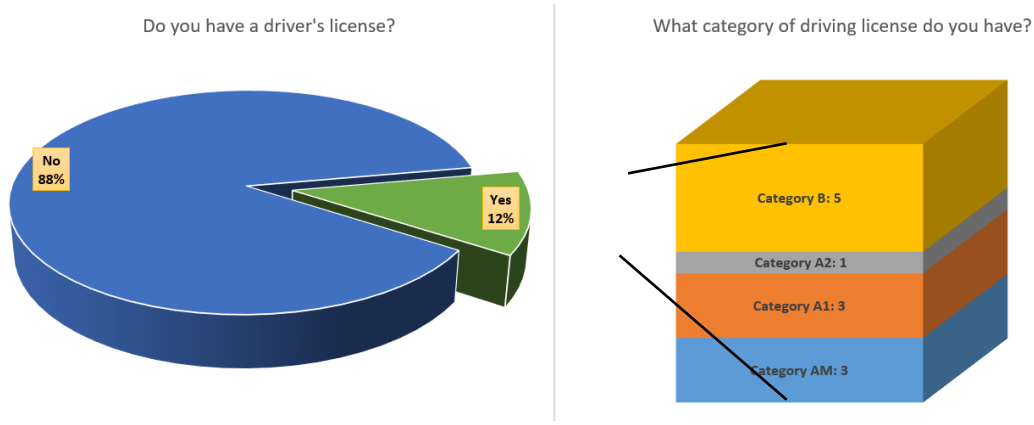
We can see from the survey that almost half of the respondents do not feel safe in traffic, and almost all of them believe that they know the road traffic regulations that apply to road users, although most of them do not yet have a driver's license.



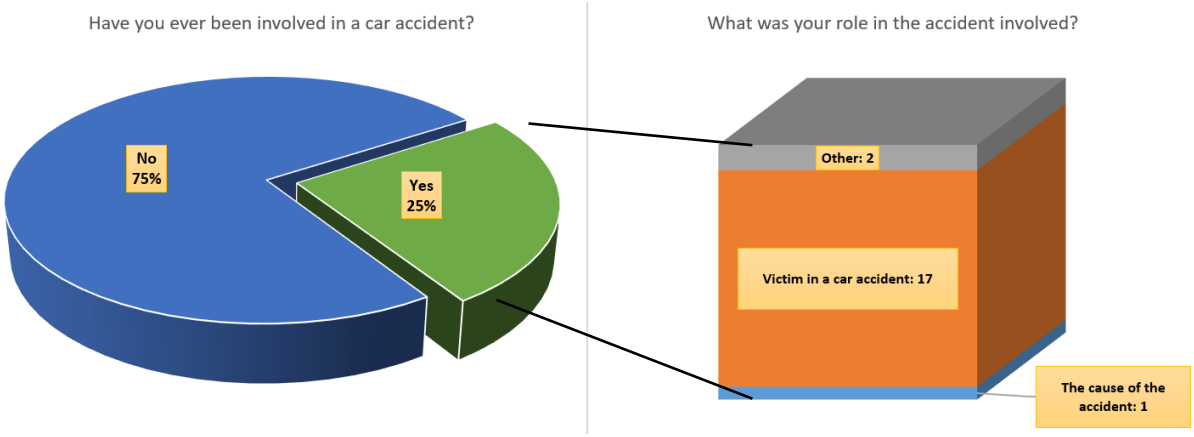
Graph 8: Survey question 1



Graph 9: Survey question 2



Graph 10: Survey question 3



Graph 11: Survey question 4

There is a strong belief among students that they have enough knowledge in the field of road traffic regulations, but in practice it often turns out that this is not the case. There is a great lack of knowledge, especially among pedestrians, as most of them acquire the necessary knowledge only when they acquire one of the categories of the drivers licence.

CONCLUSION

As a school, we do a lot to make the population in the schools aware of the importance of road safety. In the Logistics Technician program, students in the module Road Traffic Ethics get acquainted with the importance of traffic safety, in the Freight Flow Logistics they get acquainted with infrastructure and superstructure in all transport subsystems and geographical traffic conditions, and in the Transport Means module they get acquainted with devices and machinery and means of transport. In the case of foreign languages as well, some time is devoted to this topic, so that they also become acquainted with the peculiarities of English and German-speaking countries.

Through the resolution, the state made sure that we have at least a written path to the goal of greater awareness in the field of traffic safety, and listed the main institutions, including high schools. We can say with certainty that we have done a lot in this area and will continue to do so, not only for the students of our

school, but through various events and very strong involvement in the local community for other interested parties.

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