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Kazalo / Table of Contents

Prispevki / Articles

REVIJA ZA ELEMENTARNO IZOBRAŽEVANJE
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POMEN GIBALNIH/ŠPORTNIH AKTIVNOSTI PRI OBVLADOVANJU VEDENJSKIH TEŽAV UČENK IN UČENCEV V OSNOVNI ŠOLI

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Izvleček/Abstract Ukvarjanje z gibalnimi/športnimi aktivnostmi ponuja otroku možnosti za sodelovanje z drugimi, samopotrjevanje in izražanje ter pomeni enega izmed ključnih dejavnikov socializacije ter preprečevanja odklonskega vedenja. V raziskavi nas je zato zanimalo, katere značilnosti gibalne/športne aktivnosti so najmočneje povezane z obvladovanjem vedenjskih težav. Ugotovitve na reprezentativnem vzorcu 1782 slovenskih osnovnošolcev kažejo, da je gibalna/športna aktivnost najmočneje povezana z obvladovanjem vedenjskih težav ponotranjenja. Pri tem imajo ključno vlogo pogostnost in intenzivnost aktivnosti, vključitev v interesne športne dejavnosti, ukvarjanje s plesom ter omejitev sedečega načina prevoza v šolo.

Ključne besede:
osnovna šola, disciplina, hiperaktivnost, šport, zdrav življenjski slog.

The Role of Physical/Sporting Activities in Coping with Behaviour Problems among Primary School Students

Physical/sporting activities provide a child with opportunities to interact with others, validate and express him/herself, while also being critical factors in socialisation and the prevention of deviant behaviour. Therefore, in this study, we were interested in which physical/sporting activities are most strongly associated with the management of behaviour problems. Results from a representative sample of 1782 Slovenian primary school students show that a lack of physical/sporting activity is the strongest predictor of internalising behaviour problems. In this context, key roles are played by the frequency and intensity of activity, extracurricular sports activities, practising dance and limiting sedentary transportation to school.

Keywords:
primary school, discipline, hyperactivity, sport, healthy lifestyle.

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Uvod

Sodobni način življenja, ki omogoča številne izbire, informacije in hiter tempo življenja, ima lahko negativen vpliv na otrokov socialni razvoj in spodbuja pojav vedenjskih težav (Payne in Ross, 2009). Neustrezni vedenjski odzivi vključujejo širok spekter, ki sega od socialne neprilagojenosti do nenormalnih čustvenih odzivov ter se pojavlja v obliki različnih težavnostnih stopenj. Otroci s čustveno-vedenjskimi težavami težko upoštevajo šolska pravila in še težje izpolnjujejo pričakovanja učitelja oz. učiteljice (Kobolt, 2011).

Vedenjske težave so odvisne od notranjih (npr. razpoloženje) in zunanjih (npr. socialno okolje, vrstniki, učitelji, šolska klima) spodbud (Kranjčan, 2007). Gresham in Elliott (1990) sta na osnovi pregleda raziskav razdelila vedenjske težave otrok in mladostnikov na tri področja: težave pozunanjenja (angl. externalizing problem behaviors), težave ponotranjenja (angl. internalizing problem behaviors) in težave hiperaktivnosti (angl. hyperactivity). Pri tem se izražanje vedenjskih težav pozunanjenja kaže v obliki vedenj, ki vključujejo verbalno ali fizično agresivnost proti drugim, šibko samokontrolo jeze ter prepiranje. Vedenjske težave ponotranjenja se lahko prepoznajo po anksioznosti, občutkih žalosti in osamljenosti ter nizki samopodobi. Hiperaktivnost otroka pa se odraža s pretiranimi telesnimi gibi, nemirnostjo in z impulzivnimi reakcijami.

Raziskave (Rutter in Mortimore, 1980, v Blandford, 1998) so pokazale, da na pojav vedenjskih težav otrok pomembno vplivajo dejavniki v šolskem okolju, kot so šolska politika, kurikulum, način komunikacije, sodelovanja med šolo in družino, sistem nagrajevanja in kaznovanja ter učiteljevo vodenje razreda. Med pomembnimi dejavniki uravnavanja nezaželenega vedenja je dokazano tudi redna gibalna/športna aktivnost, ki lajša psihično napetost, anksioznost in duševno utrujenost ter s tem prispeva k prilagajanju in čustveni stabilnosti (Lee in Jeoung, 2016). Gibalne/športne aktivnosti omogočajo otroku socializacijo in navezovanje stikov z vrstniki in vrstniškimi skupinami (Smith in Smoll, 1991; Ekeland, Heian, Hagen, Abbott in Nordheim, 2004; Vahedi, Farrokhi in Farajian, 2012; Zurc, 2012). Pri tem se otrok uči sodelovanja z drugimi, upoštevanja pravil in različnosti ter razvija pozitivno pojmovanje samega sebe (Kraljič, 2001; Šimunič, Pišot in Planinšec, 2010; Virag in Dolenc, 2016). Ob tem gibalne/športne aktivnosti omogočajo senzorično izkušnjo, ki povečuje pozornost in motivacijo za učenje, to pa ustvarja pozitivno učno okolje zlasti za vizualne, slušne in kinestetične učenke in učence (Ackerman, 2018).

Raziskava (Zurc in Jelovčan, 2017) o pojavu vedenjskih težav pri otrocih, starih 9–11 let, je pokazala, da je pogostnost in intenzivnost katere koli oblike gibalne/športne aktivnosti povezana z obvladovanjem hiperaktivnosti ter občutkov anksioznosti, žalosti in osamljenosti. Nasprotno pa je ta raziskava pokazala, da sedeče (sedentarne) dejavnosti, kot sta gledanje televizije in delo z računalnikom, prispevajo k pojavu nemirnosti in impulzivnega vedenja ter verbalne in fizične agresivnosti proti drugim. Postavlja se vprašanje, kateri so tisti ključni elementi oz. značilnosti prostočasne gibalne/športne aktivnosti, ki imajo pozitiven vpliv na spodbujanje zaželenih vedenj ter obvladovanje vedenjskih težav pozunanjenja, ponotranjenja in hiperaktivnosti.

Gibalno/športno udejstvovanje namreč vključuje širok razpon različnih oblik »premikanja telesa, ki je povezano s krčenjem mišic ter povečano porabo energije nad ravnijo v mirovanju« (EU Physical Activity Guidelines, 2008, str. 3). Gibalne/športne aktivnosti se lahko izvajajo v rekreaciji, z namenom premikanja iz kraja v kraj, pri delu, gospodinjskih opravilih, pri igri, športni vadbi ter skupnem preživljanju prostega časa v družini ali s prijatelji (WHO, 2020). Pogostnost, intenzivnost, vrsto in obliko gibalne/športne aktivnosti otrok lahko sooblikujejo različni dejavniki, med katerimi ima pomemben vpliv tudi gibalno/športno udejstvovanje staršev (Schoeppe idr., 2016).

Kljub nespornim dokazom o pomenu gibalne/športne aktivnosti za otrokov socialni razvoj in obvladovanje nezaželenih vedenj (Smith in Smoll, 1991; Vahedi idr., 2012; Lee in Jeoung, 2016; Zurc in Jelovčan, 2017; Pleško Zalar, 2018; Kamas, Zubaidi in Zaid, 2021) nimamo dovolj dokazov, da bi lahko opredelili, katera gibalna/športna aktivnost je najbolj primerna. Zato so bili cilji naše raziskave:

- ugotoviti značilnosti gibalnega/športnega udejstvovanja pri učenkah in učencih v drugem vzgojno-izobraževalnem obdobju osnovne šole;
- ugotoviti pojavnost vedenjskih težav ponotranjenja, pozunanjenja in hiperaktivnosti pri proučevani populaciji;
- proučiti povezave med posameznimi značilnostmi gibalne/športne aktivnosti oz. neaktivnosti ter pojavnostjo vedenjskih težav pri proučevani populaciji.

Empirična raziskava

Prispevek predstavlja rezultate empirične neeksperimentalne kvantitativne raziskave, ki je bila izvedena na reprezentativnem vzorcu učenk in učencev drugega vzgojno-izobraževalnega obdobja slovenskih osnovnih šol.

Merski instrumenti in postopek zbiranja podatkov

Zbiranje podatkov je potekalo z dvema merskima instrumentoma, ki so ju izpolnjevali anketirani učenci in učenke ter njihovi učitelji razredniki oz. učiteljice razredničarke v osnovni šoli. Slednji so ocenjevali vedenjske težave otrok, medtem ko smo vpogled v gibalno/športno udejstvovanje otrok v prostem času pridobili na osnovi samoocene učencev in učenk. Oba vprašalnika sta vključevala tudi socialno-demografske spremenljivke, kot so spol, starost, razred in vrsta osnovne šole, pri učiteljih oz. učiteljicah pa še stopnjo dosežene izobrazbe in leta delovne dobe.

Za ocenjevanje vedenjskih težav otrok smo uporabili standardizirani vprašalnik SSRS (angl. Social Skills Rating System), ki smo ga prevedli in validirali za uporabo v slovenskem prostoru. Avtorja testa sta ameriška raziskovalca Gresham in Elliott (1990). Test SSRS meri razvitost otrokovih socialnih spretnosti na treh temeljnih področjih socialnega razvoja: socialne spretnosti, šolska uspešnost in vedenjske težave. V prispevku predstavljamo rezultate testa ocenjevanja vedenjskih težav, ki so ga izpolnjevali učitelji oz. učiteljice proučevanega vzorca otrok. Lestvica ocenjevanja vedenjskih težav vključuje 18 trditev, ki ocenjujejo tri področja: 1) težave pozunanjenja (6 trditev), 2) težave ponotranjenja (6 trditev) in 3) hiperaktivnost (6 trditev). Vsako trditev so učitelji oz. učiteljice ocenile s 3-stopenjsko ocenjevalno lestvico: 0 – vedenje se nikoli ne pojavi, 1 – vedenje se pojavlja občasno in 2 – vedenje se pojavlja zelo pogosto. Vključene spremenljivke ocenjevanja vedenjskih težav z opisno statistiko so predstavljene v tabeli 4.

Podatki o prostočasni gibalni/športni aktivnosti otrok so bili zbrani s strukturiranim anketnim vprašalnikom, ki so ga individualno izpolnjevali anketirani otroci sami. Vprašalnik smo sestavili na osnovi pregleda literature. Vsa vprašanja o gibalni/športni aktivnosti so bila zaprtega tipa. Vsebina in ocenjevalne lestvice posameznih proučevanih spremenljivk so predstavljene v rezultatih.

Oba uporabljena merska instrumenta sta bila s pilotno študijo testirana na eni izmed gorenjskih osnovnih šol z vidika veljavnosti, zanesljivosti, objektivnosti in občutljivosti merjenja ter na osnovi dobljenih rezultatov izpopolnjena in validirana za uporabo na populaciji učenk in učencev drugega vzgojno-izobraževalnega obdobja osnovne šole. V pilotni študiju je sodelovalo 151 otrok. Cronbachov koeficient alfa je pokazal visoko interno konsistentnost obeh instrumentov, in sicer je znašal za test SSRS 0,851 in za vprašalnik o gibalni/športni aktivnosti 0,841.

Opis vzorca

V raziskavi smo proučevali učenke in učence drugega vzgojnega izobraževalnega obdobja osnovne šole. Vzorčni okvir so predstavljale vse osnovne šole v Republiki Sloveniji. Metoda vzorčenja je bila slučajnostno tristopenjska. Na prvi stopnji smo z metodo slučajnega izbora iz dvanajstih slovenskih statističnih regij izbrali 16 osnovnih šol, skupaj s podružničnimi šolami. Na drugi stopnji vzorčenja so bili v navedenih šolah izbrani učenci in učenke od 4. do 6. razreda, katerih vodstva šol in razredniki oz. razredničarke so pristopili k sodelovanju v raziskavi. Na tretji stopnji vzorčenja so bili izbrani vsi učenci in učenke teh razredov, katerih starši so podali soglasje k sodelovanju v raziskavi in ki so bili na dan in uro izvedbe raziskave prisotni v razredu. K sodelovanju v raziskavi je bilo povabljenih 2192 učenk in učencev. Končni vzorec v raziskavi dejansko sodelujočih pa predstavlja 1782 udeležencev, od tega 52 % učenk in 48 % učencev, povprečne starosti 10,40 ± 0,93 let. Realizacija vključenega vzorca je bila 81,3 %. Vključeni so bili učenci in učenke četrtega (32,7 %), petega (33,3 %) in šestega (34,0 %) razreda drugega vzgojno-izobraževalnega obdobja osnovne šole. Iz matičnih osnovnih šol jih je bilo 86,6 %, iz njihovih podružnic pa 13,4 %. Za navedeni vzorec smo pridobili podatke o gibalni/športni aktivnosti na osnovi samoocenjevanja ter podatke o pojavnosti vedenjskih težav na osnovi ocenjevanja učitelja razrednika oz. učiteljice razredničarke.

V raziskavi je sodelovalo 129 učiteljev razrednikov oz. učiteljic razredničark, ki so poučevali učenke in učence, vključene v raziskavo. Vedenjske težave svojih učenk in učencev je ocenjevalo 89,1 % učiteljic in 10,9 % učiteljev. Glavnina anketiranih je imela zaključeno univerzitetno izobrazbo profesorja/profesorice razrednega pouka na Pedagoški fakulteti (53,3 %) ali Pedagoško akademijo (45 %). Povprečna delovna doba vključenih zaposlenih je bila 18 ± 1,18 leta. Dobljeni podatki so posplošljivi za populacijo učenk in učencev drugega vzgojno-izobraževalnega obdobja osnovne šole v Republiki Sloveniji.

Metode analize podatkov

Zbrani podatki o gibalni/športni aktivnosti in vedenjskih težavah so bili obdelani s statističnim paketom SPSS 20.0. Izračunane so bile mere opisne statistike (frekvence, odstotki, mere srednjih vrednosti in razpršenosti podatkov) ter bivariatne analize. Za preverjanje razlik med spoloma v merjenih spremenljivkah gibalne/športne aktivnosti in vedenjskih težav smo uporabili hi-kvadrat test in dvostranski t-test za neodvisne vzorce. Za ugotavljanje razlik med sedečim vedenjskim slogom med šolskim tednom in koncem tedna je bil uporabljen dvostranski t-test za odvisne vzorce. Statistično značilne povezanosti med značilnostmi gibalne/športne aktivnosti in vedenjskimi težavami pa smo ugotavljali s Spearmanovim koeficientom ranga korelacije. Za statistično značilne smo upoštevali rezultate s stopnjo statistične značilnosti $p \leq 0,05$.

Rezultati

Samoocenjevanje značilnosti gibalnega/športnega udejstvovanja v prostem času (tabela 1) je pokazalo, da je 88,9 % učenk in učencev drugega vzgojno-izobraževalnega obdobja osnovne šole gibalno/športno aktivnih ob redni šolski športni vzgoji vsaj še dvakrat na teden, od tega jih je polovica (45,8 %) aktivnih vsak dan. Za povsem gibalno/športno neaktivne ali občasno aktivne se je opredelilo 11,1 % vprašanih. V organizirano vadbo v športnih klubih je vključenih 50,3 %, pri tem je bila povprečna dosedanja vključenost v organizirano vadbo dve leti in pol. Glede na intenzivnost prevladujeta srednje intenzivna (51,8 %) in visoko intenzivna vadba (37,1 %).

Osnovnošolci proučevane starostne skupine se najpogosteje ukvarjajo z gibalnimi/športnimi aktivnostmi skupaj s svojimi prijatelji, samostojno v domačem okolju ali pa v interesnih dejavnostih, ki so organizirane na šoli. V enajsterico njihovih najpopularnejših športnih zvrsti so se uvrstile igre z žogo (nogomet, rokomet, košarka), igre z loparji (badminton), neorganizirane gibalne/športne aktivnosti v naravi (hoja, planinarjenje, tek, rolanje, kolesarjenje) ter individualne športne panoge (ples, plavanje). Hoja je ob prevozu z avtomobilom tudi najpogostejši način prihoda otrok v šolo. Visoki standardni odkloni pri rangiranju gibalnih/športnih zvrsti ter v načinu prihoda v šolo kažejo na dokaj razpršena mnenja in različne načine gibalnega/športnega udejstvovanja učenk in učencev v prostem času.

Tabela 1. Značilnosti gibalne/športne aktivnosti učenk in učencev v prostem času

	Skupaj n/%	**Učenke n (%)**	**Učenci n (%)**	**χ^2 test**
Pogostnost:				
sploh nisem aktiven	35/2,0	16/1,8	18/2,2	
1- do 3-krat na mesec	49/2,8	20/2,2	28/3,4	
1-krat tedensko	109/6,2	80/8,9	29/3,5	
2- do 3-krat tedensko	423/24,2	240/26,6	180/21,8	< 0,001
4- do 5-krat tedensko	329/18,9	157/17,4	170/20,6)	
vsak dan	800/45,8	389/43,1	399/48,4	
Intenzivnost:				
nizka	193/11,1	116/12,9	75/9,1	
srednja	900/51,8	502/55,8	392/47,7	< 0,001
visoka	646/37,1	281/31,3	354/43,1	
Član športnega kluba/društva:				
da	880/50,3	415/46,1	455/54,9	< 0,001
ne	868/49,7	485/53,9	374/45,1	
Oblika gibalne/ športne aktivnosti:[1]	**PV/SO**	**PV/SO**	**PV/SO**	**t (p)**
doma vadi sam	2,36/0,61	2,38/0,58	2,35/0,64	0,275
v družini	2,18/0,64	2,22/0,64	2,13/0,64	0,007
s prijatelji	2,43/0,62	2,38/0,62	2,49/0,61	0,001
šolski športni krožek	2,25/0,75	2,28/0,74	2,23/0,76	0,159
športni klub/društvo	1,91/0,92	1,83/0,91	2,01/0,92	< 0,001
Trajanje organizirane vadbe:				
dosedanja vključenost (meseci)	29,64/21,23	28,78/21,71	30,28/20,90	0,386
Gibalne/športne zvrsti po popularnosti:[2]				
nogomet	2,20/3,33	2,25/3,92	2,16/2,57	0,588
kolesarstvo	3,45/2,73	3,65/2,86	3,23/2,56	0,003
hoja	3,44/3,15	3,42/3,02	3,46/3,31	0,782
ples	1,75/3,33	2,57/3,44	0,87/2,96	< 0,001
rolanje	3,36/3,47	3,84/3,40	2,87/3,46	< 0,001
tek	3,65/3,58	3,70/3,62	3,57/3,53	0,424
plavanje	2,79/3,84	3,04/3,78	2,54/3,90	0,007
rokomet	1,87/3,52	1,96/3,78	1,79/3,24	0,303
planinarjenje	2,60/3,72	2,84/3,79	2,35/3,63	0,006
badminton	3,01/3,71	3,48/3,68	2,48/3,65	< 0,001
košarka	2,81/3,94	2,73/4,29	2,93/3,54	0,280
Način prihoda v šolo:[3]				
hoja	1,82/2,25	1,86/2,25	1,79/2,27	0,585
kolesarjenje	0,37/1,14	0,33/1,06	0,42/1,22	0,096
avtobus	1,74/2,26	1,68/2,23	1,81/2,29	0,299
avtomobil	1,91/2,15	1,98/2,15	1,82/2,16	0,136

Legenda: PV – povprečna vrednost, SO – standardni odklon; t (p) – dvostranski t-test za neodvisne vzorce; [1] oblika aktivnosti merjena na 3-stopnjeski lestvici od 1 – nikoli do 3 –pogosto; [2] gibalne/športne aktivnosti rangirane na lestvici od 1 do 18 (1 = najpogostejše ukvarjanje); [3] število dni v tednu od 0 – nikoli do 5 – vsak dan.

Rezultati analize razlik med spoloma v tabeli 1 kažejo, da obstajajo v proučevanih značilnostih gibalne/športne aktivnosti razlike med učenkami in učenci. Učenci izražajo večjo pogostnost, intenzivnost in organiziranost gibalno/športnega udejstvovanja, medtem ko je za učenke značilno predvsem neorganizirano udejstvovanje v okviru družine. Učenci se več gibalno/športno udejstvujejo v večini aktivnosti, in sicer tako v naravi (npr. planinarjenje, rolanje, kolesarjenje) kot tudi v športnih objektih (npr. ples, badminton, plavanje).

Tabela 2. Pogostnost gibalne/športne aktivnosti staršev

	Gibalna/športna aktivnost mater n (%)	**Gibalna/športna aktivnost očetov n (%)**	**Pearsonov hi-kvadrat test (p)**
Nikoli	63 (3,6)	82 (4,8)	
Redko (do enkrat na mesec)	245 (14,1)	216 (12,5)	
Enkrat na teden	326 (18,7)	248 (14,4)	**< 0,001**
Večkrat na teden	702 (40,3)	648 (37,6)	
Vsak dan	407 (23,3)	531 (30,8)	

Po ocenah učenk in učencev so njihove matere najpogosteje gibalno/športno aktivne večkrat na teden (40,3 %) (tabela 2). Podobno velja tudi za gibalno/športno udejstvovanje očetov (37,6 %), pri čemer jih je tretjina (30,8 %) aktivnih tudi vsak dan. Razlike med spoloma se nadalje kažejo v občasni, neredni gibalni/športni aktivnosti in njeni odsotnosti, pri čemer prevladujejo matere (36,4 %) v primerjavi z očeti (31,7 %). Test hi-kvadrat je potrdil razlike med materami in očeti v pogostnosti gibalnega/športnega udejstvovanja s perspektive njihovega otroka ($p < 0,001$).

Tabela 3. Neaktivnost učenk in učencev v prostem času

Število ur sedenja na dan izven šolskega pouka	**Skupaj**	**Razlike med tednom in koncem tedna t (p)[1]**	**Učenke**	**Učenci**	**Razlike med spoloma t (p)[2]**
	PV/SO		**PV/SO**	**PV/SO**	
Med šolskim tednom	2,82/1,67	2,242/0,025	2,74/1,53	2,89/1,77	0,072
Med koncem tedna	2,73/1,59		2,69/1,44	2,76/1,71	0,309

Legenda:

PV – povprečna vrednost, SO – standardni odklon; [1] dvostranski t-test za odvisne vzorce;
[2] dvostranski t-test za neodvisne vzorce.

Gibalno/športno neaktivnost učenk in učencev smo ugotavljali z njihovo samooceno števila ur sedenja izven šole (tabela 3). Rezultati so pokazali povprečno skoraj tri ure sedenja na dan, pri čemer so bile ugotovljene razlike med šolskim tednom in koncem tedna (p = 0,025). Osnovnošolci več sedijo med šolskim tednom. Opaziti je, da učenci v primerjavi z učenkami nekoliko več sedijo izven šolskega pouka med tednom, vendar statistično značilne razlike med spoloma v številu ur sedenja po poročanju anketiranih otrok niso bile ugotovljene (p = 0,072).

Tabela 4. Ocena vedenjskih težav učenk in učencev z vidika učitelja razrednika oz. učiteljice razredničarke

Vedenjske težave (domene)	**Trditev**	**Ocene učiteljev** PV/SO	**Vsota ocen učenci** PV/SO	**Vsota ocen učenke** PV/SO	**Vsota ocen skupaj[2]** PV/SO
Težave pozunanjenja	Se pretepa z drugimi.[1]	0,36/0,56	3,47/3,27	1,63/2,28	2,53/2,94**
	Grozi ali napada druge.	0,25/0,50			
	Se krega z drugimi.	0,65/0,67			
	Ugovarja odraslim, ko je opozorjen na vedenje.	0,45/0,62			
	Se hitro ujezi.	0,55/0,68			
	Ima izbruhe besa.	0,26/0,52			
Težave ponotranjenja	Ima nizko mnenje o samem sebi.	0,50/0,61	3,00/2,70	2,61/2,58	2,80/2,64**
	Izgleda osamljen.	0,43/0,60			
	Ko je v skupini otrok, je bojazljiv.	0,38/0,57			
	Ga je mogoče hitro spraviti v zadrego.	0,70/0,61			
	Rad je sam.	0,43/0,57			
	Deluje žalostno ali depresivno.	0,37/0,55			
Hiperaktivnost	Se zlahka zmede.	0,68/0,63	3,87/3,06	2,20/2,24	3,02/2,80**
	Prekinja pogovore drugih.	0,51/0,66			
	S svojim početjem moti dejavnosti.	0,49/0,68			
	Ne posluša nasvetov drugih.	0,60/0,61			
	Deluje impulzivno.	0,41/0,63			
	Izraža živčnost oz. se pretirano premika.	0,33/0,58			

Legenda:

PV – povprečna vrednost, SO – standardni odklon; [1] trditve so bile ocenjevane na intervalni lestvici: 0 – vedenje se nikoli ne pojavi, 1 – vedenje se včasih pojavi, 2 – vedenje se pojavlja zelo pogosto; [2] vsota ocen je bila izračunana na osnovi seštevka prejetih ocen za vse ocenjevane trditve na posamezni domeni vedenjskih težav;** razlike med spoloma so statistično značilne p ≤ 0,010 (dvostranski t-test za neodvisne vzorce).

Tabela 4 prikazuje ocenjevane standardizirane trditve, s katerimi so razredniki oz. razredničarke presojale vedenjske težave otrok na področju pozunanjenja, ponotranjenja in hiperaktivnosti. Glede na vsoto prejetih ocen na posamezni domeni vedenjskih težav prevladujejo težave na področju hiperaktivnosti (3,02), sledijo težave pozunanjenja (2,80) in ponotranjenja (2,53). Ocene vedenjskih težav so na vseh treh domenah pokazale povprečno prisotnost težav po kriterijih standardiziranega testa (Gresham in Elliott, 1990). Oboji, učenke in učenci, v drugem vzgojno-izobraževalnem obdobju osnovne šole najbolj izkazujejo naslednja nezaželena vedenja: ne poslušajo nasvetov drugih (0,60), se kregajo z drugimi (0,65), se zlahka zmedejo (0,68) in jih je mogoče hitro spraviti v zadrego (0,70). Med učenkami in učenci obstajajo statistično značilne razlike v pojavnosti vedenjskih težav ($p \leq 0{,}010$). Dečki v primerjavi z deklicami izkazujejo večjo prisotnost težav hiperaktivnosti, pozunanjenja in ponotranjenja.

V nadaljevanju nas je zanimalo, ali obstajajo povezave med pojavnostjo vedenjskih težav otrok in njihovo gibalno/športno aktivnostjo po pogostnosti, intenzivnosti, obliki in vsebini. V analizo smo vključili ordinalne in numerične spremenljivke, zato smo uporabili izračun neparametričnega Spearmanovega koeficienta ranga korelacije.

Rezultati v tabeli 5 kažejo, da je gibalno/športno udejstvovanje s 14 statistično značilnimi povezavami najbolj povezano z obvladovanje težav ponotranjenja, na katere ima pozitiven vpliv pogostnost in intenzivnost otrokove gibalne/športne aktivnosti, pogostnost samostojne gibalne/športne aktivnosti, vključenost v organizirane interesne gibalne/športne dejavnosti, ki se izvajajo na šoli in izven, kot je športni klub, obdobje vključenosti v organizirano vadbo, ukvarjanje s hojo, kolesarjenjem, planinarjenjem, nogometom in plesom, gibalno/športno udejstvovanje v družbi prijateljev ter gibalna/športna aktivnost mater. Na drugi strani pa se je gibalna/športna neaktivnost, kot je na primer pogostnost potovanja z avtobusom, pokazala za povezano z večjo pojavnostjo težav ponotranjenja ($p = 0{,}05$).

Težave pozunanjenja so pokazale šest in težave hiperaktivnosti pet povezav z gibalno/športno aktivnostjo. Za njihovo obvladovanje je pomembno udejstvovanje v plesnih aktivnostih. Več vedenjskih težav pozunanjenja in hiperaktivnosti izkazujejo otroci, ki so bolj intenzivno gibalno/športno aktivni, se pogosteje ukvarjajo z nogometom in rolanjem ter se udejstvujejo v družbi prijateljev.

Tabela 5. Ugotavljanje razlik v pojavnosti vedenjskih težav pri učenkah in učencih v osnovni šoli glede na njihovo gibalno/športno aktivnost

Značilnost gibalne/športne aktivnosti v prostem času	**Težave pozuna-njenja**	**Težave ponotra-njenja**	**Hiper-aktivnost**	**Skupna ocena težav**
	ro	ro	ro	ro
Pogostnost	0,039	–0,075**	0,032	0,003
Intenzivnost	0,120**	–0,126**	0,080**	0,035
Oblika – sam doma	–0,007	–0,053*	–0,019	–0,032
Oblika – gibanje v družini	–0,029	–0,040	–0,031	–0,042
Oblika – gibanje s prijatelji	0,065*	–0,053*	0,053*	0,027
Oblika – šolski športni krožek	–0,029	–0,089**	–0,038	–0,067*
Oblika – športni klub	0,081**	–0,168**	0,034	–0,021
Trajanje organizirane vadbe	0,046	–0,090*	0,058	0,015
Gibalna/športna aktivnost mater	–0,013	–0,061*	–0,003	–0,030
Gibalna/športna aktivnost očetov	–0,039	–0,034	–0,042	–0,044
Nogomet	0,070**	–0,052*	0,074**	0,039
Kolesarstvo	–0,027	–0,119**	–0,034	–0,077**
Hoja	0,023	–0,085**	0,046	–0,010
Ples	–0,076**	–0,066*	–0,104**	–0,114**
Rolanje	0,088**	–0,018	0,068*	0,064
Tek	0,005	–0,035	0,012	–0,009
Plavanje	–0,032	–0,005	–0,003	–0,019
Rokomet	–0,036	0,023	–0,039	–0,029
Planinarjenje	–0,027	–0,077*	–0,033	–0,057
Badminton	–0,006	–0,049	0,006	–0,015
Košarka	–0,038	0,002	–0,045	–0,043
Prihod v šolo – hoja	0,023	0,012	0,029	0,022
Prihod v šolo – kolesarjenje	0,029	0,041	0,033	0,036
Prihod v šolo – avtobus	0,019	0,056*	0,036	0,052*
Prihod v šolo – avtomobil	–0,040	–0,024	–0,024	–0,034
Število ur sedenja/dan med tednom	0,027	–0,003	0,024	0,019
Število ur sedenja/dan ob koncu tedna	–0,026	–0,039	–0,038	–0,042

Legenda:
ro – Spearmanov koeficient ranga korelacije; * raven statistične značilnosti ≤ 0,05 > 0,01; ** raven statistične značilnosti ≤ 0,01.

Skupna ocena težav je poudarila pozitivne povezave med gibalno/športno aktivnostjo in manjšo prisotnostjo vedenjskih težav zlasti ob vključenosti v organizirane interesne gibalne/športne dejavnosti v šoli, ukvarjanju s kolesarstvom in plesom ter zmanjšanju sedečih načinov prevoza v šolo.

Razprava

Izvedena raziskava na reprezentativnem vzorcu slovenskih učenk in učencev drugega vzgojno-izobraževalnega obdobja osnovne šole je pokazala, da so gibalno/športno aktivni v skladu s smernicami Svetovne zdravstvene organizacije (WHO, 2020). Skoraj polovica anketirancev je poročala, da je ob redni šolski športni vzgoji v prostem času gibalno/športno aktivna vsak dan, dve tretjini anketirancev pa večino dni v tednu.

Za pozitivne učinke na zdravje je ob pogostnosti gibalne/športne aktivnosti pomembna tudi njena intenzivnost. Svetovna zdravstvena organizacija priporoča pri otrocih in mladostnikih od 5. do 17. leta starosti srednje do visoko intenzivno gibalno/športno aktivnost, pri čemer se izvedba visoko intenzivne vadbe priporoča vsaj trikrat na teden (WHO, 2020). Ugotovitve naše raziskave kažejo, da je dobra polovica anketiranih učenk in učencev v prostem času srednje intenzivno in več kot tretjina visoko intenzivno gibalno/športno aktivna. Visoko intenzivna vadba je v večji meri prisotna pri dečkih. Priporočilom ni zadostila vsaj desetina anketiranih, med katerimi prevladujejo deklice, ki so se opredelile za nizko intenzivno aktivne. V prihodnjih raziskavah velja proučiti intenzivnost gibalne/športne aktivnosti v povezavi z njeno pogostnostjo ter tako natančno oceniti delež deklic in dečkov, ki ne zadostijo pogoju visoko intenzivnega gibalne/športnega udejstvovanja vsaj trikrat na teden.

Rezultati naše raziskave so pokazali, da je pomanjkanje gibalne/športne aktivnosti najmočnejši napovedovalec vedenjskih težav na področju ponotranjenja, kot so občutki anksioznosti, žalosti, osamljenosti, depresije in nizke samopodobe. Vedenjske težave ponotranjenja predstavljajo težave posameznika s samim seboj kot tudi z okoljem, v katerem živi (Kobolt, 2011). Naša raziskava je pokazala, da več kot je otrok gibalno/športno aktiven, boljše je njegovo obvladovanje težav ponotranjenja, pri tem sta zlasti pomembni pogostnost in intenzivnost katere koli oblike prostočasne gibalne/športne aktivnosti.

Vplivno vlogo na obvladovanje tovrstnih vedenjskih težav pa imajo po ugotovitvah naše raziskave tudi športne aktivnosti, ki se izvajajo v organizirani obliki, gibalna/športna aktivnost mater, gibalne/športne aktivnosti v naravi (npr. hoja, kolesarjenje, planinarjenje), vadba plesa in omejevanje sedečih načinov prevoza v šolo.

Izsledki sorodnih študij pojasnjujejo, da ugodna predstava o sebi zmanjšuje anksioznost ter je povezana z večjo uspešnostjo na učnem in gibalnem/športnem področju, večjo zavzetostjo za vadbo ter s tem z vzdrževanjem zdravju koristne psihofizične pripravljenosti (Dolenc, 2010). Zato je pomembno, da prepoznamo vedenjske težave ponotranjenja pri učenkah in učencih ter jih vključimo v intervencije za spodbujanje gibalne/športne aktivnosti. Na podlagi ugotovitev te študije priporočamo, da intervencije poleg otrok naslavljajo tudi na njihove starše, zlasti matere, ter s tem spodbujajo raven gibalne/športne aktivnosti v celotni družini. Raziskava Ng s sodelavci (2017) je podala ugotovitve, da redna gibalna/športna aktivnost ublaži kognitivne, vedenjske in telesne simptome hiperaktivnosti, pri čemer naj bi imele največji vpliv ravno raznovrstne gibalne/športne vadbe, tj. od srednje do visoke intenzivnosti ter aerobnega značaja. Zmerni do velik vpliv gibalne/športne aktivnosti na spremembo razpoloženja pri otrocih z motnjo hiperaktivnosti pripisujejo tudi Colleen, Fedewa in Ahn (2017). V nasprotju z navedenimi spoznanji pa ugotovitve naše raziskave kažejo, da se vedenjske težave na področju pozunanjenja in hiperaktivnosti, kot so verbalna ali fizična agresivnost proti drugim, šibka samokontrola in prepiranje, pozitivno povezujejo z večjo intenzivnostjo in organiziranostjo gibalne/športne aktivnosti v prostem času. Možna razlaga je, da se otroci z več vedenjskimi težavami v razredu udeležujejo bolj intenzivnih gibalnih/športnih vadb. Na drugi strani pa ugotovitve porajajo vprašanje, kako učitelji oz. učiteljice dojemajo visoko gibalno/športno aktivne otroke v svojem razredu oz. kakšna je njihova presoja otrokovih vedenjskih težav, saj so nezaželena vedenja pozunanjenja in hiperaktivnosti, ki so bolj izrazita pri dečkih, prej zaznana in manj tolerirana.

Sklep

Izvedena raziskava potrjuje pomembno vlogo rednega gibalnega/športnega udejstvovanja pri obvladovanju vedenjskih težav pri učenkah in učencih v osnovni šoli, zlasti na področju težav ponotranjenja.

Potrebne so nadaljnje raziskave, ki bodo proučile razlike v pojavnosti vedenjskih težav v različnih okoljih ter vpliv drugih dejavnikov, ki so ob gibalni/športni aktivnosti pomembni za otrokov socialni razvoj in obvladovanje nezaželenih vedenj, kot so demografske značilnosti, ekonomski status, razvojni primanjkljaji, šolska klima ter učna uspešnost.

Summary

Many factors influence behaviour problems in elementary school students. Studies (Smith and Smoll, 1991; Ekeland et al., 2004; Vahedi et al., 2012; Lee and Jeoung, 2016) have proven beyond doubt that physical/sporting activities have a significant impact on a child's socialisation, accumulation of social capital and coping with deviant behaviour in school. However, little is known about which characteristics of physical/sporting activities are most strongly associated with the management of behaviour problems. Given this gap, our purpose in this study was to examine which components of leisure-time physical/sporting activities were most strongly associated with the occurrence of behaviour problems such as internalising, externalising and hyperactivity. The focus of our study was on school children in the second triad of education in Slovenian elementary school.

This study was conducted as a non-experimental empirical survey using a self-assessment questionnaire about students' physical/sporting activities, and a standardised test of the Social Skills Rating System (SRSS) (Gresham and Elliott, 1990) to assess behaviour problems in the classroom. The SSRS measures the degree of behaviour problems in three key domains: 1) internalising problems, 2) externalising problems and 3) hyperactivity problems. The instrument includes 18 items rated on a 3-point scale: 0 - behaviour does not occur, 1 - behaviour occurs occasionally, 2 - behaviour occurs very frequently. A representative sample of 1782 pupils (52% girls, 48% boys) of the second educational triad from 16 Slovenian elementary schools participated in the study. The average age of the sample was 10.4 ± 0.93 years. The occurrence of behaviour problems in the classroom was assessed by their classroom teachers (n = 129, 89.1% female). Their teaching experience averaged 18 ± 1.18 years. Descriptive statistics and bivariate tests (two-sided t-test, chi-square test, Spearman's correlation) were used for data analysis.

The results showed that a lack of physical/athletic activity is the strongest predictor of internalising behaviour problems such as low self-esteem, anxiety, feelings of sadness, loneliness, and depression. In this context, the frequency and intensity of physical/sporting activity, extracurricular sports activities, mothers' physical activity, dancing and limiting the amount of time children spend sedentary while travelling to a school all have an important role.

In addition, physical/sporting activity was found to be statistically significantly related to externalising problems and hyperactivity, and to increase with a sedentary mode of travel to school and their intensity. In this case, engaging in dance was also the strongest predictor of coping with behaviour problems at school.

The study found that while externalising behaviour problems, such as verbal and physical aggression towards others, weak self-control and quarrels, and student hyperactivity, was more evident in class; internalising behaviour problems were more likely to benefit from extracurricular physical/sporting activities. Therefore, physical/sporting interventions should be designed and implemented in school for students with recognised internalising behaviour problems. Based on the findings of this study, interventions should target not only children but also their parents, especially mothers, and aim to increase their physical/sporting activity. In addition, further studies should examine more closely the positive correlations between hyperactivity and externalising behaviour problems with intensity and organised physical/sporting activities, such as rollerblading and football. One possible explanation is that children with more behaviour problems participate in more intense physical/sporting activities. However, this aspect should be taken into account when further considering how a variety of physical/sporting activities could be used to address these types of behaviour problems in primary schools, especially among boys. Indeed, our findings raise the interesting question of why higher levels of physical/sporting activity among boys are not associated with fewer behaviour problems. On the contrary, boys appear to be at higher risk for behaviour problems compared to girls. It seems that other factors besides leisure time physical/sporting activity might influence behaviour in the classroom, and this deserves further comprehensive investigation.

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REVIJA ZA ELEMENTARNO IZOBRAŽEVANJE
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POUK ŠPORTA NA DALJAVO ZA MLAJŠE UČENCE IN UČENKE MED EPIDEMIJO COVID-19 V SLOVENIJI

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Izvleček/Abstract

Cilj raziskave je bil preučiti, kako je potekala izvedba ure športa med šolanjem na daljavo v Sloveniji. Rezultati potrjujejo slabšo kakovost in krajše izvedbe ure športa med šolanjem na daljavo. Z našimi ugotovitvami sovpadajo tudi ugotovitve drugih, da so se med pandemijo COVID-19 drastično zmanjšale gibalna/športna aktivnost (G/ŠA) otrok in njihove gibalne sposobnosti. Ta študija podaja jasne odgovore vsem odgovornim deležnikom, da šolanje na daljavo ni primeren ukrep s stališča zagotavljanja pogojev zdravega razvoja otrok.

Ključne besede:
COVID-19, otroci, izolacija, telesna aktivnost, pouk športa

Distance Learning for Young Students During the Covid-19 Epidemic in Slovenia

The aim of the study was to investigate how physical education classes were conducted during remote schooling. The results confirm the poorer quality and duration of physical education classes during remote schooling. Our findings also coincide with the findings of other studies, which show that during the COVID-19 pandemic, children's physical/sports activity, as well as their motor functions, decreased dramatically. This study provides clear answers to all responsible stakeholders that remote schooling is not an appropriate measure from the point of view of ensuring the conditions for healthy development of children.

Keywords:
COVID-19, children, isolation, physical activity, physical education

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Uvod

Pandemija je zaradi novega korona virusa (COVID-19) od začetka pomembna zaradi zdravstvenih izzivov za prebivalstvo po vsem svetu, zaradi upoštevanja posebnih epidemioloških kontekstov, še posebej pa obolevnosti in umrljivosti. Svetovna zdravstvena organizacija (WHO) je 30. januarja 2020 uradno razglasila incident s COVID-19 kot mednarodno nevarnost za javno zdravje. COVID-19 je prizadel več kot 200 držav in regij po vsem svetu, skupaj 28,871.176 potrjenih bolnikov in skupaj več kot 921.801 smrti do 15. septembra 2020 (Zhang idr., 2020). Za zajezitev širjenja bolezni (CoViD-19) so številne vlade sprejele zelo odzivne ukrepe, ki so imeli tudi pomembne telesne in psihološke posledice za posameznike (Galle idr., 2020). Ker do danes zoper COVID-19 še ni učinkovitega zdravljenja, so bili uvedeni strogi preventivni ukrepi, kot so pogosto umivanje rok, ohranjanje fizične razdalje, omejitve gibanja in nošenje obraznih mask. Po priporočilu WHO je večina držav izvajala politike omejevanja gibanja za vse državljane razen za nujne storitve, potrebne za večinski delež prebivalstva (Violand-H. idr., 2020). Med ukrepe omejevanja gibanja so bili sprejeti ukrepi začasnega prenehanja izobraževanja (zaprtje šolskih ustanov) ter izvajanja športnih dejavnosti.

Redna gibalna/športna aktivnost (G/ŠA) velja za ključno aktivnost zdravega načina življenja in preprečevanja bolezni. Prav tako pomaga ohranjati primerno telesno maso, zmanjšuje tveganje za razvoj debelosti in krepi imunski sistem, obratno pa gibalna neaktivnost povečuje tveganje za številne kronične bolezni, kot so visok krvni pritisk, koronarna bolezen srca, možganska kap, sladkorna bolezen, depresija in povečana nevarnost padcev. Otroci, ki so dovolj redno G/Š aktivni, imajo tudi boljše samospoštovanje, samopodobo, so manj podvrženi stresnim situacijam, so boljše socialno integrirani, zaznava se boljši razvoj možganov, se lažje učijo in dosegajo boljše učne rezultate (Hillman idr., 2008; Planinšec, Fošnarič, 2005; Eime idr., 2013; Strong idr., 2005; Warburton, Bredin, 2019). Čeprav sta fizična izolacija in omejevanje G/ŠA učinkovita ukrepa za boj proti širjenju novega koronavirusa, pa je vseeno omejevanje oziroma celo prepoved G/ŠA vodila v spremembo načina življenja številnih ljudi (Barbarro idr. , 2020, Pišot idr. 2020). Nedavne evropske in svetovne primerjalne študije poročajo, da so ukrepi omejevanja gibanja močno vplivali na življenjski slog ljudi, saj so poročali o porastu neaktivnosti do 50 % (s 5,5 ure na 8,5 ure dnevno), o podaljšanem času,

prebitem pred zaslonom (65 %), to pa na drugi strani pomeni zmanjševanje gibalne aktivnosti; hoje (43 %) ter športnih aktivnosti (24 %). V določeni meri je prišlo tudi do sprememb v prehranskih praksah, tj. pogostejše uživanje nezdrave prehrane (tj. hitra, kalorična prehrana ter prehranjevanje brez nadzora), v duševnem zdravju (tj. strah pred okužbo, osamljenost) ter v slabši kakovosti spanja (Pišot idr. 2020, Amar idr. 2020, Lo Coco idr. 2020, Clay, Parker, 2020). Vzporedno pa je zaskrbljujoče, da upadata količina in intenzivnost G/ŠA kronološko in s starostjo otrok. Zavedati se moramo tudi porasta gibalne neaktivnosti, ki jo je treba obravnavati kot samostojen dejavnik našega zdravja. In gibalna neaktivnost je med mladimi bistveno večja kot pri odraslih (Osipov idr., 2021).

Znano je, da mladi več časa preživijo ob elektronskih napravah kot druge starostne skupine, to pa je povezano z več zdravstvenimi tveganji v odrasli dobi. Dognano je, da sedeč način življenja med mladimi narašča, to pa je povezano s številnimi nezdravimi posledicami. Pomanjkanje telesne dejavnosti je velika grožnja tudi za kognitivno zdravje tako pri mladih kot tudi pri odraslih. Znanstveniki navajajo, da so dobro vidni pozitivni učinki G/ŠA na kognitivne rezultate in akademski uspeh pri mladih in odraslih. Nekateri ruski raziskovalci pa v zadnjem času kljub vsemu navajajo pozitivne trende vključevanja v redne G/ŠA vseh starostnih skupin. Zaključuje, da število posameznikov, ki se redno ukvarja s telesno aktivnostjo, vsako leto narašča (Osipov, et.al., 2021).

Zaradi zaprtja šol otroci in mladostniki niso bili več deležni organizirane oblike G/ŠA, kot je šolska ura športa, in sicer znotraj in izven šolske športne aktivnosti ter klubskega športa. Otroške, mladinske in članske ekipne športne lige so odpovedale vse treninge in tekmovanja (Kovacs idr., 2021). Tudi novi načini vzgojno-izobraževalnih procesov so pripeljali do večjih prilagoditev glede dela na daljavo. Nove oblike dela so dodatno zmanjšale nivo interakcij med učenci/učenkami, dijaki/dijakinjami in študenti/študentkami, nivojem G/ŠA ter posledično primernim psihofizičnim statusom. Velik del vzgojno-izobraževalnih sistemov na takšne izzive ni bil pripravljen. Spletno izobraževanje (učenje na daljavo) je hitro postalo priljubljena metoda dela, ki jo uporabljajo na vseh nivojih izobraževanja širom po svetu za uresničitev potreb, ki so bile onemogočene zaradi fizičnega distanciranja med pandemijo COVID-19.

Izvedba šolanja na daljavo je predstavljala velik izziv, saj so bili učitelji/učiteljice in otroci na ta način dela popolnoma nepripravljeni.
To velja tako v didaktičnem smislu kot tudi z vidika potrebne IKT-podpore. Še posebej pa se je kot problematično pokazalo izvajanje pouka športa na daljavo. Razlogi so v tem, da otroci za izvajanje mnogih aktivnosti, ki jih predvideva učni načrt, doma nimajo osnovnih pogojev, predvsem prostora in športne opreme. Poleg tega doma ni mogoče izvajati skupinskih aktivnosti. Praviloma se lahko pouk športa na daljavo izvaja 'v živo' preko video klica ali pa s podajanjem navodil po spletu v pisni, slikovni, zvočni ali video obliki. Leta 2020 so bila v Sloveniji izdelana okvirna priporočila za izvajanje pouka športa na daljavo (Jurak idr., 2020)
Nobena raziskava še ne poroča o izvedbi ur športa na daljavo, čeprav opažamo velike spremembe življenjskega sloga ter gibalnih sposobnosti otrok. Zato je bil naš cilj raziskati način izvedbe ure športa na reprezentativnem vzorcu 6–12-letnih osnovnošolskih otrok v Sloveniji. V nadaljevanju smo primerjali način izvedbe ur športa med otroki v mestnem okolju in na podeželju.

Metode

Preiskovanci

V okviru raziskovalnega programa Inštituta za kineziološke raziskave Znanstveno-raziskovalnega središča Koper (ZRS Koper) pod vodstvom prof. dr. Rada Pišota in partnerske inštitucije Pedagoške fakultete Univerze v Mariboru (PEF UM) je bil pripravljen spletni anketni vprašalnik o GŠ/A, počutju ter prehranskih navadah osnovnošolskih otrok. Anketa je bila namenjena staršem otrok, starih 6–12 let (starost: 8,81 ± 1,46 let), tj. od 2. do 5. razreda osnovnih šol iz vseh regij Slovenije. Starši ali skrbniki so se v uvodnem delu seznanili s cilji in z namenom raziskave ter da bodo vsi podatki obdelani in hranjeni z upoštevanjem določb veljavne zakonodaje na področju varstva osebnih podatkov in Splošne uredbe o varstvu osebnih podatkov (angl. General Data Protection Regulation – GDPR). Odgovori so bili anonimizirani in se hranijo za raziskovalne namene v arhivih izvajalcev PEF UM in ZRS Koper. Raziskavo »OTROCI IN UKREPI V ČASU EPIDEMIJE COVID-19« je odobrila Etična komisija Znanstveno-raziskovalnega središča Koper (št. 0624-13/21, dne 2. 2. 2021).

Raziskovalni načrt

Časovni okviri raziskave se nanašajo na obdobje pred izbruhom epidemije (12. 3. 2020) in časovnim obdobjem odrejenih ukrepov za zajezitev epidemije COVID-19 za šolanje na domu. Anketa je bila izvedena med 23. 12. 2020 in 15. 1. 2021 (24 dni). Povabilo za raziskavo s podrobnejšo razlago, namenjeno ravnateljem in staršem, je vsem ravnateljem osnovnih šol posredoval generalni direktor direktorata za predšolsko vzgojo in osnovno šolstvo Ministrstva za izobraževanje, znanost in šport. Prav tako je raziskovalna skupina poslala povabila na interne adreme osnovnih šol in staršev.

Do zaključka raziskave je bilo na nagovor kot tudi na anketo prejetih 5282 klikov, nadalje se je kar 4737 (90 %) staršev oz. skrbnikov odločilo za izpolnjevanje ankete, to pa pomeni visoko stopnjo odzivnosti. V nadaljnjo analizo je bilo zajetih 3665 (69 %) vprašalnikov, ki so bili izpolnjeni v celoti.

Vprašalnik

Vprašalnik je sestavljen vprašalnik, prilagojen za spletno objavo, in sicer vsebuje: socio-demografski del, katerega namen je pridobitev osnovnih demografskih podatkov otroka in se nanaša na trenutno stanje otroka in družine; standardiziran vprašalnik IPAQ (angl. International Physical Activity Questionaire-Short Form – IPAQ-SF) (Lee idr., 2011) za zajem G/ŠA, standardiziran vprašalnik HRQOL (angl. Questionnaire for Measuring Health-Related Quality of Life in Children and Adolescents) (KINDLE-R) (Ravens-Sieberer, U., in Bullinger, M., 2000) za proučevanje otrokovega počutja. Za potrebe pridobitve podatkov o izvedbi pouka športa v šoli so bila vprašalniku dodana vprašanja: o obiskovanju pouka športa pred ukrepi COVID-19, ki so začasno prepovedovali zbiranje ljudi v zavodih s področja vzgoje in izobraževanja, ter o izvedbi pouka športa v obdobju šolanja na daljavo (priloga/tabela). Sodelovanje v spletni anketi je bilo prostovoljno, od ankete pa so starši med izpolnjevanjem lahko tudi odstopili.

Metode obdelave podatkov

Podatke iz vprašalnika smo obdelali s pomočjo programa SPSS, verzija 27. Izračunane so bili frekvence (f) in odstotki (f %). Test hi-kvadrat je bil uporabljen za analizo razlik v izvedbi pouka športa med šolami iz mestnega okolja in podeželja. Statistično pomembnost razlik smo ugotavljali na ravni tveganja $p < 0,05$. Dobljeni rezultati so predstavljeni tabelarično in grafično.

Zasebnost podatkov

Starši ali skrbniki kot udeleženci ankete so bili v uvodnem delu seznanjeni, da bodo vsi podatki obdelani in upravljani z upoštevanjem določb veljavne zakonodaje na področju varstva osebnih podatkov in Splošne uredbe o varstvu osebnih podatkov. Odgovori udeležencev so bili anonimni in zaupni. Anketni vprašalnik ne vključuje zbiranja osebnih podatkov (imen, datuma rojstva ali drugih kontaktnih podatkov), ki bi lahko omogočili identifikacijo anketiranca. Prav tako ne vključuje etično in moralo spornih vprašanj.

Soglasje etične komisije

Raziskava »OTROCI IN UKREPI V ČASU EPIDEMIJE COVID-19« skupaj z vprašalnikom je dobila 2. 2. 2021 etično dovoljenje Etične komisije pri Znanstveno-raziskovalnem središču Koper, št. 0624-13/21.

Rezultati

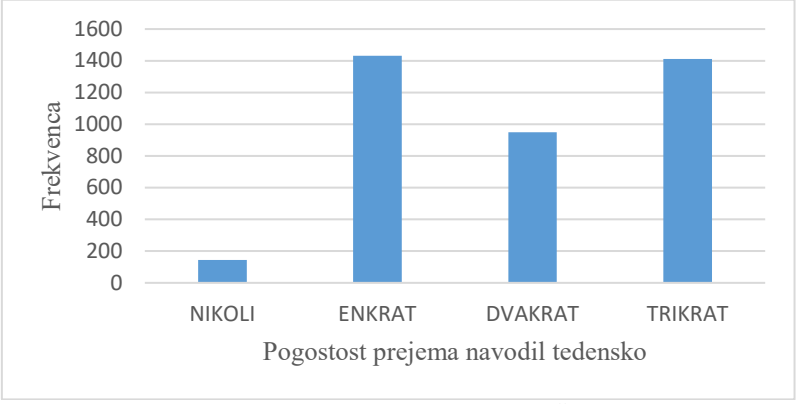
Vprašalnik o G/ŠA je v celoti izpolnilo 3936 staršev otrok, med katerimi je bilo 2070 (52,6 %) dečkov in 1866 (47.4 %) deklic. Starostni razpon otrok je bil 6–12 let (tabela 1). Sodelujoči so bili iz vseh dvanajstih slovenskih regij.

Tabela 1. Demografske značilnosti otrok v vzorcu

Spremenljivke	**Demografske značilnosti**	**N**	**%**
Spol	Moški	2070	52,6
	Ženske	1866	47,4
Starost (leta)	6	79	2,0
	7	781	19,8
	8	939	23,9
	9	829	21,1
	10	870	22,1
	11	191	4,9
	12	247	6,3
Število članov gospodinjstva	2	111	2,8
	3	668	17,0
	4	2108	53,6
	5	753	19,1
	6	219	5,6
	> 6	77	2,0
Regije	1 Gorenjska	259	6,6
	2 Goriška	276	7,0

	3 Jugovzhodna Slovenija	354	9,0
	4 Koroška	146	3,5
	5 Obalno-Kraška	210	5,3
	6 Osrednjeslovenska	895	22,7
	7 Podravska	489	12,4
	8 Pomurska	343	8,7
	9 Posavska	153	3,9
	10 Primorsko-Notranjska	216	5,5
	11 Savinjska	433	11,0
	12 Zasavska	162	4,1

Za izvedbo ure športa med šolanjem na daljavo so otroci najpogosteje dobili navodila po spletu enkrat tedensko (f = 1431; 36,4 %), nekoliko manj (f = 1412; 35,9 %) trikrat tedensko, medtem ko 144 (3,7 %) otrok nikoli ni prejelo navodil po spletu (graf 1). V nadaljevanju smo primerjali odgovore otrok iz mesta in s podeželja (tabela 1) ter ugotovili razlike v frekvenci podajanja navodil (χ^2 = 47,74; p = 0,001). Učitelji/učiteljice na podeželju so podali navodila trikrat tedensko, tj. 853 (39,6 %), kar pomeni pogosteje kot učitelji/učiteljice mestnih šol, 559 (31,4 %). Nasprotno pa ni dobilo navodil 87 (4,9 %) otrok mestnih šol in 57 (2,6 %) otrok podeželskih šol. Rezultati torej kažejo, da so navodila za pouk športa pogosteje dobivali otroci podeželskih šol.



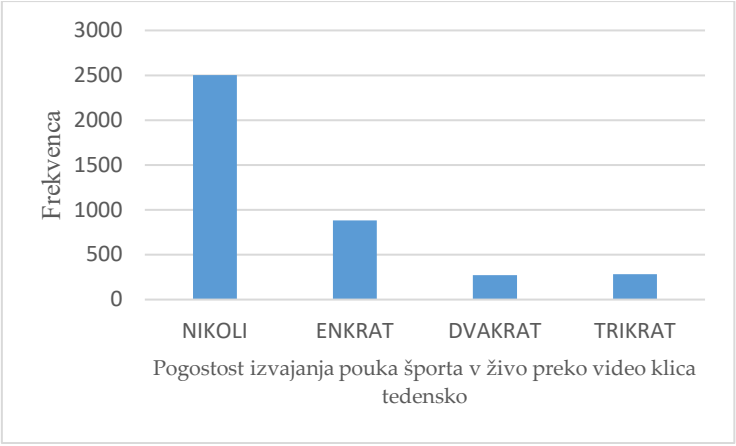
Graf 1. Frekvenca prejema navodil po spletu za pouk športa tedensko

Tabela 2. Kontigenčna tabela s primerjavo frekvenc (f) in odstotkov (f %: znotraj istega okolja; med okoljema) prejema tedenskih navodil učitelja/učiteljice športa za pouk športa med mestom in podeželjem na teden

Navodila po spletu za pouk športa tedensko	Mesto		Podeželje		Skupaj	
	f	**f %**	**f**	**f %**	**f**	**f %**
Nikoli	87	4,9; 60,4	57	2,6; 39,6	144	3,7; 100
Enkrat	721	40,5; 50,4	710	33,0; 49,6	1431	36,4; 100
Dvakrat	415	23,3; 43,7	534	24,8; 56,3	949	24,1; 100
Trikrat	559	31,4; 39,6	853	39,6; 60,4	1412	35,9; 100
Skupaj	1782	100; 45,3	2154	100; 54,7	3936	100; 100

$\chi^2 = 47{,}74$; $p = 0{,}001$

Kar 2502 (63,3 %) otrok ni nikoli imelo pouka športa 'v živo' preko video klica, 881 (22,4 %) jih je imelo tak pouk enkrat, 271 (6,9 %) dvakrat in 282 (7,2 %) trikrat tedensko (graf 2). Ugotovili smo razlike med mestnim okoljem in podeželjem ($\chi^2 = 61{,}62$; $p = 0{,}001$). Med otroki mestnih šol jih 1016 (57,0 %) ni imelo pouka preko video klica, med otroki podeželskih šol pa je bilo takih kar 1486 (69,0 %). Enkrat tedensko je imelo takšen pouk 465 (26,1 %) otrok mestnih šol in 416 (19,3 %) otrok podeželskih šol. Dvakrat tedensko je imelo pouk športa preko video klica 142 (8,0 %) otrok mestnih šol in 129 (6,0 %) otrok podeželskih šol. Trikrat tedensko je imelo takšen pouk 159 (8,9 %) otrok mestnih šol in 123 (5,7 %) otrok podeželskih šol. Na osnovi rezultatov ugotavljamo, da se je pouk športa preko video klica pogosteje izvajali v mestnih šolah.



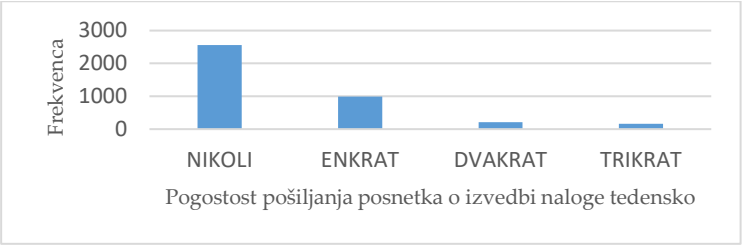
Graf 2. Frekvenca izvedbe pouka športa preko video klica

Tabela 3. Kontigenčna tabela s primerjavo frekvenc (f) in odstotkov (f %: znotraj istega okolja; med okoljema)) izvedbe pouka športa preko video klica med mestom in podeželjem na teden

Pouk športa preko video klica tedensko	Mesto		Podeželje		Skupaj	
	f	f %	f	f %	f	f %
Nikoli	1016	57,0; 40,6	1486	69,0; 59,4	2502	63,6; 100
Enkrat	465	26,1; 52,8	416	19,3; 47,2	881	22,4; 100
Dvakrat	142	8,0; 52,4	129	6,0; 47,6	271	6,9; 100
Trikrat	159	8,9; 56,4	123	5,7; 43,6	282	7,2; 100
Skupaj	1782	100; 45,3	2154	100; 54,7	3936	100; 100

$\chi^2 = 61{,}62$; $p = 0{,}001$

Kar 2564 (65,1 %) otrok oziroma staršev ni nikoli pošiljalo učiteljem/učiteljicam posnetkov izvedbe gibalnih nalog pouka športa (graf 3). Med otroki, ki so posnetke pošiljali, jih je največ poslalo enkrat (f = 989; 25,1 %), sledijo otroci, ki so jih poslali dvakrat (f = 216; 25,1 %), najmanj pa je otrok, ki so jih poslali trikrat (f = 167; 4,2 %). Med otroki mestnega okolja in podeželja nismo ugotovili razlik v pošiljanju povratnih informacij ($\chi^2 = 7{,}33$; $p = 0.062$).



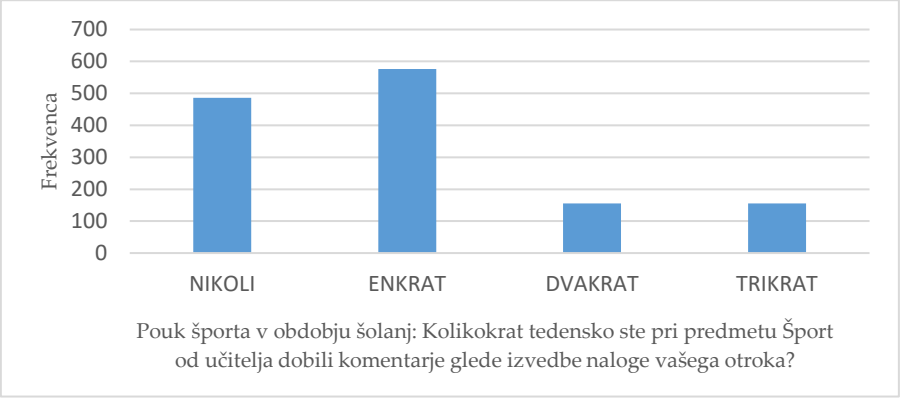
Graf 3. Frekvenca pošiljanja posnetka izvedbe gibalnih nalog učitelju/učiteljici

Tabela 4. Kontigenčna tabela s primerjavo frekvenc (f) in odstotkov (f %: znotraj istega okolja; med okoljema) pogostosti pošiljanja posnetka izvedbe učitelju/učiteljici med mestom in podeželjem na teden

Učitelju/učiteljici poslali posnetek izvedbe tedensko	Mesto		Podeželje		Skupaj	
	f	f %	f	f %	f	f %
Nikoli	1195	67,1; 46,6	1369	63,6; 53,4	2564	65,1; 100
Enkrat	428	24,0; 43,3	561	26,9; 56,7	989	25,1; 100
Dvakrat	96	5,4; 44,4	120	5,6; 55,6	216	5,5; 100
Trikrat	63	3,5; 37,3	104	4,8; 62,3	167	4,2; 100
Skupaj	1782	100; 45,3	2154	100; 54,7	3936	100; 100

$\chi^2 = 7{,}33$; $p = 0{,}062$

Od 1372 otrok, ki so vsaj enkrat tedensko pošiljali posnetek izvedbe gibalnih nalog učitelju/učiteljici, jih kar 486 (35,4 %) nikoli ni prejelo povratnih informacij, enkrat tedensko je prejelo informacije 576 (42 %) otrok, dvakrat 155 (11,3%) in tudi trikrat 155 (11,3 %) (graf 4). Iz tabele 5 je razvidno, da med otroki mestnih in podeželskih šol statistično pomembnih razlik nismo ugotovili (χ^2 = 3,21; p = 0,36). Enkrat tedensko je prejelo povratne informacije 244 (41,6 %) otrok mestnih šol in 332 (42,3 %) otrok podeželskih šol. Le 69 (11,8 %) otrok mestnih šol in 86 (11 %) otrok podeželskih šol je dobilo povratne informacije dvakrat. Trikrat tedensko je dobilo takšne informacije 57 (9,7 %) otrok mestnih in 98 (12,5 %) otrok s podeželja.



Graf 4: Frekvenca prejema povratnih informacij od učitelja/učiteljice

Tabela 5. Kontigenčna tabela s primerjavo frekvenc (f) in odstotkov (f %: znotraj istega okolja; med okoljema) prejema povratnih informacij od učitelja/učiteljice med mestom in podeželjem na teden

Povratne informacije od učitelja/učiteljice tedensko	**Mesto**		**Podeželje**		**Skupaj**	
	f	**f %**	**f**	**f %**	**f**	**f %**
Nikoli	217	37,0; 44,7	269	34,4; 55,3	486	35,4; 100
Enkrat	244	41,6; 42,4	332	42,3; 57,6	576	42,0; 100
Dvakrat	69	11,8; 44,5	86	11,0; 55,5	155	11,3; 100
Trikrat	57	9,7; 36,8	98	12,5; 63,2	155	11,3; 100
Skupaj	587	100; 42,8	785	100; 57,2	1372	100; 100

χ^2 = 3,21; p = 0,36

Diskusija

Ugotovili smo, da so 6–12-letni otroci le v 35,9 % dobili navodila za izvedbo vseh ur športa ter da 3,7 % otrok navodil ni prejelo nikoli. Zaskrbljujoče je, da kar 63,3 % otrok ni nikoli imelo pouka športa 'v živo' preko video klica in zgolj 7,2 % njih je izvedlo vse tedenske ure vodeno preko video klica. Ugotovili smo tudi, da je potekala izjemno slaba komunikacija med otroki in učitelji/učiteljicami športa, saj kar 65,1 % otrok oziroma staršev ni nikoli pošiljalo posnetkov izvedbe gibalnih nalog pouka športa; zgolj v 4,2 % je redno pošiljalo poročilo o izvedbi gibalnih nalog. Od teh otrok, ki so pošiljali poročila o izvedbi ure športa, od učitelja/učiteljice niso prejeli povratne informacije v 35,4 %.

Ta raziskava je ena prvih znanih študij, ki je preučila zgodnje učinke pandemije COVID-19 na G/ŠA med slovenskimi otroki, starimi 6–12 let, med zaprtjem države, in poukom športa na daljavo. Podatki so bili zbrani v 12 slovenskih regijah v obdobju 24 dni, in sicer od decembra 2020 do januarja 2021. Časovni okviri raziskave se nanašajo na obdobje pred izbruhom epidemije (12. 3. 2020) in odrejenimi ukrepi za zajezitev epidemije COVID-19 ter obdobjem, ko se je na državnem nivoju odredilo zaprtje javnega življenja in šolanje na domu. Posledično je prišlo do odpovedi ekipnih športov in tečajnih aktivnosti za mlade ter zaprtja javnih parkov in igrišč. Na splošno so starši zaznali, da se je G/ŠA otrok zmanjšala in se je povečal sedeči način preživljanja otrok med zgodnjim obdobjem COVID-19.

Tako lokacije kot tudi načini otroških G/ŠA so se v času zgodnjega obdobja COVID-19 drastično spremenili, in sicer z več otroki, ki izvajajo G/ŠA doma ali v garaži, na ulicah, dvoriščih in v njihovi soseščini. Zaskrbljujoči za javno zdravje so bili ukrepi z omejitvami gibanja in spremenjenimi vedenjskimi odzivi med COVID-19, saj so za marsikoga postali trajno ukoreninjeni, kar pa lahko vodi pri otrocih v kasnejših letih v povečano tveganje za debelost, sladkorno bolezen ter bolezni srca in ožilja.

V raziskavi nas je glede sprejetih ukrepov najbolj zanimal ukrep zajezitve in obvladovanja nalezljive bolezni COVID-19, ki je začasno prepovedoval zbiranje ljudi v zavodih s področja vzgoje in izobraževanja, na univerzah in samostojnih visokošolskih zavodih ter posledice glede izvajanja G/ŠA oz. pouka športa na daljavo v slovenskih osnovnih šolah.

Tovrstna izvedba športa na daljavo je v precejšnji meri presenetila učitelje/učiteljice na razredni stopnji kot tudi učitelje/učiteljice športne vzgoje. Tudi starši, ki so otrokom pomagali pri izvedbi pouka na daljavo, so bili v veliki meri na preizkušnji ob tudi svojih večjih delovnih prilagoditvah. Marsikatera družina je bila v tem času pouka na daljavo soočena s prostorsko stisko in problemom zagotavljanja določenih rekvizitov, ki so bili priporočeni v določenih gibalnih nalogah za razvoj gibalnih sposobnosti in spretnosti. Prav tako so odpadle vse tiste gibalne aktivnosti, kjer naj bi delovali v parih ali skupinah, kot so športne igre.

V raziskavi smo ločili otroke mestnih in podeželskih osnovnih šol. Pri vprašanju glede dobljenih navodil za izvajanje pouka športa na daljavo so v prednjačile podeželske šole in njihovi učitelji/učiteljice s statistično značilno razliko (0,001). To pomeni, da so v vseh intervalih posredovanja navodil za športne aktivnosti enkrat, dvakrat, trikrat tedensko posredovali le-te pogosteje. S tem se je v precejšnji meri pokazalo, da ima tudi večji del podeželja dobro internetno telekomunikacijsko omrežje.

Rezultati pri vprašanju o pouku športa preko video klica pa so pokazali statistično značilno razliko (0,001) v korist mestnih šol, a je ob tem treba izpostaviti, da kar 63,3 % vseh otrok v raziskavi nikoli ni imelo pouka športa preko video klica.

Pri preverjanju opravljenih nalog in upoštevanju navodil glede pouka športa na daljavo se pošiljanje posnetkov ni preveč obneslo, saj kar 65,1 % oz. 2564 vseh otrok od skupno 3936 nikoli ni poslalo posnetka opravljenih nalog. Statistično značilnih odstopanj med mestnimi in podeželskimi šolami ni bilo. Sicer pa so nekoliko prednjačili otroci podeželskih šol razen pri odgovoru *nikoli*.

Pri povratnih informacijah učiteljev/učiteljic glede na poslane posnetke o izvedbi pouka športa na domu se je pokazala statistično značilna razlika (0,004) med mestnimi in primestnimi šolami. Podeželske šole so bili uspešnejši pri pošiljanju komentarjev glede na videne posnetke otrok o gibalnih dejavnostih. Na mestnih šolah so bili boljši le pri vprašanju o dvakrat poslanih povratnih informacijah o izvedbi pouka športa na daljavo. Sicer pa so vsi – tako na mestnih kot podeželskih šolah – pri pošiljanju komentarjev enkrat, dvakrat ali trikrat glede na videne posnetke o športnih dejavnostih na daljavo zbrali skupaj le nekaj manj kot 30 %, kar je pokazalo njihov zelo skromen odziv na videno, na otroke pa je – zelo verjetno – delovalo demotivirajoče.

Tudi določene druge raziskave so pokazale razlike v motivaciji slušateljev med tradicionalnimi metodami poučevanja (učilnica) in spletnim izobraževanjem (na daljavo) med pandemijo COVID-19. Malinauskas in Pozeriene, (2020) poudarjata, da imajo študentje/študentke na spletu (študij na daljavo) v izobraževanju močnejšo notranjo motivacijo kot tradicionalno v razredu. Prav tako sta poudarila, da imajo študentje/študentke, katerih vedenje je večinoma notranje urejeno (ali avtonomno), več zanimanja, zaupanja, vztrajnosti in boljše delovanje pri delu na daljavo kot študenti/študentke, ki so večinoma nadzorovani od zunaj. Tilga idr. (2020) navajajo, da sta vedenje in izobraževanje, ki podpirata avtonomijo, povezana tudi z vadbo mladostnikov v prostem času in njihovim sodelovanjem. Znanstveniki poudarjajo negativno vlogo vedenja, ki podpira avtonomijo v kontekstu gibalnega izobraževanja in udeležbe mladih posameznikov v G/ŠA, saj je zaradi sedečega načina življenja med zaprtjem javnega življenja interes po fizičnih oblikah druženja precej upadel. Znano je, da ima faktor trajanja sedečega položaja s prekinitvami pomembno preventivno vlogo. Med triurnim sedenjem bi moral slediti odmor vsakih 30 minut (npr. s 3 minutami zmerno intenzivne hoje), kar pri otrocih, starih 7–11 let, dokazano znižuje odziv insulina in plazme prostih maščobnih kislin pri zaporednih obrokih hranjenja v primerjavi z neprekinjenim sedenjem. Poudariti je treba, da redni premori sedečega položaja s spodbujanjem G/ŠA, četudi gre za nizkointenzivno kratkotrajno G/ŠA, predstavljajo prvi korak pri spreminjanju profila sedečega načina življenja. Na splošno bo dnevni čas, preživet v sedečem položaju, a z upoštevanjem prekinitev, potencialno prinesel pozitiven učinek tudi na prehranjevalne navade in presnovne procese pri otrocih, mladostnikih in odraslih (Margaritis idr., 2020). Opaža se tudi, da je priporočilo Svetovne zdravstvene organizacije (WHO, 2020) po enourni dnevni zmerni do bolj intenzivni G/ŠA v tem času prepovedi gibanja zaradi koronavirusne bolezni – v glavnem na škodo vseh, še posebej pa mladih – preveč zamrlo. Zaznati je določene škodljive spremembe v smislu upada psihofizičnih sposobnosti, sprememb življenjskega sloga, delno tudi sprememb lastnosti osebnosti oz. porasta nezdravih življenjskih navad, kot so spremenjeni prehranjevalni režimi, pretirano pitje alkohola, slabša kakovost spanja … Prav zato bo določen del populacije nosil trajne negativne posledice. V skladu z mednarodnimi smernicami je tudi francosko javno zdravstvo priporočilo za odrasle vključevanje najmanj 150 minut zmerne do bolj intenzivne vadbe na teden, vendar so raziskave pokazale, da je več kot tretjina prebivalstva, starega 18–79 let, neaktivna.

Poleg tega so francoske raziskave pokazale, da so tisti, ki delajo, sedeli povprečno 12 ur na dan med delovniki (4,17 ure dnevno na delovnem mestu) in 9 ur na dan med prostimi dnevi. Ista študija je pokazala tudi, da je sedeč položaj v službi povezan z več sedečega časa zunaj dela. Zaradi zaprtja javnega življenja zaradi COVID-19 in posebnih situacij, ki jih je povzročila pandemija virusa, so bili nacionalni podatki alarmantni. Kasneje pa so zaprtje javnega življenja za osem tednov, pojav povečanja sedečega časa, zmanjšanje G/ŠA postali v družbi kar hitro normalni. Strokovnjaki so neprestano svarili pred negativnimi posledicami – še posebej pri otrocih (Brettschneider in Naul, 2007).

Sicer pa je ob zaprtjih javnega življenja in spremenjenih pogojih delovanja največ učiteljev/učiteljic športne vzgoje razmišljalo o že uveljavljenem neposrednem stiku med učiteljem/učiteljico in učencem/učenko, kar se jim je zdel nujen pogoj za uspešno gibalno učenje, a se niso mogli uspešno soočiti z nadomestnimi oblikami dela, s katerimi bi lahko kljub vsemu precej zmanjšali izpad neposrednega fizičnega stika.

Lavrin idr. (2019) poudarjajo, da večina ukrajinskih študentov/študentk podpira tradicionalno obliko pouka telesne vzgoje tudi v visokem šolstvu. Ukrajinski raziskovalci trdijo, da njihovi učitelji in učiteljice telesne vzgoje niso bili pripravljeni izvajati pouka telesne vzgoje brez primernih pogojev za delo in brez dobrega telesnega stanja med pandemijo COVID-19. Tudi jim ni bilo lahko ponuditi alternativne – za otroke zanimivih oblik in načinov organiziranja individualnih kondicijskih treningov, kar bi omogočilo vzdrževanje morfološko funkcionalnih kazalcev telesnega zdravja.

Podobno slabšo učinkovitost z alternativnimi izvedbami pouka športne vzgoje med zaprtjem šol najdemo tudi v slovenskem okolju, kar delno kažejo tudi rezultati te raziskave.

Predstavljena raziskava ima tudi nekaj omejitev. Vprašalnike so izpolnjevali starši, ki jim je bilo zaradi subjektivnega pogleda na to obdobje ter zajemanja različnih obdobij izvajanja šolanja na daljavo težje objektivno oceniti izvedbo pouka športa na daljavo. Uporaba objektivnih merilnih orodij, kot so merilniki pospeška ali pedometri, bi lahko omogočili natančnejše kvantifikacije časa pri G/ŠA in njegovih komponentah. Med drugim naša študija ni odkrila nobene interakcije med spolom, razredom in stopnjo G/ŠA. V prihodnosti bomo morali izvesti intervencijske študije o različnih vplivnih dejavnikih, da bi raziskali razlike v učinkih različnih ravni G/ŠA na različna stanja razpoloženja, dejavnosti, odvisnosti.

Informacije, zbrane v tej raziskavi, poudarjajo promocijsko in statistično potrebo po posredovanju informacij, vezanih na izvedbo G/ŠA pri pouku športa na daljavo. Med morebitnim ponovnim zapiranjem javnega življenja so vsi ti podatki lahko koristen vir pri sprejemanju ukrepov, vezanih na promocijo G/ŠA, in posledično zdravja v okvirih nacionalnih in mednarodnih institucij.

Zaključek

Ne glede na omejitve ta raziskava prispeva h karakterizaciji stranskih učinkov zaprtja države na vedenje ljudi oz. slovenskih otrok, starih 6–12 let. Ugotovitve kažejo glede na statistiko obdelanih podatkov tudi na zmanjševanje kakovosti G/ŠA otrok med zaprtjem javnega življenja oz. v šolskem prostoru, kar je povezano z omejitvami in pandemijo CoViD-19. Priporočila, promocija za aktivni življenjski slog med pandemijo ter zagotavljanje optimalnih pogojev (IKT-oprema šol in domov, prilagoditve izvedbe pouka športa) so bistveni za preprečevanje možnih bodočih negativnih učinkov glede gibalne neaktivnosti na zdravje populacije otrok. Hkrati pa lahko tudi spodbujanje G/ŠA in zdravega življenjskega sloga v nepandemičnem obdobju pozitivno učinkuje v smislu preventive v primeru nadaljnjih zaprtij javnega življenja.

Summary

In the second wave of measures to contain the COVID-19 epidemic in Slovenia, ordinances closed public life, and thus primary schools, for three months from 16 October 2020 to 11 April 2021 with certain interruptions, a closure which was the longest in the European Union. The aim of the study was to investigate how physical education classes were conducted during remote schooling. In completing the questionnaires, parents fully answered questions for 3,936 children (6-12 years old), of which there were 1,866 girls and 2,070 boys. The majority of responses referred to children aged 7-10 (86.9%), while 13.1% were younger or older. The rural (2,154) and urban (1,782) areas were equally represented, and no region stood out in terms of the number of responses.

Before conducting physical education classes during remote schooling, students most often received online instruction once (f = 1,431; 36.4%), slightly fewer three times a week (f = 1,412; 35.9%), while 144 students (3.7%) never received online instruction (Graph 1). Next, we compared the answers between urban and rural areas (Table 1) and found discrepancies in the frequency of giving instruction (χ^2 = 47.74; p = 0.001). Teachers in rural areas gave instruction three times a week in 853 (39.6%) responses, which is more often than teachers in urban schools, who gave such instruction in 559 (31.4%) responses. In contrast, 87 (4.9%) students at urban schools and 57 (2.6%) students at rural schools received no instruction. The results, therefore, show that instruction for physical education classes was more often given to students in rural schools.

Numerous, i. e., 2,502 (63.3%) students never had live physical education classes via video call, while 881 (22.4%) had such classes once, 271 (6.9%) twice, and 282 (7.2%) three times a week (Graph 2). We found discrepancies between urban and rural areas (χ^2 = 61.62; p = 0.001). Among urban school students, 1,016 (57.0%) respondents, while among rural school students as many as 1,486 (69.0%) respondents never had classes via video call. Moreover, 465 (26.1%) students from urban schools and 416 (19.3%) students from rural schools had such classes once a week, while 142 (8.0%) students from urban schools and 129 (6.0%) students from rural schools had physical education classes via video call twice a week. Additionally, 159 (8.9%) students from urban schools and 123 (5.7%) students from rural schools had such classes three times a week. Based on the results, we find that physical education classes via video call were more often conducted in urban schools.

Also, as many as 2,564 (65.1%) students or parents never sent teachers recordings of the physical exercises given in physical education classes (Graph 3). Among students who sent recordings, most sent them once (f = 989; 25.1%), followed by students who sent them twice (f = 216; 25.1%), and the lowest number of students sent them three times (f = 167; 4.2%). No differences in sending feedback were found between urban and rural students (χ^2 = 7.33; p = 0.062).

Of 1,372 students who sent a recording of the physical exercises to their teacher at least once a week, 486 (35.4%) never received feedback from the teacher, 576 (42%) students received feedback once a week, 155 (11.3%) students received such feedback twice, and 155 (11.3%) students received such feedback three times a week (Chart 4). Table 5 shows that no statistically significant differences were found between students in urban and rural schools (χ^2 = 3.21; p = 0.36).

Thus, 244 (41.6%) students from urban schools and 332 (42.3%) students from rural schools received feedback from teachers once a week. Only 69 (11.8%) students from urban schools and 86 (11%) students from rural schools received feedback twice, while 57 (9.7%) students from urban schools and 98 (12.5%) students from rural schools received such feedback three times a week.

The study showed certain negative effects resulting from the closure of public life during the COVID-19 epidemic, and thus also primary schools, and conducting physical education classes during remote schooling for children aged 6 to 12. The results of this study should be of great help to future decision makers in preparing measures in the event of a resurgence of the COVID-19 epidemic.

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POSTGRADUATE CERTIFICATE IN EDUCATION (PGCE) STUDENTS' EXPERIENCE OF MENTORING

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Abstract/Izvleček The school practicum is an essential component of pre-service student teachers' training in the PGCE qualification, affording opportunities to develop mentees' own identities. Along with a range of competences. This study explores how student teachers at Nelson Mandela University perceived their School-Based Learning (SBL) mentoring experience about the roles that mentors should fulfil based on an adapted seven-factor framework (Hudson, 2004, 2009) by adopting a post-positivist paradigm. The findings showed that both groups of participants who would like to return to the same mentor again or those who wish not to do so indicated that these seven factors played a crucial role in their decision-making.

Podiplomski certifikat iz izobraževanja (PGCE) – izkušnja študentov z mentorstvom

Šolska praksa je bistvena sestavina predhodnega usposabljanja študentov bodočih učitelje za pridobitev kvalifikacije PGCE (ang. Postgraduate Certificate in Education), ki ponuja priložnosti za razvoj lastne identitete mentorirancev in vrsto kompetenc. Študija raziskuje, kako so študentje bodoči učitelji na Univerzi Nelsona Mandele dojemali svoje mentorske izkušnje s šolskim učenjem (ang. School-Based Learning SBL) o vlogah, ki bi jih morali mentorji izpolnjevati na podlagi prilagojenega okvira sedmih dejavnikov (Hudson, 2004, 2009) s sprejetjem postpozitivistične paradigme. Ugotovitve so pokazale, da sta tako skupini udeležencev, ki bi se znova želeli vrniti k istemu mentorju, kot tisti, ki tega ne želijo, navedli, da je imelo teh sedem dejavnikov odločilno vlogo pri njihovem odločanju.

Keywords:
ICT modelling, ICT pedagogical knowledge, mentor, mentoring, model, personal attributes, pedagogical knowledge, system requirements

Ključne besede:
IKT modeliranje, IKT pedagoško znanje, mentor, mentorstvo, model, osebne lastnosti, pedagoško znanje, sistemske zahteve

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Introduction

Mentoring as a concept lacks a unanimous definition (Charron, Kalbarczyk, Martin, Combs, Ward and Leontsini, 2019; see also Niklasson, 2018). The conceptualisation of Petrovska, Sivevska, Popeska and Runcheva (2018) applies within the Work Integrated Learning (WIL) space when the Post Graduate Certificate in Education (PGCE) students at Nelson Mandela University interact with their mentors, since these authors posit that mentoring is a complex activity that demands interactivity when the mentor as the expert engages with the mentee in a supportive manner to enable a learning space conducive to developing the mentee's work competences, professional development and career advancement. The above suggests that interaction, mutual learning, and support aid in developing proficiencies. It also resonates with the competences to be realised by students as proclaimed by the South African Department of Higher Education (2015) while the student-teacher is at university and during their work-integrated learning (WIL) or teacher practicum. According to the Minimum Requirements for Teacher Education Qualifications (MRTEQ), the minimum competences include (Department of Higher Education, 2015, p. 62, 64) the following as indicated by these extracted phrases:

> *"… sound subject knowledge … understand how to teach their subject … sound understanding of who their learners are and how they learn … communicate effectively … high levels of literacy, numeracy and Information Technology skills … knowledgeable about the school curriculum … understand diversity … manage classrooms effectively … assess in reliable and varied ways … positive work ethic and values … reflect critically on their own practice ... adapt to evolving circumstances"*

These competences resemble the perspectives stated by Vršnik Perše, Ivanuš Grmek, Bratina and Košir (2015). It is argued that school-based mentoring during school-based learning (SBL), also sometimes referred to as work-integrated learning (WIL), could play an essential role in developing these aspects. SBL, through mentoring, enables trainee teachers to negotiate the transition process from theory to practice (Buhagiar and Attard Tonna, 2015; Vršnik Perše et al., 2015) and, over time, helps students to provide quality teaching to learners. At the same time, Miles (2008) and Yuan (2016) caution that mentoring is not always beneficial, as it can either promote or impede personal growth among pre-service student-teachers.

In addition, it is also possible that the mentoring process could be challenging for mentors if they are unsure about their roles (Frick, Carl and Beets, 2010; Dlengesele, 2020; Moosa and Rembach, 2020). The focus of our research was to ascertain to what extent the role a mentor is expected to fulfil influences PGCE student teachers' (mentees') willingness to return to the same mentor-teacher (or not to return), while at the same time providing an overview of the perceived roles fulfilled by their mentor teachers and those not fulfilled by utilising the Hudson framework (2004, 2005, 2009). Given our research, the next section will provide an overview of findings on mentoring research in the South African context.

Mentoring research findings in South Africa

The quantitative findings of a study by Du Plessis (2013) indicated that positive relationships were fostered between mentor teachers and their mentees, that the mentor was positive towards mentoring, displayed positive dispositions towards teaching, addressed negative emotions of the mentees and motivated the mentees towards the teaching profession. The data showed that the mentors were good role models, provided sound advice, were willing to assist and that their feedback was constructive. Concerns that were not attributed to all mentors related to lesson planning guidance, time constraints that influenced support interaction, and having to stand in when a mentor teacher was absent. Du Plessis (2013) posits that greater collaboration between lecturers and mentors should be fostered, mentors be made aware of the important role of support and modelling, and training be provided to assist in providing feedback.

Modipane and Kibirige (2015) conducted research with fourth-year B.Ed. pre-service student teachers. They found that mentees felt that their mentors did not furnish them with support and skills, which led to an unsatisfactory mentoring experience as they were not learning from their mentors' modelling. Furthermore, mentees were given heavy workloads, taught in overcrowded classrooms and experienced discipline concerns. Teacher attitudes were not positive towards them, and there were concerns over curriculum-related knowledge. Concerns related to mentors' lesson planning and what mentees' lesson planning constitutes, also emerged, while it was also indicated that there was a theory-practice gap, i.e., what they are taught at university and real-life classroom experiences.

A study by Baartman (2016) found that the personal attributes of their mentors were positive and that they were supported. However, half the mentors were not always in class to fulfil a supportive and guidance role. While mentees received feedback, this was mostly in oral form and not always critical and constructive. Also, the mentors' teaching was not always perceived as effective. Although the mentoring experience was conducive overall, feedback, observation, pedagogical knowledge, modelling, and system requirements were areas of concern. The researcher recommended that training for mentors be seen as important related to their roles, and that there be greater collaboration between the university (lecturers) and schools (mentors).

Hugo (2018) conducted research on Post Graduate Diploma in Education (PGDE) students teaching in grades 1 to 3 by analysing the participants' teaching practice workbooks which their mentors completed. Her analysis showed that some mentors do not provide constructive feedback, while some provided none at all. The researcher thus redeveloped the teaching practice workbooks and suggested that mentor teachers should receive specific training regarding their roles, including more direction and instruction.

A study by Sokhulu (2018) indicated that overall, mentees' classroom teaching was observed, and beneficial feedback was furnished. The personal attributes such as relationships were experienced as positive. Some participants indicated that they started to implement new teaching strategies and classroom management strategies that they gained from their mentors. However, some mentees experienced concerns related to their mentors which led them to approach other teachers at school for support. In addition, some students felt that there was a theory-practice gap between the SBL experience and university theoretical studies.

Moosa and Rembach (2018) found in their study that mentees' pedagogical decisions were informed by their mentors. The mentors foregrounded administrative tasks, which led to teaching taking a back seat. The findings showed that for some mentees, there was a mismatch between what they were taught at university and their experience at school. Mentors were also negative towards the teaching profession, which resulted in mentees questioning their career choice. Mentees expected their mentors to expose them to system requirements, to serve as role models, to provide feedback on lesson planning and teaching and make them feel welcome in the classroom; however, this was not always the case.

Ngibe, Pylman, Mammen and Adu (2019) found that mentees struggled to teach in overcrowded classrooms consisting of 40+ learners, something which is quite common in the South African context, which leads to classroom management issues; confidence levels were affected negatively, and some mentees even lost their self-control. A theory-practice gap was evident; while mentees were exposed to constructivist learner-centred approaches, some teachers still taught in the traditional way.

Research by Dlengezele (2020) found that mentor teachers were not complying with the Hudson (2004) five-factor framework. However, mentors had not received training to develop their mentoring roles.

Findings from another study by Moosa and Rembach (2020) suggest that most mentees felt unsupported by mentor teachers, owing to negative interactions and experiences, and some felt unwelcome. In addition, it was noted that many mentors struggled with classroom management and witnessed unlawful corporal punishment. They recommended that greater collaboration between schools and the university must be fostered so that schools, mentors, and mentees could have greater clarity about expectations and roles.

Context and gap

It was highlighted in the previous section that mentor teachers are not well versed in the roles that they should fulfil. The importance of these roles is vital since, if mentors are not on top of these roles, this has the potential to counteract the intended purpose of WIL (Frick, Carl and Beets, 2010; Dlengesele, 2020; Moosa and Rembach, 2020). Jita and Munje (2022) posit that the mentees' personal growth could be attributed to their mentors' experience, personal characteristics, and the creation of growth opportunities by the mentor. In addition, they state that the mentee's perception of their mentor shapes their SBL experience, which then highlights the important role and influence of the mentor teacher. It is also during the WIL experience that mentees are afforded opportunities to make connections between theory and practice (Buhagiar and Attard Tonna, 2015; Vršnik Perše et al., 2015); however, there are also possibilities for theory-practice gaps to emerge (Modipane and Kibirige, 2015; Sokhulu, 2018; Ngibe at al., 2019).

In the PGCE qualification, mentees are exposed to WIL under the supervision of a mentor for period ranging from eight to twelve weeks, after which the South African Department of Higher Education (Department of Higher Education and Training, 2015) expects every PGCE student to have developed the confidence and self-efficacy to teach effectively within an inclusive classroom environment. Unfortunately, no data currently exist on how pre-service student teachers in the PGCE Programme at Nelson Mandela University perceive the SBL or WIL mentoring experience. Mentoring research within the South African context is important (Moosa and Rembach, 2020). The research reported in this paper thus resonates with this call, as it investigates whether a mentor teacher's personal and professional attributes or actions, system requirements, pedagogical knowledge, modelling, feedback, ICT pedagogical knowledge, or ICT modelling do influence a student teacher's self-efficacy and willingness to return to the same mentor-teacher (or not to return).

Theoretical framework

Kram (1985) and Ragins and Kram (2007) refer to an individual's career and psychosocial functions related to mentoring. While these functions were not theorised on the student teacher per se, it seems plausible to relate these functions to Hudson's (2004, 2009) the five-factor Mentoring Perceptions of Student Teaching (MEPST) model: (1) personal attributes, (2) system requirements, (3) pedagogical knowledge, (4) modelling, and (5) feedback. In Hudson (2004, 2009) and Hudson, Skamp, and Brooks (2005), five-factor mentor-teacher roles appear to resonate with aspects highlighted by Vršnik Perše et al. (2015), Valenčič Zuljan and Marentič Požarnik (2014) and Buhagiar and Attard Tonna (2015). Our position on how the Hudson framework relates to Kram (1985) and Ragins and Kram (2007) is as follows: We posit that personal attributes can be related to the psychosocial function of the mentor, while system requirements, pedagogical knowledge and modelling traits or actions relate to the mentor's career function. Feedback, as a rule, straddles the psychosocial and career functions since it facilitates the mentee's vocational and psychosocial development as meta-cognition, i.e., thinking about one's thinking during co-reflection.

Pre-service student teachers fall within the initiation stage of the Kram (1983, 1985) framework, and it is during this stage that they receive professional assistance, coaching, vouching and protection from their mentors as they pursue career advancement (Kram, 1983, 1985; Ragins and Kram, 2007). It is also in the initiation stage where student teachers, with the help of their mentors, develop intra- and interpersonal psychosocial traits vis-à-vis identity, self-worth, self-efficacy, trust, and closeness (Kram, 1985; Ragins and Kram, 2007; see also Greiman, Torres, Burris and Kitchel, 2007).

The learning expected to develop during SBL can be framed within the Social Learning Theory (Bandura, 1977) and Situated Cognition Theory frameworks (Brown, Collins and Duguid, 1989). Situated Cognition Theory postulates learning as a social and situated activity that cannot be disconnected from the context or space in which it occurs. Thus, cultural and physical factors, individuals and language play key roles (Brown, Collins and Duguid, 1989). Similarly, Social Learning Theory emphasises authentic contexts and posits that an individual can learn from another individual or group through observation, imitation, and modelling; however, change in the behaviour of the learner is not a necessity (Bandura, 1997). Self-efficacy is a key personal aspect of Social Learning Theory which refers to an individual's belief(s) and confidence in his/her ability to produce specific performance attainments while exerting control over his/her motivation, behaviour, and social environment through social persuasion, observing how people similar to oneself successfully manage tasks, positive peer encouragement about one's capability to succeed in given activities, emotional arousal (Bandura, 1977, 1982, 1997) and imagining or visualising experiences (Maddux, 2002).

The Department of Higher Education and Training (2015) and The Department of Basic Education (2016) strongly advocated the importance of embracing and utilising Information and Communication Technology (ICT) for teaching and learning; this was also mentioned during the State of the Nation Address (SONA) in 2019 by the President of South Africa (Matiwane, 2019; McLeod, 2019). It is thus assumed that PGCE student teachers will also be exposed to ICT during the SBL. However, the Hudson framework does not include this aspect; consequently, we opted to incorporate this variable into Hudson's model (2004, 2009) five-factor Mentoring Perceptions of Student Teaching (MEPST) Model.

Research objectives and hypotheses

To achieve the identified research objectives and guide the overall conduct of the study, the following null hypothesis (Ho1) was formulated:
A mentor teacher's personal and professional attributes or actions, system requirements, pedagogical knowledge, modelling, feedback, ICT pedagogical knowledge, ICT modelling do not influence a student teacher's self-efficacy and willingness to return to the same mentor-teacher (or not to return).
As an alternative hypotheses (Ha_{1-7}), it is posited that:

- statistically significant positive relationships exist between a mentor teacher's personal attributes or actions (Ha_1), system requirements (Ha_2), pedagogical knowledge (Ha_3), modelling (Ha_4), feedback (Ha_5), ICT pedagogical knowledge (Ha_6), ICT modelling (Ha_7) and the student teacher's self-efficacy and willingness to return to his/her mentor-teacher (or not to return).

Methods, sample, and research instrument

This study is underpinned by a quantitative-positivist paradigmatic approach, adopting a cross-sectional survey research strategy where the viewpoints of all Nelson Mandela University students registered in the PGCE Programme in 2018 were elicited using a 62-variable, self-administered structured questionnaire. This research followed the ethical guidelines stipulated in the Nelson Mandela University Guidelines for Ethical Conduct in Research.
The questionnaire was derived from the Mentoring Perceptions of Student Science Teaching (MEPST) Model (Hudson, 2004, 2009). The MEPST is considered a valid and reliable research instrument to determine the perceptions of the mentoring roles of student teachers (mentees). The questionnaire was divided into three sections. Section A elicited details about the school method reflected on; demographic information about the mentor teacher; and how often the mentor-teacher provided feedback to observed and unobserved lessons. Section B focused on the student teacher's perceptions of the mentoring experience related to the MPEST model, using a 6-point Likert scale. Section C elicited the biographical details of the mentee as respondent.

Convenience sampling was used since the focus was on PGCE students' perceptions. The two printed questionnaires, one for each of their teaching methodology (didactics) specialisation subjects, were distributed to 100 PGCE students present over two group contact sessions. This resulted in potentially two hundred responses, i.e., two responses per student per subject method (didactics). The time to complete the questionnaires during these sessions was negotiated with the two lecturers on the day when they met the two groups of students. Each PGCE student willing to participate received two questionnaires, one for each of their two specialisation school subjects. Twenty-seven questionnaires were considered unusable, either because the respondents marked the same answer for all the questions, or because they chose the "No opinion" option for most of the responses to a significant portion of the questionnaire, which could be an indication that they did not want to participate. The responses of the remaining 173 questionnaires associated with a variable code were entered into MS Excel and then imported into the Statistical Package for Social Sciences (SPSS version 25.0). While the response rate was one hundred per cent, the survey response rate was 86.5%.

Data analysis

Factor analysis, a statistical technique used to assess commonalities among variables, reduces measurable and observable variables to less unobservable latent variables sharing common variance (Bartholomew, Knott and Moustaki, 2011). These unobservable factors are mostly hypothetical constructs used to represent variables. The independent latent variables were constructed and measured on a six-point Likert-style rating scale where "0", "1", "2", "3", "4", and "5" denoted "No opinion", "Never", "Rarely", "Sometimes", "Often" and "Always," respectively.
The Cronbach alpha was used to measure the reliability (Sekaran, 2003) or internal consistency (Pallant, 2007) of the instrument. The Cronbach's coefficient alpha ranges from 0 to 1, where a higher value indicates greater reliability. It is suggested that 0.7 should be the minimum acceptable cut-off (Pallant, 2007). The various tables in the quantitative results section show that the range of alpha coefficients of the seven constructs was between 0.851 and 0.957, all above the threshold of 0.70.

From the questionnaire of sixty-two variables, exploratory factor analysis (EFA principal component method with varimax rotation) identified seven key variables that explained 70.04% of the variance in the sample (see Appendix 1). All KMO values for the individual items (> 0.90) were well above 0.5 and the overall KMO measure of 0.955. This highlighted that the data were adequate to conduct an EFA, while Bartlett's test for sphericity (X2 (1891) =10707.603, $p < 0.001$) indicated that a pattern existed between items.

In addition, the seven extracted factors showed adequate convergent validity and discriminant validity, i.e. for convergent validity, the factor loadings were all above the minimum recommended value of 0.35 (Hair, Black, Babin and Anderson, 2010) while for discriminant validity, the correlation matrix did not show any problematic cross-loadings with correlations above 0.70 (Hair et al., 2010). Consequently, these complex variables--Personal Attributes (α=.934; n=13; $\bar{x}$=3.37; p<.001), System Requirements (α=.930; n=11; $\bar{x}$=2.71; p<.001), Pedagogical Knowledge (α=.957; n=15; $\bar{x}$=2.99; p<.001), Modelling (α=.916; n=8; $\bar{x}$=3.01; p<.001), Feedback (α=.900; n=8; $\bar{x}$=2.96; p<.001), Pedagogical Knowledge – ICT (α=.936; n=5; $\bar{x}$=2.44; p<.001) and Modelling - ICT (α =.851; n=2; $\bar{x}$=2.44; p<.001)--appeared to be interrelated as expected, correlated appropriately, fulfilled criteria for reliability and validity, and represented the 62-item latency construct "satisfaction with mentor" in a reliable manner.

The "Yes" and "No" option where students had to respond whether they would want to return to the same mentor were also quantitatively analysed, and mentees had to textually explain their response. However, the quantitative textual responses as data are not reported as part of the results, since these will form the basis for another research paper.

Descriptive statistics familiarise the reader with the data. Inferential statistics were used for hypothesis testing. Based on an adaptation of Hudson's (2004, 2009) five-factor MPST Model, this study hypothesised that *ceteris paribus*, no statistically significant relationship exists between a mentor teacher's personal and professional attributes/actions and the student teacher's self-efficacy and willingness to return to the same mentor-teacher. Mentor teachers' attributes/actions were encapsulated in the variables PA, SR, PK, M, F, PKICT, MICT.

The null hypotheses for this study were tested using one-way Analysis of Variance (ANOVA) and the Wilks' lambda (λ) statistic. An alpha (α) value of 0.05 is used in most disciplines and should the p-value be less than 0.05, the difference is statistically significant, and the null hypothesis should be rejected. However, if p>=0.05, the researcher is bound to accept the null hypothesis. Wilks' Lambda (λ) procedure was used to test the proportion of variance that was not explained by differences within groups. The λ value varies between 0 and 1, and if λ < is 1, most of the observed variance can be attributed to differences between groups, and the null hypothesis would be rejected (Tacq, 1997).

Quantitative results

Biographical information

The biographical information about the mentor teachers shows that from a sample of 173 respondents (male=48; female=125) as presented in Table 1, the gender distribution of the mentor teachers was 27% male and 73% female, while most mentor teachers were in the age range of 40 to 49, with the second-largest range being from 30 to 39 years.

As each respondent had an opportunity to complete a questionnaire twice, once for each method in which the participant specialised, the number of respondents was twenty-four male and 63.5 females. The .5 in 63.5 denotes that one participant completed only one of the two questionnaires. Most of the PGCE pre-service student teacher participants fell in the age range of 20 to 24, followed by 25 to 29, while most had isiXhosa as their mother tongue, followed by English and Afrikaans, respectively. Most of the schools (52.6%) that these students attended were located in a city or town area, while 31.8% of the schools were in a township area, i.e., schools mainly on the periphery of the city or town because of the segregation policy of apartheid before 1994 and in many instances, serving learners from informal settlements. Most participants were Further Education and Teaching (FET) English Home language or Primary Language method (didactics) students, followed by Economic and Management Science method (didactics) students, and Life Orientation method (didactics) students, respectively.

Only 35.3% of the participants indicated that they received feedback between one to five times from their mentor after lesson observation; 17.9% received feedback between 6 and 9 times and 11% indicated that they received feedback between ten

and nineteen times, while 30.1% indicated they did not receive any feedback from their mentor.

Personal attributes

The Likert statements related to Personal Attributes showed that allowing one to teach as often as one wanted was the most positive statement, with 64.7% when the "always" and "often" responses were combined, followed by feeling comfortable to talk to and instilling a positive attitude with at 63.6% and 61.3%, respectively. The lowest response was related to mentors not addressing the mentee's teaching anxieties, as indicated by 32.4% of the mentees.

Table 1. Personal attributes - Specification and pattern matrix of latent constructs in the questionnaire

Hox	**Item number**	**Item**	**Mean value of an item**	**Factor loading**	**Communality**	**Combining Never & Rarely (1 &2)**	**Combining Often & Always (4 & 5)**
	Factor 1 – Personal Attributes (PA) Cronbach alpha=0.934; Items=13; Mean Scale Score=3.37 (p<.001); Specification=Reflective						
	b20	Show sympathy towards you when your teaching lesson did not play out as planned	3.20	0.764	0.769	28.9%	48.0%
	b55	Show support when you were teaching your subject(s)	3.31	0.855	0.756	17.3%	52.6%
	b41	Make you feel more confident as a teacher	3.45	0.766	0.728	22.5%	59.0%
	b11	Instil positive attitudes in you towards teaching your subject(s)	3.47	0.739	0.713	20.8%	61.3%
	b57	Instil confidence in you to teach	3.39	0.720	0.688	22.0%	56.6%
Ho1	b9	Inspire you to teach	3.45	0.747	0.686	23.1%	58.4%
	b23	Encourage you to teach	3.54	0.531	0.567	19.1%	58.4%
	b59	Attentively listen to you on teaching matters	3.37	0.749	0.650	21.4%	56.6%
	b26	Assist you in reflecting on improving your teaching practices	2.97	0.560	0.532	29.5%	43.4%
	b34	Appear to be comfortable to talk to about teaching	3.68	0.666	0.587	14.5%	63.6%
	b32	Allow you to teach as often as you want to	3.67	0.649	0.573	13.9%	64.7%
	b61	Allow you flexibility in planning for teaching	3.38	0.667	0.458	18.5%	57.2%
	b1	Address your teaching anxieties	2.91	0.692	0.443	32.4%	38.7%

System requirements

Concerning system requirements, the two highest responses referred to observing in class when the trainee was teaching, with 54.9%, followed by discussing the subject's aims with 48%.

The responses with the lowest value--28.9%--jointly related to discussing school policies related to teaching and learning and explaining the CAPS (Curriculum Assessment Policy Statement) document.

Table 2. System requirement attributes - Specification and pattern matrix of latent constructs in the questionnaire

Hox	**Item number**	**Item**	**Mean value of an item**	**Factor loading**	**Communality**	**Combining Never & Rarely (1 &2)**	**Combining Often & Always (4 & 5)**
	Factor 2 – System Requirements (SR) Cronbach alpha=0.930; Items=11; Mean Scale Score=2.71 (p<.001);Specification=Reflective						
	b60	Show you an example of an ATP for the subject	2.88	0.755	0.741	31.8%	41.6%
	b17	Observed you in class when you were teaching	3.42	0.784	0.695	20.2%	54.9%
	b38	Explain what the school requires from you as a student teacher	2.63	0.866	0.650	41.6%	34.7%
	b43	Explain to you how the school deals with barriers to learning among learners	2.61	0.783	0.649	35.8%	33.5%
	b62	Explain the school's Disciplinary Code of Conduct for learners to you	2.50	0.749	0.642	40.5%	32.9%
Ho_2	b19	Explain the CAPS documents to you	2.43	0.800	0.640	52.6%	28.9%
	b2	Explain the school's Teacher Conduct Policy to you	2.54	0.723	0.610	41.0%	31.2%
	b52	Explain how the school promotes parental involvement in their children's' education	2.62	0.553	0.599	35.8%	33.5%
	b35	Discuss what is expected from you by the university i.t.o. teaching	2.64	0.557	0.596	40.5%	34.7%
	b6	Discuss the school policies used for teaching	2.47	0.508	0.570	48.6%	28.9%
	b12	Discuss the aims of teaching your subject	3.02	0.628	0.473	31.2%	**48.0%**

Pedagogical Knowledge

Relating to Pedagogical Knowledge, the highest two responses related to showing content expertise and discussing content knowledge, as indicated by 69.4% and

54.3% of the participants, while the statement with the lowest response of 34.7% was associated with assisting the student with timetabling issues.

Table 3. Pedagogical knowledge attributes - Specification and pattern matrix of latent constructs in the questionnaire

Hox	**Item number**	**Item**	**Mean value of an item**	**Factor loading**	**Communality**	**Combining Never & Rarely (1 &2)**	**Combining Often & Always (4 & 5)**
		Factor 3 – Pedagogical Knowledge (PK) Cronbach alpha=0.957; Items=15; Mean Scale Score=2.99 (p<.001); Specification=Reflective					
Ho3	b49	Show you how to assess the learners' learning effectively	2.95	0.727	0.814	32.4%	46.2%
	b3	Show content expertise	3.82	0.728	0.802	11.0%	69.4%
	b58	Share with you areas which he/she (mentor) find it difficult to teach	2.89	0.882	0.796	32.4%	39.9%
	b33	Provide you with strategies to solve teaching problems you encountered	3.13	0.724	0.790	24.3%	47.4%
	b25	Guide you with your lesson preparation	2.78	0.747	0.763	37.0%	37.6%
	b42	Give you clear guidance for planning to teach your lessons	2.85	0.729	0.758	32.9%	43.9%
	b24	Discuss with you the (content) knowledge you need for teaching your subject(s)	3.21	0.874	0.713	30.6%	54.3%
	b51	Discuss with you questioning skills for effective teaching	2.84	0.777	0.712	30.1%	42.2%
	b40	Develop your strategies for teaching	2.87	0.681	0.697	31.8%	42.8%
	b36	Assist you with time-tabling your lessons	2.69	0.546	0.665	39.3%	34.7%
	b44	Assist you with preparing your lecturer crit lessons	2.68	0.772	0.658	37.6%	37.0%
	b53	Assist you with classroom management strategies for teaching	2.98	0.779	0.658	26.6%	45.7%
	b22	Assist you in implementing different teaching strategies	3.03	0.710	0.609	31.2%	45.1%
	b7	Assist you in finding teaching resources	3.35	0.525	0.550	30.6%	**53.2%**
	b28	Assist you in developing your teaching strategy	2.83	0.598	0.523	32.9%	40.5%

Modelling

The highest two values related to modelling were showing enthusiasm when teaching and showing expertise when teaching the subject, as indicated by 55.5% and 51.4% of the participants. The lowest response of 35.3%, which related to reiterating the importance of well-designed activities.

Table 4. Modelling attributes - Specification and pattern matrix of latent constructs in the questionnaire

Hox	**Item number**	**Item**	**Mean value of an item**	**Factor loading**	**Communality**	**Combining Never & Rarely (1 &2)**	**Combining Often & Always (4 & 5)**
		Factor 4 – Modelling (M) Cronbach alpha=0.916; Items=8; Mean Scale Score=3.01 (p<.001); Specification=Reflective					
Ho4	b39	Use subject language from the current CAPS	2.90	0.711	0.821	34.1%	38.7%
	b37	Use hands-on materials for teaching	2.87	0.752	0.723	36.4%	37.6%
	b45	Show expertise to teach his/her subject effectively	3.13	0.778	0.705	28.3%	51.4%
	b27	Reiterate the need to have well-designed activities for the learners	2.70	0.814	0.684	41.0%	35.3%
	b4	Model effective classroom management when teaching	3.31	0.774	0.642	26.0%	50.9%
	b56	Model different teaching strategies for teaching the subject	2.89	0.720	0.637	30.1%	42.2%
	b54	Model (show) how to teach difficult concepts (aspects)	2.84	0.582	0.568	32.9%	37.6%
	b48	Display enthusiasm when teaching the subject	3.42	0.660	0.563	17.9%	**55.5%**

Feedback

Concerning feedback, observing the student teaching before providing feedback and providing oral feedback on lessons taught had jointly the same response of 53.8%. The lowest value referred to electronic feedback, which was 22.5%.

Table 5. Feedback attributes - Specification and pattern matrix of latent constructs in the questionnaire

Ho_x	Item number	Item	Mean value of an item	Factor loading	Communality	Combining Never & Rarely (1 &2)	Combining Often & Always (4 & 5)
		Factor 5 – Feedback (F) Cronbach alpha=0.900; Items=8; Mean Scale Score=2.96 (p<.001); Specification=Reflective					
Ho_5	b5	Review your lesson plans (before teaching)	2.56	0.501	0.635	43.4%	28.3%
	b47	Provide you with written feedback on your teaching lessons	3.04	0.738	0.691	35.3%	43.9%
	b50	Provide you with oral feedback on your teaching technique	3.38	0.778	0.689	20.2%	53.8%
	b46	Provide electronic feedback on your teaching	2.09	0.569	0.639	53.2%	22.5%
	b8	Observe you teach before providing feedback	3.36	0.754	0.629	24.3%	53.8%
	b29	Give clear expectations regarding the way you should teach your subject(s)	2.97	0.630	0.504	33.5%	43.4%
	b21	Discuss the evaluation (assessment) of your teaching	3.21	0.596	0.549	31.8%	48.0%
	b15	Clearly articulate what you need to do to improve your teaching	3.06	0.578	0.519	28.9%	41.6%

ICT Pedagogical Knowledge and ICT Modelling

Concerning ICT Pedagogical Knowledge and ICT Modelling, it was found that all statements related to these factors result in the highest value being 34.7% regarding displaying ICT expertise and the lowest being 24.9% concerning modelling how to use ICT for teaching and learning.

The data revealed that two of three (n=119; 68.8%) PGCE student teachers expressed a desire to return to their mentor-teacher for further mentoring, while approximately one-third (n=54; 31.2%) were unwilling to do so. Approximately 72% (125) of these possible returnees were female. A statistically significant correlation (r_{xy}=.476; p<.001) was found between a respondent's willingness to return and the number of lessons assessed by the mentor..

Table 6. ICT pedagogical knowledge and ICT modelling attributes - Specification and pattern matrix of latent constructs in the questionnaire

Hox	**Item number**	**Item**	**Mean value of an item**	**Factor loading**	**Communality**	**Combining Never & Rarely (1 &2)**	**Combining Often & Always (4 & 5)**
		Factor 6 – Pedagogical Knowledge – ICT (PKICT) Cronbach alpha=0.936; Items=5; Mean Scale Score=2.44 (p<.001); Specification=Reflective					
Ho6	b30	Display ICT expertise to teach the subject	2.51	0.770	0.720	35.3%	34.7%
	b10	Discuss with you how to use ICT for teaching and learning in your lessons	2.52	0.721	0.706	46.2%	32.4%
	b18	Discuss how to use ICT in non-traditional ways for teaching and learning	2.38	0.793	0.705	46.8%	25.4%
	b31	Develop your strategies for teaching with ICT	2.27	0.791	0.702	47.4%	30.6%
	b13	Assist you with using ICT in non-traditional (innovative) ways for teaching and learning	2.51	0.675	0.693	43.4%	27.2%
		Factor 7 – Modelling – ICT (MICT) Cronbach alpha=0.851; Items=2; Mean Scale Score=2.40 (p<.001); Specification=Reflective					
Ho7	b16	Show you how to use ICT for teaching and learning	2.39	0.704	0.709	43.4%	27.2%
	b14	Model how to use ICT for teaching and learning	2.40	0.821	0.649	47.4%	24.9%

The interpretation of the data presented in the tables will be attended to in the discussion section A summary concerning the group statistics related to the ANOVA-test, equality of the group means, and the null hypotheses are presented in Table 7. The results show that the F-ratios and chi-square values were statistically significant ($p < 0.05$). Seven null hypotheses of equal group differences in the dependent variable had to be rejected, favouring the alternative hypotheses.

Table 7. Results of null and alternative hypotheses tests

Latent variable	Null hypotheses				Alternative hypotheses			
	Wilks' lambda	F approx.[a]	P-value	Decision	Pearson's R	Chi-Square	P-value	Decision
PA	.561	134.057**	.000	Reject Ho_1	.663**	173.000	.000	Accept Ha_1
SR	.674	82.727**	.000	Reject Ho_2	.571**	163.685	.000	Accept Ha_2
PK	.607	110.559**	.000	Reject Ho_3	.627**	169.895	.000	Accept Ha_3
M	.524	155.237**	.000	Reject Ho_4	.690**	173.000	.000	Accept Ha_4
F	.666	85.897**	.000	Reject Ho_5	.578**	173.000	.000	Accept Ha_5
PKICT	.765	52.637**	.000	Reject Ho_6	.485**	130.639	.000	Accept Ha_6
MICT	.773	50.304**	.000	Reject Ho_7	.477*	67.760	.000	Accept Ha_7

Lilliefors Corrected. The significance level is 0.05; ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed); Source: Survey data.

Discussion

The alternate hypotheses stating that statistically significant positive relationships exist between a mentor teacher's personal attributes or actions (Ha_1), system requirements (Ha_2), pedagogical knowledge (Ha_3), modelling (Ha_4), feedback (Ha_5), ICT pedagogical knowledge (Ha_6), ICT modelling (Ha_7) and the student teacher's self-efficacy and willingness to return to his/her mentor-teacher (or not to return) were accepted for all seven attributes or roles for both those participants who indicated that they would return to the same mentor and for those who indicated that they would not. The findings thus illuminate the importance of these seven factors or roles which a mentor teacher must fulfil.

The findings related to personal attributes highlight a disturbing trend, as most of the combined "often" and "always" responses to individual items resulted in less than sixty percent. This suggests that mentor teachers will have to be made aware of the personal attributes expected by mentees, as fulfilling these roles is vital (Valenčič Zuljan and Vogrinc, 2007; Du Plessis, 2013; Welch et al., 2013). *Support* (b55), *instilling confidence* (b41, b57) and *positive attitudes* (b11), as well as *addressing teaching anxieties* (b1) are personal attributes that have the potential to promote self-efficacy,

i.e., "people's beliefs in their capabilities to produce desired effects by their own actions" (Bandura, 1997, p. vii). In Maddux's (2002, p. 278) own words, self-efficacy "is what I believe I can do with my skills under certain conditions. It [Self-efficacy] is not concerned with what I believe I *will* do but with what I believe I *can* do" and thus not "I believe I *will* do but what I believe I *can* do."

The verbal persuasion of the mentor as a personal attribute role function could potentially invoke emotional and physiological states, assist with imaginary performance or the visualisation of performance within the classroom space, which could result in potential mastery experiences that promote self-efficacy. The WIL experience is indeed a challenging one, during which the mentee must overcome several difficulties in the learning classroom space because of their inexperience. It is important to build the mentee's self-efficacy through verbal persuasion and interaction by the mentor to promote *'I believe I can do'* thinking, despite the obstacles faced during school-based learning. Personal attributes are valued by mentees (Baartman, 2016) and afford opportunities to promote personal growth (Jita and Munje, 2022), which again could promote self-efficacy.

Regarding system requirements, the Likert scales showed that all but one statement resulted in a score of less than fifty per cent when the results of "often" and "always" were combined: *showing an example of an ATP* (b60), *observing the mentee while teaching* (b17), *explaining school requirements* to the mentee (b48), *explaining the CAPS document* (b19), *explaining the school teacher conduct policy* (b2), *learner disciplinary code* (b62), and *what is expected by the university* (b35). This could potentially fail to develop the participating student teachers' self-efficacy within this dimension and leave them not feeling capable regarding system requirements.

Feedback is an aspect that is mandated by the Faculty of Education and by the Department of Higher Education and Training (2015). The findings showed that although mentees appear to be teaching a great deal, feedback was not provided in all instances and was completely absent in some instances. This became evident as 35.3% indicated that they received feedback between one and five times, 17.9% between 6 and 9 times, and 11% between ten and nineteen times, while 30.1% indicated that no feedback was received. The importance of constructive feedback is stressed by Valenčič Zuljan and Vogrinc (2007), Du Plessis (2013) and Moosa and Rembach (2018); however, the findings seem to concur with Hugo (2018), Baartman (2016) and Moosa and Rembach (2018) that constructive feedback is not always

provided, as shown by the large percentage of mentees who indicated that they did not receive any feedback.

The Likert scale items on feedback showed that, when "often" and "always" were combined, all but two statements resulted in a score of less than 50% per statement. It appears that *lesson plans were seldom reviewed by some of the mentors* (b5), while *oral* (b50) and *written feedback* (b47) was also low. That data suggests that there was also *not great clarity provided on what had to be done to improve* (b15). Overall, the findings suggest that the development of mentees' self-efficacy concerning verbal persuasion related to the mentees' mastery experiences is thus not receiving the attention it should. It is argued that this could also affect the emotional and physiological states (Kram, 1985) of the mentee. This is based on our position that the low frequency of these items suggests that the mentee's self-efficacy perception of *'I can'* despite challenges and unforeseen barriers (Bandura, 1997; Maddux, 2002) is not as well cemented as it could be. If the *'how to improve'* feedback is not explicitly defined, this could negatively impact the development of the mentee's self-efficacy through verbal persuasion. Findings confirm the importance of constructive positive feedback (Hudson, 2004, 2009; Fuentes-Abeledo, González-Sanmamed, Muñoz-Carril and Veiga-Rio, 2020; Pandee, Tepsuriwong and Darasawang, 2020); Martins et al., 2015; Vršnik Perše et al., 2015; Valenčič Zuljan and Marentič Požarnik, 2014), since feedback allows for the promotion of verbal persuasion, which could promote self-efficacy.

The data showed that pedagogical development of the mentees was also not receiving the attention it should have, with *showing content expertise* (b3), *discussing content* (b24), and *assisting to find teaching resources* (b7) as the only items measuring more than 50%. *Showing mentees how to assess* (b49), *providing strategies to solve teaching problems* (b33), *guidance with lesson preparation* (b25), *discussing questioning skills* (b51), *developing the mentee's teaching strategies* (b40), and *assisting with both classroom management strategies* (b53) and *different teaching strategies* (b22) were all below 50%. This picture is of great concern, as it does not depict a positive growth experience regarding learning from the mentors pedagogically; this could impede the personal growth and self-efficacy of mentees. Assisting mentees to develop the above-mentioned aspects is crucial, as this could instil imagining or visualising of self-efficacy experiences related to these aspects (Maddux, 2002; Martins, Costa and Onofre, 2015), which again can influence the mentee's possible implementation of these aspects which then could result in mastery experiences (Bandura, 1997).

Pandee et al. (2020, referencing Woolfolk, Hoy and Spero, 2005) posit that the practicum has the potential to shape and change the self-efficacy of mentees.
It could thus impact their confidence, capabilities and efficacy related to the classroom space if mentors do not provide feedback on the *'how to'*. Valenčič Zuljan and Vogrinc (2007) have posited that an expert teacher might not necessarily be a good mentor to an inexperienced teacher (or mentee), since the expert might not be aware of the goals and roles of a mentor. It is thus possible that some of the mentor-mentee matches were not a good fit because the mentor lacked skills and knowledge of the roles that a mentor must fulfil, and this should be planned for by means of professional development (see Baartman, 2016; Hugo, 2018; Moosa and Rembach, 2018, 2020).
A similar trend was found related to modelling. Only three statements resulted in scores between 50% and 56%: *showing expertise to teach effectively* (b45), *modelling effective classroom management* (b4), and *displaying enthusiasm when teaching* (b48). Statements related to *using hands-on materials* (b37), *modelling different teaching strategies* (b56) and *showing how to teach difficult concepts* all resulted in scores below 50%. The results thus imply that mentors should not underestimate the value of how they teach, i.e., their modelling, as their examples might inculcate certain trends and beliefs in their mentees (see Du Plessis, 2013; Baartman, 2016; Moosa and Rembach, 2018), even beliefs that might negatively influence the mentee's self-efficacy. The importance of observation to promote self-efficacy cannot be underestimated (Bandura, 1997).
ICT pedagogical knowledge and ICT modelling statements were all below fifty percent, ranging between 24% and 35%. It is evident from these results that both modelling and pedagogical instruction related to ICT were experienced as occurring never or rarely. This finding suggests that ICT implementation at schools for teaching and learning appears not to be receiving the attention that it should, which could be attributed to the fact that analysis of data from the Department of Basic Education (2015, 2016) and BusinessTech (2018) shows that most schools in the Eastern Cape Province where this study was undertaken have been denied access to ICT related resources and internet access. The lack of the necessary resources could have contributed to mentors not utilising ICT resources in their classrooms on a wide scale. However, it is also quite possible that many teachers who do have access to resources, might just not use them, as it could be perceived as an unviable means to embrace teaching and learning; there could, for example, be issues related to

complexity, trial capacity, observability, compatibility and relative advantage (Rogers, 2003) which could influence adoption. Nevertheless, it appears that in developed countries such as Slovenia where there is a massive drive to promote ICT usage for teaching and learning, mentoring ICT modelling by mentor teachers remains very low (Ploj Virtič, Du Plessis and Šorgo, 2021), similar to this South African situation. The overall findings showed that within the adapted seven-factor framework, the mentoring experiences concerning role fulfilment by mentors were not ideally conducive, since the overall role experience was scored within the "disagree" to "strongly disagree" scale. Firstly, this is evident from the quantitative Likert scale questionnaire, which showed that most responses related to these seven factors happening "often" or "always", were below fifty percent, and the two factors about ICT were all below thirty-five percent. The findings concur with Zeichner's (1980) position that there is a myth that the practicum has only positive outcomes.

Perhaps it is time to note that less WIL at school could become more if trainees mentees are placed with a mentor who does exhibit most, if not all, the mentoring roles, since mere duration does not imply enhanced learning (Fuentes-Abeledo et al., 2020, citing Capraro, Capraro and Helfeldt, 2010 and citing Ronfeldt and Reininger, 2012). Research by Dlengezele (2020) and Baartman (2016) have found that in many instances, but not all, mentors are not complying with the Hudson Five-Factor framework. The research findings reported in the *'Mentoring research findings in South Africa'* section portray a similar picture related to our seven-factor framework. It is thus important that mentors be informed that mentees want to grow at the level of personal attributes, at the system requirements level, the pedagogical knowledge level, the modelling level, the feedback level, the ICT pedagogical level and the ICT modelling level; however, our findings suggest that this was not the case, which concurs with the findings of Baartman (2016) and Moosa and Rembach (2018) that this is something to be addressed in the South African context. Secondly, it is a great concern that ICT related findings paint a sombre picture, yet the Department of Basic Education (2015, 2016) highlighted ICT usage in schools as a priority. Thirdly, that 31.2% of the participants indicated that they were not prepared to return to the same mentor also raises concern. Fourthly, it is evident that mentors should be better prepared for their mentoring roles, as the results of our findings suggest that this is not the case, and this could be done through greater collaboration between schools and university lecturers (Du Plessis, 2013; Moosa and Rembach, 2020), training for

mentors about their role and its importance (Baartman, 2016; Hugo, 2018) and short courses and workshops (Moosa and Rembach, 2018).

Conclusion and limitations

The findings showed that all seven roles were valued by both those willing to return to their mentor and those who were not. Nevertheless, a significant concern is that a large group of mentees was not prepared to return to their mentor teacher. Our research was unable to provide definitive reasons beyond the results concerning the seven factors. However, the 31.2% could, for example, be attributed to the fact that mentors are insufficiently informed about what is required of them, or (and) it could be ascribed to mentors being unwilling to fulfil a mentoring role, but are *'forced'* to fulfil this role because not enough mentors are available at a particular school, mentors being inexperienced and (or) even mentor teachers not having time to fulfil their mentoring obligations due to curriculum demands, administrative load and (or) the large number of classes for which they are responsible (see Ngibe et al., 2019). At the same time, it could be that an expert teacher is not necessarily a good mentor teacher (Valenčič Zuljan and Vogrinc, 2007), or that experience is overrated, as Feiman-Nemser (1998, p. 64) posits, "experience is not always a reliable or trustworthy teacher". However, it was positive to note that both groups—those willing to return and those unwilling to do so--highly valued the importance of the seven mentoring roles from the hypothesis testing side.

Our research did not measure self-efficacy per se; however, we postulate that WIL has the potential to enhance mastery experiences; observation of mentors promoting mastery experiences, and feedback after lessons could promote verbal persuasion, while the aspects leading up to, during and after a lesson could promote these physiological states (Martins, et al., 2015), thus highlighting the importance of modelling and feedback by the mentor. If what Martins et al. (2015) contend is indeed the case, then regular interaction between mentor and mentee related to the aspects within the adapted seven-factor framework of Hudson (2004, 2009) and Hudson et al. (2005) proves invaluable, as these factors afford opportunities to promote mentee self-efficacy through social persuasion, vicarious experiences, emotional arousal (Bandura, 1997) and imagining or visualising experiences (Maddux, 2002).

It is evident that more exploration of mentoring is required. We propose focusing on research to ascertain what mentor teachers perceive to be their roles, degree of readiness, needs, challenges, and expectations and more student teachers' mentoring experiences. Such findings could highlight perceived experiences and assist in the development of a student and teacher mentoring programme to enhance the interest of those participating.

Finally, the importance of professional development to induct and prepare mentor teachers on a much larger scale must be addressed, otherwise future research results might report similar findings.

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REVIJA ZA ELEMENTARNO IZOBRAŽEVANJE
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UPORABA PODPORNO AVTONOMNEGA ALI KONTROLIRAJOČEGA MOTIVACIJSKEGA STILA POUČEVANJA PRI SPECIALNIH IN REHABILITACIJSKIH PEDAGOGIH

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Izvleček/Abstract

Samodeterminacijska teorija predpostavlja, da motivacijski stil poučevanja pomembno vpliva na motivacijsko naravnanost učencev, na zapomnitev in avtomatizacijo učnih spretnosti in na izobrazbene dosežke. V raziskavo je bilo vključenih 30 specialnih in rehabilitacijskih pedagogov, ki izvajajo dodatno strokovno pomoč v osnovni šoli; ti so izpolnjevali samoocenjevalni vprašalnik, ki temelji na samodeterminacijski teoriji. Ugotovili smo, da je pri specialnih in rehabilitacijskih pedagogih v največji meri prisoten podporno avtonomni stil poučevanja, da prisotnost posamezne lastnosti ne pogojuje prisotnosti druge in da glede na leta delovnih izkušenj ni razlike v uporabi stila.

Use of autonomy-supportive or controlling motivational style of teaching with special education and rehabilitation teachers

Self-determination theory assumes that the motivational teaching style significantly influences the motivational orientation of students, as well as their memorization, automation of learning skills and educational achievements. The research included 30 special education and rehabilitation teachers, who provide additional professional assistance in primary school and who were asked to complete a self-evaluation questionnaire based on self-determination theory. The following facts were ascertained: the autonomy-supportive style of teaching prevails; the presence of one characteristic does not condition the presence of another characteristic; and the use of style does not depend on the years of experience.

Ključne besede:
samodeterminacijska teorija, podporno avtonomni stil poučevanja, kontrolirajoči stil poučevanja, specialni in rehabilitacijski pedagogi, učenci s specifičnimi učnimi težavami

Keywords:
self-determination theory, autonomy-supportive teaching style, controlling teaching style, special education and rehabilitation teachers, students with specific learning difficulties

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Teoretična izhodišča

Teorija samodeterminacije (v nadaljevanju SDT) je makroteorija, ki analizira, do katere mere je posameznikovo vedenje samodeterminirano, kar pomeni, da analizira, do katere mere se posameznik samostojno odloča za doseganje svojih ciljev ter kako in koliko ob tem reflektira ter ozavešča svoje misli (Deci in Ryan, 1985). SDT zajema šest podteorij, ki pojasnjujejo različne vidike motivacije in osebnosti (Ryan in Deci, 2000; Ryan in Deci, 2017): 1) teorija kognitivne evalvacije – opredeli dejavnike, ki vplivajo na motivacijo (zunanje spodbude ali možnosti lastne izbire); 2) organizmična integracijska teorija – obravnava zunanjo motivacijo v različnih oblikah glede na njene lastnosti, determinante in posledice; 3) teorija vzročne usmeritve – obravnava individualne razlike med posamezniki glede regulacije vedenja; 4) teorija o življenjskih ciljih – zajema notranje in zunanje cilje ter njihov vpliv na posameznikovo motivacijo in dobro počutje; 5) motivacijska teorija socialne povezanosti – pojasnjuje, da socialna povezanost ni dovolj za zagotavljanje kakovostnih medosebnih odnosov, je pa pomembna za doživljanje psihičnega blagostanja; 6) teorija osnovnih psiholoških potreb – pojasnjuje, da so vse tri psihološke potrebe (po avtonomiji, kompetenci in po socialni povezanosti) pomembne; ob oviranosti le ene izmed njih, se pri posamezniku pojavijo težave.
SDT presega delitev motivacije na: 1) notranjo, avtonomno (intrinzično) motivacijo, ki je pogojena z osebnim užitkom ali zanimanjem (Ryan, 2016), kjer je aktivnost že sama po sebi nagrada; vedenje izvira iz radovednosti in interesa; 2) zunanjo (ekstrinzično) motivacijo, za katero je značilno, da cilj ni aktivnost sama po sebi, ampak to, kar bo aktivnost prinesla; posameznik deluje zaradi posledic, da bi dobil nagrado ali se izognil kazni. SDT govori o motivacijskem kontinuumu (Ryan in Deci, 2009), ki poteka od faze brez regulacije (amotivacija), kjer je prisotna najnižja stopnja avtonomije, preko eksternalne regulacije, introjicirane regulacije, identificirane regulacije, integrirane regulacije do faze notranje regulacije (motivacije), kjer je prisotna najvišja stopnja avtonomije. Učitelji lahko učence spodbudijo k učenju na kateri koli točki kontinuuma, in sicer k čim bolj integriranemu stilu uravnavanja učenja. To pomeni, da je možno predvideti, da se bo učenec, ki je zunanje motiviran, na začetku kake učne vsebine ob ustreznih zunanjih spodbudah med samim procesom poučevanja tako zatopil v delo, da bo v njem vztrajal tudi kasneje, ne glede na obstoj zunanjih spodbud (Juriševič, 2012).

SDT nudi pomemben vpogled glede povezovanja okoljskih dejavnikov z motivacijo, in sicer če okolje zadovoljuje potrebe posameznika po avtonomiji in kompetenci, spodbuja in zvišuje njegovo motivacijsko naravnanost, se kaže rezultat v visoko motiviranem vedenju posameznika (Reeve in Cheon, 2021; Ryan in Deci, 2020; Ryan in Weinstein, 2009). Velja pa tudi nasprotno, če okolje ne zadovoljuje posameznikovih osnovnih psiholoških potreb (po avtonomiji, kompetenci in po socialni povezanosti), postaja posameznik za določeno aktivnost vse manj motiviran (Liu idr., 2016; Ryan in Deci, 2020). Okoljske dejavnike razvršča v dve skupini: prve, ki spodbujajo avtonomijo, in druge, ki spodbujajo kontrolo, s čimer sta povezana podporno avtonomni in kontrolirajoči stil poučevanja. Učitelji, ki spodbujajo avtonomijo, spodbujajo tudi učenčevo intrinzično motivacijsko naravnanost (Deci idr., 1981), ponotranjanje (Ryan in Grolnick, 1986), krepijo konceptualno učenje (Grolnick in Ryan, 1987) in kreativnost (Koestner idr., 1984) med normativno populacijo in populacijo oseb s posebnimi potrebami (Deci idr., 1992). Učitelji, ki spodbujajo avtonomijo, uporabljajo nekontrolirajoči jezik, sporočajo o pomenu nalog, utemeljijo zahtevana vedenja in spodbujajo izbiro metod za doseganje ciljev (Reeve, 2016; Reeve idr., 2004; Reeve idr., 2003; Reeve in Cheon, 2021) ter doživljajo večje delovno zadovoljstvo (povzeto po Abushariju, 2012). Ti učitelji sodelujejo pri reševanju učenčevih motivacijskih težav na način, da upoštevajo učenčeve interese, prednostna področja, spodbujajo njihovo radovednost, izbiro nalog in učnih strategij, dovolijo napake, vnašajo novosti, se ne bojijo sprememb, se z izjavami učencev ne obremenjujejo ter dopuščajo iskanje različnih rešitev (Reeve, 2016; Reeve idr., 1999; Reeve idr., 2004). Učitelji, ki uporabljajo kontrolirajoči stil poučevanja, sodelujejo pri reševanju učenčevih motivacijskih težav na način, da nudijo direktivna navodila, ne upoštevajo učenčevih notranjih virov moči, aktivnosti časovno omejujejo, zahtevajo opravljanje nalog, govorijo o posledicah in učence obremenijo z dodatnimi nalogami (prav tam). Učenci učiteljev, ki uporabljajo kontrolirajoči stil, so učinkoviti le v prisotnosti zunanjega vira kontrole – učitelja; ob učiteljevi odsotnosti učenčeva učinkovitost upade (prav tam); zaznana sta tudi upad učenčeve avtonomne motivacijske naravnanosti in manj učinkovita uporaba metakognitivnih strategij (Soenens idr., 2012). Učenci s težjimi in težkimi oblikami specifičnih učnih težav (v nadaljevanju: SUT), ki se imenujejo primanjkljaji na posameznih področjih učenja (v nadaljevanju: PPPU), so po Zakonu o usmerjanju otrok s posebnimi potrebami (2011) upravičeni do usmeritve v *Izobraževalni program s prilagojenim izvajanjem in dodatno strokovno pomočjo*.

Potrebujejo: 1) dodatno strokovno pomoč (v nadaljevanju: DSP), ki jo izvajajo za premagovanje primanjkljajev, ovir oz. motenj, najpogosteje specialni in rehabilitacijski pedagogi (v nadaljevanju: SRP), poleg njih pa tudi pedagogi, psihologi, logopedi, inkluzivni pedagogi in socialni pedagogi; in/ali 2) učno pomoč, ki jo izvajajo učitelji na svojem predmetnem področju, če so se izpopolnjevali za delo z učenci s posebnimi potrebami. SRP izvajajo v sodelovalnem odnosu z učencem pomoč, ki je namenjena premagovanju primanjkljajev, ovir oz. motenj, ki so nevropsihološko in nevrofiziološko pogojene (Magajna idr., 2008). Znotraj DSP korigirajo primarne primanjkljaje, ovire oz. motnje, sekundarne čustvene in vedenjske težave, krepijo ustrezne kompenzatorne, učne, motivacijske, kognitivne, metakognitivne spretnosti in izvršilno funkcioniranje ter spodbujajo razvoj močnih področij, področij potencialov, to pa je opredeljeno v individualiziranem programu. V individualiziranih programih je treba opredeliti metode in strategije dela znotraj ur DSP, kar se sklada z ugotovitvami, objavljenimi v Končnem poročilu Evalvacije različnih oblik dodatne strokovne pomoči, ki je otrokom dodeljena skladno z Zakonom o usmerjanju otrok s posebnimi potrebami (Vršnik Perše idr., 2016), tj. da so v individualiziranih programih najslabše opredeljene strategije in metode za delo z učenci, z opredeljenimi cilji za učno pomoč in s cilji za svetovalno storitev, ter z raziskavo Licardo in Schmidt (2012), da je v večini primerov zadovoljena zakonska zahteva po izdelavi individualiziranega programa, vendar evalvacije individualiziranih programov niso ciljno usmerjene, prav tako ni preverjena celotna realizacija individualiziranega programa. Avtorici sta izpostavili, da več kot polovica analiziranih individualiziranih programov ni imela oblikovanih in zapisanih ciljev, ki bi razvijali spretnosti in strategije za obvladovanje težav, prav tako ni bil zapisan niti en cilj s področij samoodločanja, opolnomočenja, samozagovorništva in samousmerjanja, kar je skladno z ugotovitvami avtorice Černe (2020).

Učitelj za učence z učnimi in s specifičnimi učnimi težavami delo v razredu individualizira in diferencira, kar je skladno z načeli, ki spodbujajo samodeterminacijo (samoodločanje in samodoločanje) in so opredeljena v strokovnem dokumentu Koncept dela: Učne težave v osnovni šoli (Magajna idr., 2008). Načela udeleženosti učenca, spodbujanja intrinzične motivacijske naravnanosti in samodeterminacije so temeljna načela pri načrtovanju DSP (npr. sprejemanje in podpiranje pobud učenca in omogočanje izbire pri učenju in različnih oblikah pomoči) (Licardo, 2015; Licardo in Schmidt, 2012; Licardo in Schmidt, 2014).

Implementacija načel samodeterminacije in samozagovorništva v šolski prostor predstavlja spremenjen pogled na učenca na sistemski ravni (prav tam; Magajna idr., 2008; Mrvčić, 2016), kar je posebno pomembno razumeti v kontekstu učencev s SUT.

SUT imajo skupne značilnosti, ki se kažejo z zaostankom v zgodnjem razvoju ali v izrazitejših težavah na področjih pozornosti, pomnjenja, mišljenja, koordinacije, komunikacije, branja, pisanja, pravopisja, računanja, socialne kompetence in čustvenega dozorevanja (prav tam). SUT se sopojavljajo z drugimi učnimi motnjami v različnih kombinacijah in jakostih (Angold idr., 1999; Desoete, 2008; Pauc, 2005; Pennington, 2006; Willcutt idr. 2006). Učenci s SUT lahko izkazujejo primanjkljaje na področju povezovanja informacij in celostnega razumevanja ter odstopanja v samoučinkovitosti (Baird idr., 2009). Odstopanja se pojavljajo tudi pri uporabi samoregulacijskih strategij; prisotne so manj učinkovite motivacijske strategije (Sideridis, 2009), npr.: strategije defenzivnega pesimizma, naučene nemoči in pasivnosti v učnem procesu (Černe, 2020; Černe in Juriševič, 2018a; Sideridis, 2009), zunanji lokus kontrole (Park, 2011) in odstopanja v metakognitivnem zavedanju bralnih učnih strategij (Černe in Juriševič, 2018b; Roth, 2008). Poleg navedenega v učnem procesu izkazujejo manj upanja (Lackaye idr., 2006), zato je treba med poukom in izvajanjem DSP zagotoviti pogoje za njihovo samomotivacijo.

Raziskovalni problem in raziskovalno vprašanje

Čeprav se zdi, da je v kontekstu izobraževanja zunanje opolnomočenje manj ustrezno, je pomembno, da se zavedamo njegovega vpliva pri nudenju povratnih informacij, postavljanju ciljev, pri ocenjevanju znanja in zunanjem preverjanju znanja. Ob tem se je treba zavedati vpliva in pomena intrinzične motivacijske naravnanosti ter jo v kombinaciji z ekstrinzično motivacijsko naravnanostjo krepiti, za kar pa je pomembno, da SRP pre(poznajo) lasten motivacijski stil poučevanja in ga v procesu krepitve profesionalnih kompetenc znotraj intervencijskih treningov po potrebi tudi spremenijo (Reeve in Cheon, 2021; Reeve in Cheon, 2014; Reeve idr., 2003). Raziskovalne ugotovitve namreč poudarjajo pomemben vpliv podporno avtonomnega stila poučevanja na krepitev učenčeve intrinzične motivacijske naravnanosti (Hofferber idr., 2016; Reeve, 1998; Reeve 2016; Reeve idr., 1999), pridobivanje kakovostnejšega znanja (Järvelä in Niemivirta, 2001), na zapomnitev, učenje in avtomatizacijo učne snovi pri učencih s SUT, na kar opozarja tudi SDT (Deci idr., 1992; Deci in Ryan, 1985; Deci in Ryan, 2017).

Koncept avtonomije, ki je v SDT osrednjega pomena, je namreč prepoznan kot temeljni dejavnik pri spodbujanju ustrezne motivacijske naravnanosti učitelja in učenca (Niemiec in Ryan, 2009; Reeve in Cheon, 2021; Ryan in Deci, 2020; Ryan in Weinstein, 2009). Izkušnja avtonomije, kompetence in socialne povezanosti vpliva na posameznikovo samodeterminirano, avtonomno motivacijsko naravnanost (Ryan in Deci, 1985; Wang idr., 2016).

V raziskavi nas je zanimala samoocena SRP glede lastnega motivacijskega stila poučevanja učencev s SUT znotraj ur DSP (ali gre za podporno avtonomni ali za kontrolirajoči stil) in če se pojavljajo razlike v letih delovnih izkušenj glede uporabe stila poučevanja.

Glede na opredeljen raziskovalni problem smo oblikovali naslednji raziskovalni vprašanji:

1. Kakšna je samoocena SRP glede uporabe motivacijskega stila poučevanja (pretežno podporno avtonomnega ali kontrolirajočega) znotraj DSP?
2. Ali obstoja razlika v letih delovnih izkušenj SRP glede uporabe motivacijskega stila poučevanja?

Metoda

Udeleženci

V raziskavo je bilo z namenskim vzorčenjem vključenih 30 SRP z 11 osnovnih šol iz različnih statističnih regij po državi, in sicer v okviru širše raziskave o Vplivu tipa intervencijskega treninga na učno motivacijo mlajših mladostnikov z disleksijo, ki jo je vodila Černe (2020). SRP so bili v večini ženskega spola (Moška oblika tukaj velja za moški in ženski spol). SRP so imeli od enega leta do 35 let delovnih izkušenj, v povprečju pa 12,4 leta (SD = 6,87); 10 let ali manj delovnih izkušenj je imelo 53,6 % SRP. Vsi SRP so pridobili najmanj VII. stopnjo izobrazbe. Vključeni SRP so izvajali DSP z učenci zadnjega triletja osnovne šole, ki so bili kot otroci s primanjkljaji na posameznih področjih učenja usmerjeni v izobraževalni program s prilagojenim izvajanjem in dodatno strokovno pomočjo.

Viri podatkov

V raziskavi smo uporabili samoocenjevalni vprašalnik težav v šoli (angl. The Problems in Schools Questionnaire, Deci idr., 1981).

Sestavljen je iz 32 postavk, opisa osmih situacij, ki se nanašajo na vprašanja, povezana s šolskimi situacijami, in iz štirih mogočih odzivov na vsako izmed njih, ki so razvrščene v naslednje kategorije: močna avtonomija, zmerna avtonomija, močen nadzor, zmeren nadzor.

SRP se na 7-stopenjski lestvici (1 – povsem neprimerna rešitev, 7 – zelo primerna rešitev) za vsako situacijo odloči, katera rešitev se mu zdi najprimernejša, in jo na lestvici razvrsti.

V kontekstu zanesljivosti merjenja smo izvedli analizo notranje skladnosti posameznih dimenzij vprašalnika. Vrednost Cronbachovega alfa za močno avtonomijo ($\alpha = 0{,}733$) in zmerno avtonomijo ($\alpha = 0{,}741$) kaže na zadovoljivo notranjo skladnost, medtem ko sta vrednosti Cronbachovega alfa kot indikatorja za notranjo skladnost pri dimenzijah zmerni nadzor ($\alpha = 0{,}562$) in močen nadzor ($\alpha = 0{,}577$) pod še sprejemljivo mejo. Deloma je možno tak izid pripisati majhnosti vzorca, ki podceni dejansko notranjo konsistentnost dimenzij. Deci idr. (1981, v Košir in Kos Strašek, 2015) sicer poročajo o zadovoljivi notranji skladnosti posameznih dimenzij vprašalnika (od 0,63 do 0,80) in ustreznem koeficientu zanesljivosti postopka *test–retest* (0,70 za celotno lestvico, od 0,77 do 0,82 za posamezne dimenzije).

Vprašalnik smo priredili za potrebe te raziskave. V osebnem stiku z avtorji (konferenca Self Determination Theory, Victoria, 2016) smo pridobili soglasje za uporabo vprašalnika, potem pa smo vprašalnik prevedli in ga preverili s skupino treh SRP, ki imajo različno stopnjo izobrazbe in različno število let delovnih izkušenj ter s tem zagotovili ekspertno veljavnost.

Zbiranje podatkov

Vprašalnik so SRP izpolnjevali v šolskem letu 2017/18, in sicer v prostorih Svetovalnega centra za otroke, mladostnike in starše Ljubljana oktobra in novembra. Izpolnjevanje je trajalo 15 minut. Upoštevali smo Etični kodeks za raziskovalce Univerze v Ljubljani in Načela kodeksa etike na področju družboslovja. V sklopu širše raziskave smo 30. 8. 2017 pridobili sklep Komisije za etiko za izvedbo raziskave.

Obdelava podatkov

Pri vsakem SRP smo za vsako izmed štirih merjenih dimenzij sešteli vrednosti odgovorov. Seštevki so se gibali v razponu od 8 do 56. Po vsaki izmed merjenih dimenzij smo SRP uvrstili v tri skupine s približno enakim razponom vrednosti (preglednica 1).

Preglednica 1. Pregled razvrstitve merjenih dimenzij v skupine

Prva skupina – SRP, pri katerih so se seštevki odgovor pri posamezni dimenziji gibali med vrednostima 8 in 24. Metjena lastnost je bila prisotna v manjši meri – šibka prisotnost lastnosti.
Druga skupina – SRP, pri katerih so se seštevi odgovor pri posamezni dimenziji gibali med vrednostima 25 in 40. Merjena lastnost je bila srednje prisotna.
Tretja skupina – SRP, pri katerih so se seštevki odgovor pri posamezni dimenziji gibali med vrednostima 41 in 56. Merjena lastnost je bila močno prisotna.

Za prikaz prisotnosti posamezne merjene lastnosti pri SRP smo uporabili mere opisne statistike. Medsebojno povezanost posamezne merjene lastnosti (močen nadzor, zmeren nadzor, močna avtonomija, zmerna avtonomija) smo preverili z analizo korelacij, pri čemer smo pri interpretaciji upoštevali vrednost Pearsonovega korelacijskega koeficienta, ki smo ga uporabili tudi v analizi povezanosti med posamezno merjeno lastnostjo in delovnimi izkušnjami izvajalcev.

Rezultati z razpravo

Prisotnost merjenih lastnosti pri SRP

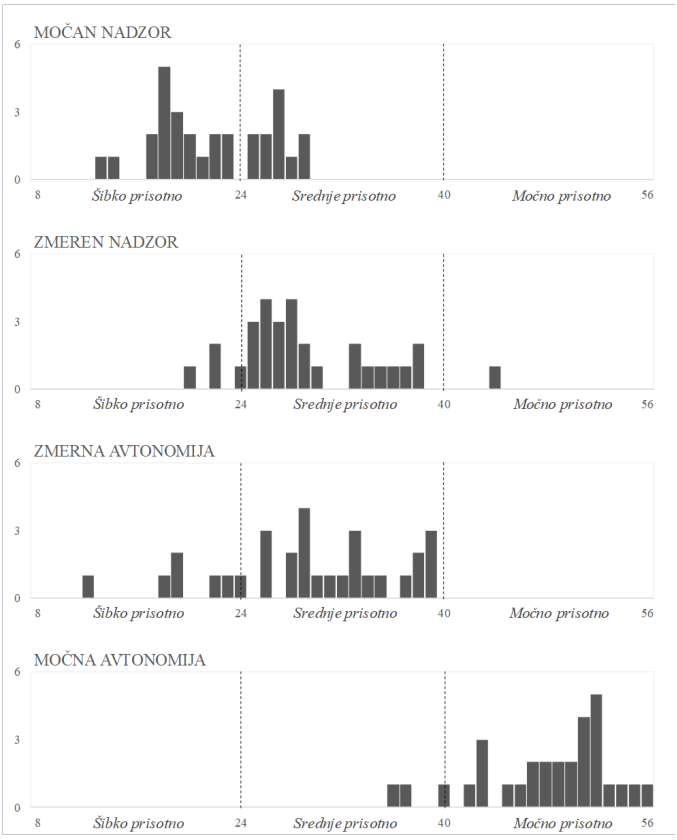
Med SRP je bila izmed merjenih lastnosti v največji meri prisotna močna avtonomija; pri večini SRP je šlo za močno prisotnost te lastnosti (slika 1, preglednica 2). Zmeren nadzor in zmerna avtonomija sta bila najpogosteje pri SRP izražena srednje močno (na sliki 1 vidimo zgoščanje vrednosti na sredini), izjemoma močno, v manjši meri pa šibko. Na drugi strani je bil močen nadzor šibko izražen pri slabih dveh tretjinah SRP, pri nobenem pa nismo zasledili močne prisotnosti.

Reeve (1998) navaja tri ključne dejavnike razlik med podporno avtonomnim stilom in kontrolirajočim stilom poučevanja: 1) osebnostni dejavniki; 2) naučene spretnosti, ki spodbujajo avtonomijo; 3) socialni kontekst, kar se sklada tudi z ugotovitvami Abusharija (2012), ki je raziskoval delovno zadovoljstvo med SRP in prišel do rezultatov, da omenjeni kader dosega precej visoko stopnjo delovnega zadovoljstva, ki je povezano s podporno avtonomnim stilom poučevanja.

Preglednica 2. Opisne statistike prisotnosti posamezne merjene lastnosti (n = 30)

					PRISOTNOST LASTNOSTI		
	Min.	**Maks**	**M**	**SD**	**šibka**	**srednja**	**močna**
					f %	**f %**	**f %**
MN	13	29	21,83	4,534	19 (63,3 %)	11 (36,7 %)	0 (0 %)
ZN	20	44	29,20	5,561	4 (13,3 %)	25 (83,3 %)	1 (3,3 %)
ZA	12	39	29,27	6,938	7 (23,3 %)	23 (76,7 %)	0 (0 %)
MA	36	56	48,17	5,100	0 (0 %)	3 (10,0 %)	27 (90,0 %)

Opomba: MN – močen nadzor, ZN – zmeren nadzor, ZA – zmerna avtonomija, MA – močna avtonomija, Min. – najmanjša vrednost; Maks. – največja vrednost; M – povprečna vrednost (aritmetična sredina); SD – standardni odklon



Slika 1. Frekvenčna distribucija seštevka odgovorov pri posamezni dimenziji (n = 30)

Medsebojna povezanost merjenih lastnosti in njihova povezanost z delovnimi izkušnjami
Korelacijska analiza je pokazala, da pri SRP prisotnost posamezne lastnosti ni nujno pogojevala prisotnosti drugih. Močno izražena avtonomija pri konkretnem SRP ni povedala ničesar o tem, kako močno bo izražena zmerna avtonomija, zmerni nadzor ali močen nadzor pri tem SRP. Podobno je veljalo za zmerno avtonomijo, delno pa tudi za zmeren in močen nadzor. Izjema pri tem je bila le povezanost med zmernim in močnim nadzorom, pri čemer je obstajala srednje močna statistično značilna povezanost ($p < 0,01$). Ugotavljamo, da sta bili lastnosti močnega in zmernega nadzora pri SRP povezani (preglednica 3).
Med delovnimi izkušnjami SRP in prisotnostjo posamezne merjene lastnosti pri njih nismo ugotovili statistično značilne povezanosti, kar je skladno z ugotovitvami Pirnat (2012), ki je raziskovala motivacijsko usmerjenost učiteljev 5. razreda, in v nasprotju z ugotovitvami Abusharija (2012), tj. da mlajši SRP dosegajo višjo raven delovnega zadovoljstva, ki je povezana z lastnostmi podporno avtonomnega stila poučevanja.

Preglednica 3. Korelacijska matrika medsebojne povezanosti merjenih lastnosti in njihova povezanost z delovnimi izkušnjami izvajalcev DSP

	Močen nadzor	**Zmeren nadzor**	**Zmerna avtonomija**	**Močna avtonomija**
Močen nadzor	–	,494**	–,109	,210
Zmeren nadzor		–	,017	,210
Zmerna avtonomija			–	–,042
Močna avtonomija				–
Delovne izkušnje (leta)	,030	,036	,311	–,235

** $p < 0,01$

Sklep

V prispevku smo raziskali samooceno SRP glede lastnega motivacijskega stila poučevanja učencev s SUT znotraj ur DSP (ali gre za podporno avtonomni ali za kontrolirajoči stil), ki je opredeljen v samodeterminaciji (Deci idr., 1992; Deci in Ryan, 1985).

Samoocena SRP glede lastnega motivacijskega stilapoučevanja nas je zanimala, ker: 1) kognitivni primanjkljaji, značilni za SUT, pri učencih vztrajajo skozi celotno osnovnošolsko obdobje, zato potrebujejo neprekinjeno obravnavo SRP; 2) je sopojavnost motenj prej pravilo kot izjema (Kaplan idr., 2001), kar otežuje korekcijo in kompenzacijo primanjkljajev, zato potrebujejo učenci s SUT podporo pri krepitvi avtonomne motivacijske naravnanosti, s katero naj bi vplivali na lastno samoregulacijsko učenje in posledično dosegali realne izobrazbene dosežke. Za krepitev lastne motivacijske naravnanosti učenci s SUT potrebujejo podporo SRP, ki uporablja podporno avtonomni stil poučevanja (povzeto po Niemiec in Ryan, 2009; Reeve in Cheon, 2021; Ryan in Weinstein, 2009).

Na raziskovalno vprašanje, kakšna je samoocena SRP glede uporabe motivacijskega stila poučevanja (ali gre za podporno avtonomni ali za kontrolirajoči stil) znotraj DSP, odgovarjamo, da SRP samoocenjujejo, da pri poučevanju učencev s SUT uporabljajo pretežno podporno avtonomni stil.

Na raziskovalno vprašanje, ali obstaja razlika v letih delovnih izkušenj glede motivacijskega stila poučevanja, odgovarjamo, da med SRP z manj ali več leti delovnih izkušenj nismo ugotovili pomembnih razlik, prav tako nismo ugotovili pomembnih razlik v uporabi motivacijskega stila poučevanja. Pokazala pa se je srednje močna statistično značilna povezanost med kategorijama zmernega in močnega nadzora.

Ugotovitve raziskave so skladne s paradigmatskimi premiki, ki nastajajo v zadnjih letih na področju razumevanja SUT. Gre za premike od modela primanjkljajev in motenj (angl. disabilities model), ki se osredinja na učenčeve deficite, k modelu rezilientnosti, ki poudarja učenčeva močna področja in uspehe (Margalit, 2004).

Za krepitev podporno avtonomnega stila poučevanja je treba pri izvedbi DSP v prihodnje krepiti elemente samodeterminacijskega učenja in vedenja (Loman, idr. 2010; *Wehmeyer, idr. 2007)* in sicer: 1) spodbujati učence pri osmišljanju ciljev, pri razdelitvi oddaljenih in obsežnih ciljev na manjše, lažje dostopne in preverljive (*Wehmeyer, idr. 2007)*; 2) podpirati učence pri sprejemanju lastnih šibkih področij in neusvojenih spretnosti; 3) spodbujati učence pri iskanju ustrezne pomoči (Doll idr., 1996; *Wehmeyer, idr. 2007*); 4) spodbujati učence k opazovanju individualnega truda, napredka, in sicer brez primerjav z drugimi; spodbujati njihovi samozavedanje in samoiniciativnost (Bierman, 2004; Ryan, 2016); 5) poučevati strategije reševanja problemov in samoregulacijske veščine, ki vsebujejo: samoinštrukcije, samoopazovanje, samoojačevanje in samoevalvacijo (Wehmeyer in Field, 2007); 6) spodbujati učence pri razvoju avtonomne motivacijske naravnanosti, ki posledično

povečuje podporno avtonomni stil poučevanja SRP (povzeto po Reeve, 2016; povzeto po Reeve in Cheon, 2021).

Uporabno vrednost raziskave razumemo v ozaveščanju in opozarjanju na pomen podporno avtonomnega stila poučevanja učencev s SUT, z zavedanjem, da je v intervencijskih pristopih SRP še vedno pomembno prisotna behavioristična paradigma, ki z uporabo različnih metodično-didaktičnih pristopov krepi ekstrinzično motivacijsko naravnanost učencev s SUT (Černe, 2020).

Omejitve raziskave vidimo v uporabi le enega načina pridobivanja podatkov – samoocenjevalnega vprašalnika. Pomembnejši prispevek bi bil dosežen ob uporabi triangulacije virov in metod glede zaznav učencev o spodbujanju avtonomije pri SRP ter samozaznav SRP ali glede neposrednega vpliva spodbujanja avtonomije na izobrazbene dosežke učencev s SUT, ob upoštevanju različnih okoljskih spremenljivk. Prav tako bi bili raziskovalni rezultati lahko drugačni na večjem vzorcu SRP in tudi učencev s SUT, ki bi jih lahko posplošili.

V prihodnje bi bilo smiselno raziskati neposredno vzročno-posledično povezavo med učenčevo intrinzično motivacijsko naravnanostjo in stilom poučevanja SRP, s čimer se strinja tudi Fernet idr. (2012), ter upoštevati raznolike dejavnike, ki vplivajo na avtonomno motivacijsko naravnanost učenca in tudi SRP ter izvajalca DSP (npr.: stil vodenja, pritisk delovnega okolja, šolska klima in miselnost učitelja) (Dweck, 2000; Kingma, 2016; Pelletier in Rocchi, 2016; Pelletier idr., 2002; Pelletier idr., 2009; Pelletier idr., 2016; Pirnat, 2012).

Glede na zahtevne aktualne pogoje poučevanja se kaže tudi potreba po sistematičnem dodiplomskem in podiplomskem ter nadaljnjem izobraževanju in usposabljanju prihodnjih generacij SRP, ki bodo s poznavanjem in z izvajanjem ustrezne kombinacije pristopov behavioristične, humanistične, kognitivistične, konstruktivistične in sociokulturne paradigme pri pouku ter znotraj DSP krepile učenčevo aktivno učenje in avtonomno učno delovanje z vidikov učne organizacije, samoregulacijskega učenja, izbire ustreznih kognitivnih, metakognitivnih in motivacijskih strategij ter krepili lastno delovno zadovoljstvo. Usposabljanje učiteljev za podporo pri razvoju učenčeve avtonomije v okviru SDT prinaša pomembne učinke, ki so povezani s profesionalnim zadovoljstvom in z razvojem ter zmanjšanjem pojavljanja čustvenih, psihosomatskih in somatskih težav (Cheon idr., 2014; Ryan in Deci, 2017; Reeve in Cheon, 2021) ter vpliva na avtonomno motivacijsko naravnanost učencev (Chang idr., 2017; Reeve and Cheon, 2021).

Summary

In this article, we investigated self-evaluation among SRT regarding their motivational style of teaching students with SLD within APA classes (i.e., the autonomy-supportive or controlling style of teaching), as defined by SDT (Deci et al., 1992, Deci and Ryan, 1985). The SRT self-evaluation of their motivational teaching style became our focus because of the following two issues: 1) cognitive deficits characteristic of SLD students persist throughout primary school, which is why these students require continuous treatment by SRT; 2) the co-occurrence of disorders is the rule rather than the exception (Kaplan et al., 2001), which hinders correction of and compensation for deficits. SLD students therefore need assistance to strengthen their autonomous motivation, which will further influence their self-regulated learning and, as a consequence, their learning achievements. To strengthen their autonomous motivation, SLD students need assistance from SRT with an autonomy-supportive teaching style (Niemiec and Ryan, 2009; Reeve and Cheon, 2021; Ryan and Weinstein, 2009)

To the research question about the self-assessment by SRT regarding the use of a motivational teaching style (mostly supportive-autonomous or controlling) in APA, we provided the following answer: According to this self-evaluation, it is mainly the autonomy-supportive style of teaching that is used when teaching SLD students.

Does the motivational style of teaching depend on the length of teaching experience? This research question yielded the following answer: There were no significant differences identified between senior and junior teachers, nor did we find any significant differences in their choice of teaching style. There was, however, a moderately strong statistically significant relation between the categories of moderate and strong control. The findings of the research are in line with recent paradigm shifts in the field of SLD comprehension. In recent years, there has been a shift from the disability model, which focuses mainly on student deficits, to the resilience model, which highlights student strengths and achievements (Margalit, 2004).

To strengthen the autonomy-supportive teaching style in the future, APA implementation should reinforce the following elements of self-determination learning and behaviour (Loman, et al. 2010; Wehmeyer, et al. 2007): 1) encourage

students to give meaning to their goals and transform long-term and large-scale goals into more modest, attainable and verifiable goals (Wehmeyer, et al. 2007); 2) help students accept their weak areas and unlearned skills; 3) encourage requests for assistance when needed (Doll et al., 1996; Wehmeyer, et al. 2007); 4) encourage students to observe every effort and progress, without comparison to others, encourage their self-awareness and self-initiative (Bierman, 2004; Ryan, 2016); 5) teach them problem-solving strategies and self-regulatory skills, including self-instruction, self-observation, self-empowerment and self-evaluation (Wehmeyer and Field, 2007); 6) encourage students to develop autonomous motivation, which consequently increases the autonomy-supportive teaching style of SRT (according to Reeve, 2016; according to Reeve in Cheon, 2021).

The utility of the study mainly concerns its role in raising awareness of and drawing attention to the importance of the autonomy-supportive teaching style with SLD students. We should be aware that the behavioural paradigm remains present in the intervention approaches of SRT, which strengthens extrinsic motivation among SLD students.

The major limitation of this study lies in the fact that only one method of data collection was used: the self-assessment questionnaire. A more significant contribution could be achieved by triangulating sources and methods when investigating students' perception of encouraging SRT autonomy, and the self-perceptions of SRT, or when investigating the direct relation between encouraging autonomy and the academic achievement of SLD students, with diverse environment variables considered. The research results would also be different with a larger sample of SRT and SLD students available for generalisation.

In the future, direct cause-consequence analysis of the relation between student's intrinsic motivation and the SRT teaching style should be carried out, as highlighted by Fernet et al., 2012, additionally considering the diverse factors influencing the autonomous motivation of both the student and the SRT implementing APA (e. g. leadership style, work environment pressure, school atmosphere and the teacher's mindset) (Dweck, 2000; Kingma, 2016; Pelletier and Rocchi, 2016; Pelletier et al., 2002; Pelletier et al., 2009; 2016 Pirnat, 2012).

Given the demanding current teaching conditions, a growing need has arisen for systematic education and training (at both undergraduate and post-graduate levels, as well as in further education) of future generations of SRT who will strengthen the

student's active learning process and autonomous learning activities as regards learning organization, self-regulated learning and selection of appropriate cognitive, metacognitive and motivational strategies, and who will also increase their own job satisfaction by mastering and implementing the right combination of behavioural, humanistic, cognitive, constructive and sociocultural paradigm methods and approaches, when implementing intervention training in the regular class and in APA. Training teachers to support the development of student autonomy within SDT will yield many outcomes related to professional satisfaction and development as well as the reduction of emotional, psychosomatic and somatic problems (Cheon et al., 2014; Ryan and Deci, 2017; Reeve and Cheon, 2021) and affects the autonomous motivation of students (Chang et al., 2017; Reeve and Cheon, 2021).

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A Canonical Correlation Analysis: Learning Preferences and Sensory-Specific English Learning Material Stimuli

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Abstract/Izvleček The study investigated the relationship between sensory-specific English learning material stimuli and sensory learning preferences. The study involved 53 English as a foreign language participants. Participants were provided with different sensory-specific English learning material stimuli to analyse their overall comprehension. A canonical correlation analysis was used to analyse the collected data statistically. Auditory learning preference was significantly related to adaptive English learning stimuli (paper texts with sound, images with captions, and sound with images). The canonical correlation coefficient of .665 indicated 44.2% of the variance in English learning was determined by learners with auditory learning preferences and adaptive learning materials.

Kanonično-korelacijska analiza: učne preference in senzorično specifični dražljaji učne snovi angleščine

Študija je preučevala razmerje med senzorično specifičnimi dražljaji učnega gradiva za angleščino in senzoričnimi učnimi preferencami. Vključevala je 53 udeležencev angleščine kot tujega jezika, ki so prejeli različne senzorično specifične dražljaje učnega gradiva za angleščino, da bi analizirali njihovo splošno razumevanje. Za statistično analizo zbranih podatkov je bila uporabljena kanonično-korelacijska analiza. Preferenca slušnega učenja je bila pomembno povezana s prilagodljivimi dražljaji za učenje angleščine (besedila na papirju z zvokom, slike z napisi in zvok s slikami). Kanonični korelacijski koeficient 0,665 je pokazal, da so 44,2 % variance pri učenju angleščine določili učenci s slušnimi učnimi preferencami in prilagodljivimi učnimi gradivi.

Keywords:
sensory-specific English learning material stimuli; sensory learning preferences; the canonical correlation analysis; adaptive learning material stimuli; auditory learning preference

Ključne besede:
Senzorično specifični dražljaji učne snovi angleščine, Kanonično-korelacijska analiza, prilagoditveni dražljaji učne snovi, preferenca slušnega učenja

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Introduction

Sensory learning preferences differ for each student (Aslaksen and Lorås, 2018; Rogowsky et al., 2015; Hayashi and Cherry, 2004; Reid, 1987), most often with different ways of perceiving, thinking, memorizing, and solving problems (Shepard-Carey, 2020; Golon, 2017; Keefe, 1987; Messick, 1976; Allport, 1973). Students are directly exposed to these stimuli in EFL materials, which are crucial for optimizing learning (Tomlinson 2008; Kozhevnikov 2007). Language learning is also an individualized, complex process. Different individuals perceive and respond to learning materials differently (Chen, 2019; Hsu, 2016; Lee, Yeung and Ip, 2016; Hedayati and Foomani, 2015). Hence, studying sensory preferences and sensory-specific stimuli could improve the learning of English.

Peacock (2001) and Luchow and Shepherd (1981) concluded that non-visual sensory modalities applied to visually related tasks do not enhance learning. Since the learning aim is to be completed visually, other sensory modalities might interfere with the meshing hypothesis.

Studies have also shown that if stimuli match learners' learning preferences, students can learn more effectively (Montero Perez, Peters, and Desmet, 2018; Keefe, 1991). The meshing hypothesis suggests adapting learning stimuli to learner preferences. Therefore, previous studies should be examined further. Research is needed to determine whether sensory-specific learning materials foster learners with different sensory preferences. To provide suitable language learning material stimulation, teachers must first understand their learners' learning preferences (Cohen, 2003).

Once teachers are aware of students' learning preferences, they can adapt their pedagogy and themselves to best suit the learning styles of their students (Gilbert, 2000). To cater to student learning differences, teachers should also consider individual learning differences when planning and designing their lessons, according to Fenrich (2006). Chen (2009), and Rezler and Rezmovic (1981) argued that Taiwan senior high schools ignore or omit these types of preliminary learning preferences among students. In light of this, the authors suggest that considering the relationship between sensory-specific language learning material stimuli, personal sensory learning preferences, and their impact on learning outcomes, language learners can improve students' English comprehension.

The correlation between personal preferences and stimuli used in learning materials remains unresolved. The learning process must be facilitated by both learning materials and pedagogical methods, as suggested by Rao (2011). Learning can be facilitated to enhance learners' comprehension. As a result of the findings, sensory-specific materials were emphasized as an important tool for bridging the learning gap between expectations and reality.

This study aimed to identify the relationship between sensory-specific learning materials and learner preferences in the learning of English. Using English language learning materials, the study investigated how sensory stimulation affects learning preferences.

Literature review

Humans' sensory perceptual learning modality

Since people are innately able to perceive things, we learn, get to know, and experience things primarily through our senses (Barth et al., 2012). In sensory perception, stimuli from the living world are recognized, organized, and interpreted in a variety of ways. Humans can perceive virtually every sense through their senses, Conscious awareness is present in some senses, while subconscious awareness is present in others, including visual, auditory, tactile, kinaesthetic, olfactory, taste, proprioception, and vestibular senses. It is through these that humans explore the world and discover its challenges and opportunities (Keefe, 1987).

To explain the concept that learners have differentiated learning preferences, Keffe (1979) classes each learner's learning style into three different categories and conceptualizes the individual styles into cognitive, affective, physiological, and physical perspectives. Cognitive learning focuses on how learners perceive the world. There appears to be a correlation between how learners perceive and process information and how they will process it. Affective perspectives emphasize how learners feel while they are learning, while physiological and physical perspectives emphasize how students respond to stimuli. Contrary to this, Cronbach and Snow (1977) proposed Aptitude-Treatment Interaction (ATI), indicating that when the educational materials are delivered to the student, teaching strategies can compensate for the learning results that are induced by individual differences (Thang, Nambiar, Wong, Jaafar, and Amir, 2015).

According to significant research, primates are capable of learning, especially through sensory integrations, since the Anterior Rhinal Cortex regulates multiple functions of this region (Goulet and Murray, 2001; Murray and Mishkin, 1985). DCT (Dual Coding Theory) of Paivio (1986) and Baddeley's (1998) working memory theory explain how humans incorporate, understand, process, store, extract, and use stimuli. In both theories, the mind of a human is defined clearly. Visual aids appear to play a significant role in learning, so they are used to integrate text and images into learning materials, ensuring student learning outcomes are promoted by how learning materials are presented and how they interact with student learning. Based on DCT theory, learning is not only about texts, but also how they are delivered to accommodate learners' individual needs and, above all, to induce positive outcomes.

Effects of sensory-specific learning material stimuli on learners with different sensory learning preferences

Learners perceive learning stimuli differently (Ehrman and Leaver, 2003; Oxford, 1993; Riding and Cheema, 1991; Felder and Silverman, 1988; Keefe, 1987; Messick, 1976; Allport, 1937). In the literature review, learning style, learning preference, or cognitive style were terms used by many researchers (Hederich-Martínez and Camargo-Uribe, 2016; Ehrman and Leaver, 2003; Littlemore, 2001; Merriam and Caffarella; 1999; Riding and Agrell, 1997; Tinajero and Páramo, 1997; Kinsella, 1996; Reid, 1984; Oxford, 1993; Jamieson, 1992; Riding and Cheema, 1991; Oxford, 1990). Learning styles have not been sufficiently verified. Throughout this article, the term "learning preference" is used in reference to Reid (1984).

Cronbach and Snow (1977) proposed Aptitude-Treatment Interaction (ATI) theory, claiming that when learning aptitude and teaching instruction are matched, optimal learning results will be generated (Pashler et al., 2008). Hence, learning stimuli should match learners' preferred learning styles. Such a match between learning stimuli and learning styles might increase students' chances of learning (Ferrero et al., 2016; Gleichgerrcht et al., 2015; Dandy and Bendersky, 2014; Howard-Jones, 2014; Dekker et al., 2012; Tabatabaei and Mashayekhi, 2012; Gilakjani, 2012; Riener and Willingham, 2010; Mulalic, Shah and Ahmad, 2009; Wintergerst, DeCapua and Verna, 2003).

The meshing hypothesis theory has been supported without any concrete evidence by several studies (Chew, 2016; Willingham et al., 2015; Pashler et al., 2008; Kozhevnikov, 2007; Coffield et al., 2004; Calvert et al., 2000). Bicer (2014) also found no statistically significant correlation between learning achievement and learning style preferences. Wright and Zhang (2009) also wrote a review regarding how public speaking training stimulates generalization of speech patterns. Considering that different training tasks have different effects on generalization, there is no simple way to predict a given task's generalisation pattern since there is no simple rule that can be used. Based on what has been discussed above, different sensory stimuli should be considered for individuals with various learning styles.

Since there are many types of learning styles, it is impossible to consider every single one, and it is highly unlikely that learning preferences will be remembered for each individual. It is undeniable that understanding learners' learning styles enhances classroom experience (Hames and Baker, 2015), but it is impossible to solve all the problems associated with learning foreign languages.

Studies conducted by Constantinidou and Baker (2002), Massa and Mayer (2007), Cook, Thompson, Thomas, and Thomas (2009) also claim that learning outcomes were not affected by differences in material stimuli. As with Massa and Mayer (2006), the Verbalizer-Visualizer Questionnaire (VVQ) experiment in this study confirmed the findings that there was insufficient evidence of significant differences between learners' learning abilities, regardless of learning style. According to the researchers, the findings of the study did not support the meshing hypothesis that better learning outcomes can be achieved through providing learning materials that correspond to students' learning preferences. However, the results contradict the meshing hypothesis; thus, the performance of the participants needs to be discussed further. A study by Fahim and Samadian (2011) concludes that experienced learners are much more flexible when it comes to sensory perception, while inexperienced learners tend to be the opposite. There has been insufficient discussion about sensory preference, so more empirical studies are required to clarify its effects

Purpose of the study

A canonical correlation analysis was used to investigate to what extent sensory English learning materials might influence the performance of EFL learners. Learners' learning preferences and sensory stimuli in learning materials have not been conclusively linked.

To gain a better understanding of how learning preferences affect English learning materials, this empirical study investigated the relationship between visual input (paper texts; images with captions), visual and auditory input (paper texts with sound; images with captions and sound; sound with images) and auditory input (sound), with the following research questions:

(1) What is the canonical correlation between learning preferences and sensory-specific English learning material stimuli?

(2) Is the meshing hypothesis supported or rejected by the findings?

Research methodology

Experimental design and procedure

It was a quasi-experimental design. Figure 1, Research Procedure, shows that the experiment lasted six weeks. Each week, different English learning material stimuli were provided to participants. Paper texts (visual stimuli) were used in the first week. The second week included paper texts with sound (a combination of visual and auditory stimuli). Week 3 used images with captions (visual stimuli), while week 4 used images with captions and sound (visual and auditory stimuli). The study involved the administration of sounds (auditory stimuli) and sounds with images (visual and auditory stimuli) during weeks 5 and 6. Following individual sensory-specific stimuli, each participant took about 20-30 minutes to assess their understanding of the English learning material. The students had to answer multiple-choice questions about sensory-specific stimuli as part of each English comprehension test.

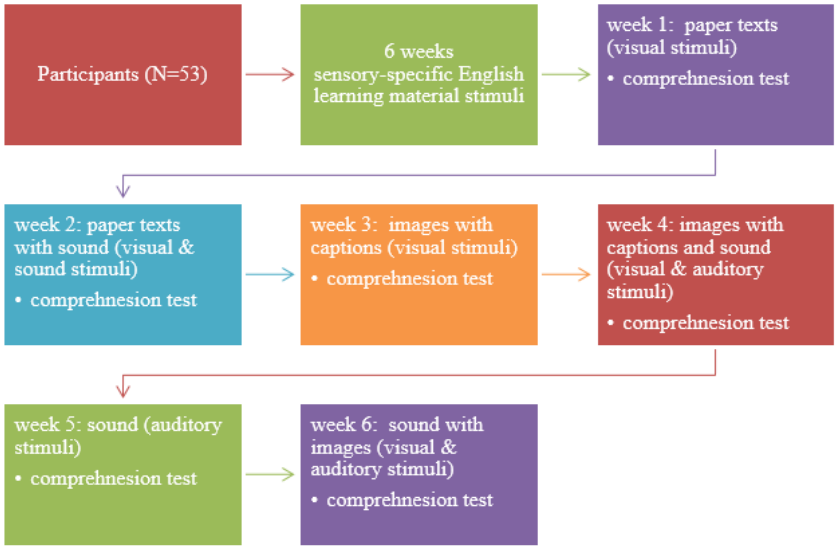

Figure 1. Research procedure

Participants

There were 53 participants in this study, 36 females and 17 males, who were vocational high school English majors in Northern Taiwan, aged 16-17. Six sensory-specific learning exercises guided them to engage and then answer multiple-choice questions related to the stimuli. Participants completed a self-report questionnaire to determine their learning preferences. They were not informed of their learning preferences before the experiment, and neither were the researchers.

The 53 participants in the quasi-experiment were classified as having four learning preferences: 8 visual learners, 27 auditory learners, 15 haptic learners and 3 kinaesthetic learners. It is also possible for someone's learning preferences to change over time (Reid, 1987). Student learning preferences were assessed using a self-report questionnaire. It is, however, important to note that the learning preference of an individual is relative rather than absolute. Therefore, canonical correlation analysis was used. Based on the canonical coefficients, auditory learners and adaptive learning material stimuli demonstrated a significant relationship in learning preferences. Therefore, the present study provided an in-depth description of auditory learners. The rest did not show a significant relationship after the intervention.

Analytical methods

A canonical correlation analysis was used to assess the relationship between sensory-specific English learning materials and learners' learning preferences. To better understand their relationship, the absolute values of the canonical loadings of the ranked variables were also calculated.

Data collection - Sensory-specific English learning material stimuli design

Sensory-specific English learning material was selected based on three criteria. First, learners need to identify the kinds of English learning material they are interested in, as well as select words appropriate to their word proficiency level. To avoid potential cognitive overload, participants should not be provided with material that is too long or difficult. Thirdly, it was essential that the materials be presented visually (paper texts; images with captions), visually and auditorily (paper texts with sound; images with captions and sound; sound with images) and auditorily (sound). We chose a series of American clips online. During a Taiwanese family's two years in the US, these American clips discuss culture shock. Because the main characters are also Taiwanese, this creates a connection with the learners, allowing for a discussion of cultural differences. Based on these criteria, the authors selected sensory-specific learning material stimuli.

English comprehension assessment

The English learning comprehension questions were administered following each sensory-specific stimulus activity to assess a participant's understanding related to the stimuli. A total of eight multiple-choice comprehension questions were used in each experiment regarding the sense-specific English learning material (see Appendix A for samples of multiple-choice comprehension questions in the experiment).

7. The father mentioned, "I have grown to love it like the daughter we wished Evan had been." What did he mean?
(A) Evan had a sister.
(B) Evan was his daughter.
(C) Evan had a daughter.
(D) Evan had been expected to be a daughter but it was on the contrary.

8. What did the mother's brother do?
(A) He does nothing.
(B) He sells furniture.
(C) He owns a restaurant.
(D) He is still a student.

Example 1: Samples of multiple choice comprehension questions in the experiment

One point was awarded for each multiple-choice comprehension question, so there would be an overall score of eight points for each stimulus test. The authors developed eight English comprehension tests for each learning series. Additionally, the test items were verified by experienced English teachers and professors with expertise in education and over ten years of teaching experience. For each item to bear the same level of difficulty during the English comprehension assessments, the difficulty index of each item was calculated statistically prior to the experiment to achieve consistent item discrimination. It was decided to omit those test items that were inappropriate for the test. In general, the difficulty index (DIF I) is 0.67 while the discrimination index (DI) is 0.46.

To make the statistical analysis comparable, the scores were added, counted, and normalised so that they could be compared. Taking the example of a participant who received four points on one sensory-specific learning activity and five in another, the participant would get 56.25 normalised scores as a result of both learning activities. A canonical correlation analysis was then performed on the scores to determine the correlation between the two (sensory-specific learning material stimuli and learning preference).

Self-report learning preference questionnaire

Adapted self-report questionnaires were administered after treatment to answer the second research question. To assess participants' learning preferences, a Likert Scale questionnaire (strongly agree = 5 points, agree = 4 points, undecided = 3 points, disagree = 2 points and strongly disagree = 1 point) and a True-or-False questionnaire were provided. A learning preference question that scored high was classified as indicating a preference for that type of learning.

There exist cultural differences among different countries (Joy and Kolb, 2009). Reid (1984) was used as a reference for the development of the self-report learning preference questionnaire according to cultural differences. For example, Asian students tend to be introverted, making it difficult to learn more about them. To facilitate their expression, the questionnaire was translated into their native language. A final step involved summarizing results from research questions one and two in order to support or reject the meshing hypothesis.

The scores on the adapted learning preference questionnaire were also normalised to determine the specific sensory preferences of learners. Learning preferences change over time, since they are not fixed (Reid, 1987).

Learning preferences, however, are not necessarily absolute since each individual does not belong to the same category of learning preferences.

Experimental results

(1) What is the canonical correlation between learning preferences and sensory-specific English learning material stimuli?

Table 1 shows that the canonical factor accounting for learning preferences ($\chi 1$) explained 44.2% of the total variance ($\eta 1$), the canonical factor explaining sensory-specific English learning material stimuli ($\varrho 2$=.442), and $\eta 1$ explaining 8.469% of the variance in sensory-specific English learning material stimuli.

There was a 44.2% overlap between learning preferences and sensory-specific English learning material stimuli: i.e., assessing the canonical factors ($\chi 1$ and $\eta 1$) alongside the four learning preferences subscales revealed that the four subscales of learning preferences accounted for 8.469% of the total variance in the six domains of sensory-specific English learning material stimuli.

It appears that the pair of canonical coefficients demonstrate an important relationship between auditory learners ($\chi 1$=.947) and adaptive learning material stimuli in the learning preferences: that is, paper texts with sound ($\eta 1$=.468), images with captions ($\eta 1$=.568), and sound with images ($\eta 1$=.496). These factors suggest that a significant relationship exists between these stimuli. Adaptive English learning material stimuli result in positive structural coefficients, which indicate students with auditory preference had better learning outcomes. For the rest, no significant relationship was observed after the intervention: visual learners ($\chi 1$=-.529), haptic learners ($\chi 1$=-.114) and kinaesthetic learners ($\chi 1$=-.482).

Table 1. Canonical correlation of learning styles and adaptive learning materials

X variables	**Canonical variables** χ_1	**Y variables**	**Canonical variables** η_1
visual learners	-0.529	paper texts	0.071
auditory learners	0.947	paper texts with sound	0.468
haptic learners	-0.114	images with captions	0.568
kinesthetic learners	-0.482	images with captions and sound	-0.512
		sound	-0.447
		sound with images	0.496
percent variance dependent	21.944	percent variance dependent	8.469
		ϱ^2	0.442
		Canonical correlation	0.665*

*p<.05

(2) Is the meshing hypothesis supported or rejected by the findings?

Figure 2 gives the ranked variables from the canonical solution as well as the absolute value of their canonical loadings in the canonical solution. According to statistical analysis of the results, auditory learners did not outperform when exposed to corresponding auditory sound stimuli. Contrary to what was expected, they did a better job when using visual aids. Thus, the present study has rejected the meshing hypothesis by demonstrating that an individual's preferred learning preference does not necessarily help predict their performance under the influence of their preferred sensory-specific stimuli. Rather than disadvantaging students who have different preferences when it comes to learning English, there is a need for them to have a choice of multiple materials that can help them meet their learning needs.

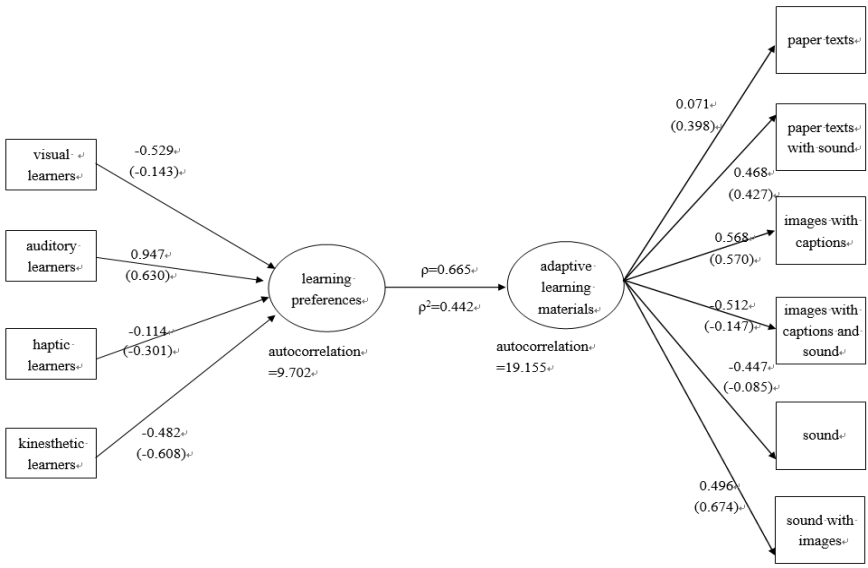

Figure 2. The ranked variables in the canonical solution and absolute value of their canonical loadings

Discussion

In this study, learners with specific learning preferences did not necessarily perform better with sensory learning materials (Krätzig and Arbuthnott, 2006). In the present study, auditory learners had greater success with visual aids.

According to the findings of the current study, the answer to the first research question was that sound ($\eta 1$=-.447) did not promote learning outcomes for auditory learners based on these outcomes. Instead, auditory learners benefit from scaffolding materials presented visually. This may be a result of auditory learners paying more attention to sensory-specific English learning material stimuli with which they are less familiar. This study also found that images with captions and sound had a negative canonical correlation with auditory learners. A high cognitive load might impede auditory learners' ability to learn effectively. There were also minor explanations for auditory preference learners in paper texts ($\eta 1$=.071). Sensory preferences still play a significant role in the development of an individual learner. Lastly, sensory-specific English learning material stimuli were negatively correlated with canonical correlations. Based on these findings, it can be deduced that auditory learners may be most influenced by sensory-specific stimuli associated with English learning materials. Regarding the answer to the second research question, the results showed that this was quite the opposite of what was predicted by the meshing hypothesis: learners do not necessarily perform better when they are under the influence of the corresponding learning material stimuli.

Conclusions and future work

According to previous research, it is commonly believed that learning preference determines learning performance. The meshing hypothesis holds that successful learning would occur under sensory-specific stimuli (Dobson, 2009; Reid, 1995; Gilley and French, 1976). However the results of various studies indicate that learners' performance differs between stimuli when exposed to different sensory modalities (Mahdjoubi and Akplotsyi, 2012). Moreover, learning preferences are also subject to change over time (Reid, 1987). Learners' preferences for learning affect their autonomy as individuals (Khojastenejad and Pishkar, 2015). Consequently, learning preferences remain an issue in language learning settings. Additionally, learning a foreign language may be affected by multiple variables, such as the impact of digital technology stimuli on cognitive load (Martin, 2012), and the relationship between learning preference and retention (Armstrong et al., 2021).

The present study aimed to identify how sensory-specific English learning material stimuli affected learners' performance and to test the hypothesis that meshing motivates learners to improve their performance. Identifying the strengths and weaknesses of a wide range of individual learners is essential for language instructors to recognize and better understand learners (Ortega et al., 2018; Tuan, 2011). Being flexible in pedagogy does assist learners in developing the ability to deal with different learning stimuli. However, learning preferences are not a panacea. As reminders and tools, they serve to clarify how learning outcomes are assessed (Armstrong, 2000). Additionally, since learners have different learning preferences, the way learning materials are presented matters greatly; therefore, it is crucial to consider the learning preferences of each learner during the design phase of teaching materials since students differ in the way they learn and think in different circumstances (Pashler et al., 2008; Sternberg et al., 2008). In this study, the results showed that auditory learners learned best under adaptive English learning material stimuli, likely because they were more prudent when using visual aids, with which they were not proficient, but which compensated for their poor proficiency. It is possible to predict which pedagogy will produce the best results when teachers understand their learners' learning preferences (Hames and Baker, 2015; Omrod, 2008; Pashler et al., 2008).It is strongly advised to be cautious when dealing with learners' individual learning preferences and to handle them with respect. It was considered inappropriate in the current study to label learners according to their learning preferences. To encourage greater retention, instructors should provide learners with a variety of learning material stimuli. Using sensory-specific English learning material stimuli does not necessarily lead to greater proficiency in language skills among learners with corresponding learning preferences, according to the present study. When teaching learners with different learning preferences, it is recommended to be open minded. To accommodate learners with very different learning characteristics, teachers should provide a variety of stimulus designs instead of emphasizing an individual's preferences. Therefore, English learning material design could support learners in learning English if viewed from multiple perspectives.Only 53 participants were recruited because of constraints on time, space, and manpower. Given the small number of participants, it was not possible to generalize the findings. The gender difference must also be examined to see if any significant differences exist.

To obtain further empirical conclusions, a larger sample size and a variety of nationalities should be included. It is recommended that the experiment be extended to further analyse how different types of sensory stimuli affect different types of learners with distinct learning preferences.

Furthermore, Taiwanese classes generally consist of a mix of students with varying levels of proficiency. In fact, structured pedagogy does have a great impact on students with low proficiency. However, highly proficient individuals may experience quite the opposite (Freebody and Tirre, 1985). In the future, researchers could also consider the learners' various proficiency levels. When designing a study, it is also important to consider a learner with a different cultural background who has specific characteristics. The findings of this study are in line with those of a previous study that did not endorse the meshing hypothesis (Rogowsky et al., 2015).

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REVIJA ZA ELEMENTARNO IZOBRAŽEVANJE
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UPORABA SODOBNIH UČNIH PRISTOPOV PRI UČENJU OSNOV DIDAKTIKE MATEMATIKU V SPLETNEM UČNEM OKOLJU MAHARA

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Abstract/Izvleček V prispevku predstavljamo posodobitev izvedbe predmeta Osnove didaktike matematike. Cilji posodobitve so bili, da z uporabo IKT sredstev in sodobnih učnih pristopov presežemo objektivne omejitve pri izvajanju nekaterih elementov učnega procesa. V ta namen smo za predmet izdelali e-listovnike v okolju Mahara. Študenti so po zaključku izvedbe predmeta izpolnili anketni vprašalnik. Ugotovili smo, da smo s posodobitvijo izvedbe predmeta izboljšali komunikacijo med udeleženci in kvaliteto analiz, povečali vključenost študentov v učni proces ter bolj ozavestili študente o pojavih pri poučevanju. Nismo pa izboljšali ravni refleksije do te stopnje, da bi študenti presegli začetne subjektivne teorije o poučevanju.

Ključne besede:
e-listovnik Mahara, kombinirano učenje, obrnjeno učenje, sodelovalno učenje, subjektivne teorije bodočih učiteljev matematike.

Using Modern Learning Approaches in Teaching Basic Didactics of Mathematics in the Mahara E-Portfolio Environment

This paper presents an updated version of the implementation of the course Basics of Didactics of Mathematics. The main goals of the modernization were to use ICT tools and modern learning to overcome objective limitations in the implementation of some elements of the teaching process. For this purpose, we created e-portfolios in the Mahara environment. After the course, students were asked to complete a survey questionnaire. It was found that the updated version of the subject led to improved communication between the participants, increased student engagement in the learning process, and increased student awareness of teaching phenomena. We were not successful in increasing the level of reflection to the point where students would move beyond their initial subjective theories of teaching.

Keywords:
e-portfolio Mahara, blended learning, flipped learning, cooperative learning, subjective theories of prospective teachers.

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Uvod

Izobraževalci učiteljev naj ne bi le modelirali uporabe tehnologije pri pouku, ampak naj bi z njo tudi uresničevali učne cilje, vsebinske standarde predmeta ter zadovoljevali potrebe študentov (Uerz idr., 2018). Pomembno vprašanje pri tem je, kako sodobno učno tehnologijo uporabiti kot integriran del učnega pristopa pri doseganju ciljev nekega predmeta (Abbitt, 2011). Pri predmetu Osnove didaktike matematike, katerega obiskujejo bodoči učitelji matematike, se osredotočamo na poučevanje treh vsebinskih sklopov: 1. elementi poučevanja matematike (npr. diferenciacija, delo z matematično nadarjenimi učenci), 2. teorija učenja matematike (vedenjski, kognitivni/konstruktivistični, interakcijski pristop pri pouku matematike), 3. reševanje matematičnih problemov. Temeljni cilj, ki ga v okviru predmeta želimo doseči pri študentih, je sprememba paradigme, torej zahteven premik od na transmisiji temelječih subjektivnih teorij učenja in poučevanja k sodobnejšemu in strokovno ustreznejšemu razumevanju pouka, kar seveda spremlja premik v razumevanju vloge učitelja v razredu. Subjektivne teorije učitelja predstavljajo učitelju nekakšno vodilo za pedagoška ravnanja v konkretnih situacijah. Oblikujejo se v posameznikovem miselnem sistemu kot integrirana celota pogledov, stališč, vrednot, idealov o nekem pojavu (Jug, 2008). Pajares (1992) pravi, da je subjektivne teorije lažje spreminjati v začetni fazi poučevanja, saj še niso povezane v neko stabilno strukturo. Pri študentih se tako v začetni fazi poučevanja osredotočamo na ozaveščanje in reflektiranje subjektivnih teorij o učenju otrok in njihovi aktivnosti ter subjektivnih teorij o vlogi učinkovitega učitelja pri poučevanju matematike. Dejavniki subjektivnih teorij namreč pogosto povzročajo nenačrtovane učinke vzgojno-izobraževalnega procesa (Jug, 2008). Korthagen (2004) je oblikoval model jedrne refleksije, katerega ideje lahko uporabimo tudi za ozaveščanje subjektivnih teorij pri študentih. Pri študentih je tako potrebno spodbujati refleksijo na konkretnih izkušnjah, učnih situacijah, pri čemer se osredotočamo na študentovo razmišljanje o subjektivni teoriji, vzpostavljanje kognitivnega konflikta, ki študenta privede do soočanja njegove predstave z znanstveno teorijo ter do preoblikovanja miselnih struktur. Pomembno vprašanje pri tem pa je, kako čim bolj kakovostno te cilje doseči. Devlin in Samarawickrema (2010) med pomembnimi smernicami zagotavljanja kakovostnega pouka poudarjata uporabo tistih učnih pristopov, ki omogočajo učencem aktivno sodelovanje, veliko medsebojne interakcije, razvijanje samoregulativnih spretnosti ter prevzemanja odgovornosti za lastno učenje.

V vseh primerih gre za učne pristope osredinjene na učence, saj le-ti zahtevajo njihovo aktivno vlogo v učnem procesu in s tem razvijanje višjih kognitivnih procesov. Med učnimi pristopi z uporabo IKT, ki podpirajo učenčevo aktivno vlogo, so med drugim najpogosteje uporabljeni sodelovalno, kombinirano in obrnjeno učenje (Kaushik, 2016). V teoretičnem delu prispevka bomo predstavili omenjene pristope in umestili njihovo uporabo v spletno sodelovalno učno okolje Mahara. V empiričnem delu pa bomo predstavili rezultate evalvacije posodobitve izvedbe predmeta Osnove didaktike matematike z uporabo novih smernic v izobraževanju.

Sodobni učni pristopi v visokem šolstvu

Z razvojem IKT in njeno vključitvijo v učni proces, še posebej pa z izobraževanjem na daljavo, se je razvil nov učni pristop, to je kombinirano učenje, ki skuša kombinirati prednosti klasičnega in spletnega učenja (Garrison in Vaughan, 2008). Watson (2008) pravi, da se bo ta pristop v prihodnosti pokazal kot prevladujoči učni pristop. Z IKT lahko namreč zagotavljamo učencem bolj prožna in interaktivna učna okolja, ki so neodvisna od časa in prostora, hkrati pa ohranjamo tradicionalno učno okolje. Sivakumar idr.(2013) predstavljajo rezultate projekta, pri katerem so v nekatere študijske programe strojništva vključili kombinirano učenje z uporabo spletnega učnega okolja Moodle. Ugotovili so, da tako profesorji kot študenti med orodji kombiniranega učenja še posebej visoko ocenjujejo orodja, ki povečajo interakcijo in spodbujajo komunikacijo med študenti in profesorji (to so npr. spletna preverjanja znanja in spletne diskusije). Yurniwati in Yarmi (2020) sta izvedla raziskavo med bodočimi učitelji pri predmetu Poučevanje aritmetike. Kontrolna skupina študentov je bila deležna klasičnega pouka, eksperimentalna skupina pa kombiniranega učenja. Kombinirano učenje je potekalo v spletnem sodelovalnem okolju Edmodo. Študenti so v tem okolju prejemali učna gradiva, video posnetke razlage matematičnih posnetkov, katere so morali analizirati glede na relevantne didaktične elemente ter analizo v spletnem okolju tudi oddati. Pri učnih urah »v živo« so prav tako v skupinah diskutirali o možnih načinih obravnave oz. razlage izbranega matematičnega pojma. Študenti, ki so bili deležni klasičnega pouka (kontrolna skupina), pa so najprej poslušali razlago matematičnega pojma, potem pa so v skupinah diskutirali, kako bi ta matematični pojem predstavili učencem. Rezultati raziskave so pokazali, da so študenti, ki so bili deležni kombiniranega učenja, bolje razumeli matematične koncepte (računske operacije z ulomki) ter so poznali več različnih razlag izbranih matematičnih konceptov.

Pristop obrnjenega učenja je model kombiniranega učenja, katerega sta prva začela uporabljati srednješolska učitelja Bergmann in Sams (2012). Izhodiščna ideja obrnjenega učenja temelji na uporabi večpredstavnostnih predavanj, ki si jih učenci ogledajo izven učilnice, pred poukom, čas pouka v učilnici pa je namenjen uporabi znanja na različnih primerih, diskusiji, razčiščevanju morebitnih nejasnosti. V kasnejših različicah izvedbe tega pristopa je videoposnetke lahko zamenjal tudi kakšen drug izobraževalni objekt (npr. knjiga). Ključne prednosti uporabe obrnjena učenja so spodbujanje razvoja višjih pojmovanj znanja (Plešec Gasparič, Valenčič Zuljan in Kalin, 2020), povečanje interakcije med udeleženci učnega procesa, vključitev vseh učencev v učni proces in prevzemanje večje odgovornosti učencev za učenje (Bergmann,idr., 2013). Vsekakor gre za pristop, ki je še posebej primeren v visokošolskem izobraževanju, saj zahteva od učenca zrelost, samostojnost, hkrati pa omogoča razvijanje spretnosti, ki so nujno potrebne v 21. stoletju, to so kritično razmišljanje, ustvarjalnost, komunikacijske in sodelovalne spretnosti.

Sodelovalno učenje običajno vključuje manjšo skupino učencev, ki delajo z namenom doseganja skupnega učnega cilja, pri tem pa delo zastavimo tako, da med člani skupine zagotovimo pozitivno soodvisnost in posameznikovo odgovornost (Johnson in Johnson, 2014; Peklaj idr., 2001; Sun idr., 2018). Z razvojem IKT se nam odpirajo nove možnosti za računalniško podprto sodelovalno učenje (Ryberg idr., 2018). Učitelj mora pri tem ustvariti e-učno okolje, ki bo spodbujalo učence k medsebojni interakciji, v kateri bodo skupaj razmišljali, reševali probleme in reflektirali aktivnosti. Učenci morajo dobiti tudi ustrezne povratne informacije (Hsu in Ching, 2013), v katerih so zajeti vsebinski povzetki dela vseh skupin, izpostavljeno je bistvo in poskrbljeno je za povezavo novega znanja s predznanjem ter za prenos znanja v nove učne situacije (Plešec Gasparič idr., 2020). Dosedanje raziskave o uporabi IKT za sodelovalno učenje v visokem šolstvu (npr. Sun idr., 2018) so pokazale, da je e-sodelovalno učenje izboljšalo komunikacijo med študenti, študenti so bolj sodelovali in bili bolj vključeni v študijski proces.

E-listovnik Mahara kot spletno sodelovalno učno okolje

Zadnjih nekaj desetletij je bil narejen tudi pomemben premik v paradigmi na področju preverjanja znanja od bolj tradicionalnih oblik do vključevanja alternativnih oblik preverjanja, ki temeljijo na formativnem spremljanju učenčevega znanja (Razdevšek Pučko, 1998).

Razvoj IKT je tudi na tem področju prinesel spremembe in pojavili so se elektronski listovniki (e-listovniki). E-listovniki v osnovi predstavljajo zbirko učenčevih izdelkov, refleksij ipd., s čimer učenec dokumentira in spremlja lasten proces učenja. Vključujejo lahko tako tekstovne, grafične kot multimedijske elemente (Lamont, 2007). Riedinger (2006) poudarja bistveno prednost e-listovnikov pred klasičnimi, to je večja fleksibilnost v zbiranju in dokumentiranju izdelkov. Z e-listovnikom lahko tudi ustvarimo prostor za nov učni kontekst, v katerem je poudarjena refleksija, komunikacija med udeleženci (Agerboek, 2007) in spremljanje lastnega napredka pri učenju (Riedinger, 2006). E-listovnik lahko tako postane spletno sodelovalno učno okolje. Römmer-Nossek in Zwiauer (2007) poudarjata, da imajo v visokem šolstvu e-listovniki pomembno funkcijo tudi za doseganje večje aktivnosti študentov pri konstruiranju lastnega znanja. Pri tem je pomembno, da e-listovnik vključuje učne aktivnosti, ki so usmerjene v doseganje učnih ciljev in spodbujajo pri učencih refleksijo. Proces refleksije pri bodočih učiteljih naj bi pri tem spodbujal razvoj metakognicije in bil usmerjen v kritično razmišljanje o ravnanjih učitelja v kontekstu poučevanja (Bairral in Santos, 2012). V povezavi s to funkcijo uporabe e-listovnika so Seman idr. (2012) v svoji akcijski raziskavi, v kateri so bodoči učitelji izdelovali učni e-listovnik, ugotovili, da je e-listovnik, ki so ga bodoči učitelji izdelali v spletnem učnem okolju Mahara, enostaven in učinkovit za uporabo ter podpira proces učenja in profesionalni razvoj bodočih učiteljev. Aplikacija Mahara je prostodostopna in je namenjena oblikovanju spletnega e-listovnika učenca in/ali učitelja. Lamont (2007) je raziskoval, kako študenti, bodoči učitelji, ocenjujejo uporabo e-listovnika Mahara. Študenti, vključeni v raziskavo, morajo skozi več semestrov študija izdelovati e-listovnik namenjen profesionalnemu razvoju bodočih učiteljev. Lamont (2007) je v raziskavi evalviral uporabo e-listovnika Mahara skozi en semester in ugotovil, da je večina študentov ocenila sodelovanje v skupinah ter povratno informacijo v Mahari kot učinkovito strategijo za reflektiranje lastnega procesa učenja.

Opredelitev problema

Vpeljava posodobitve izvedbe predmeta Osnove didaktike matematike je izhajala iz želje po čimbolj kakovostni uresničitvi temeljnih ciljev predmeta z uporabo sodobnih učnih pristopov, ki vključujejo uporabo IKT. Pri predavanjih smo dotlej tipično izhajali iz realističnih situacij, povezanih s poučevanjem matematike, pomemben element pri vajah pa so bile simulacije (mini nastopi) študentov, ki jim je sledila analiza.

Tako pri predavanjih kot pri vajah smo izvajali krajše diskusije, saj so te nujne za zavedanje lastnih stališč (subjektivnih teorij) in za njihovo spreminjanje. Pri analizi izhodiščnih situacij in diskusijah je kljub delu v skupinah na predavanjih in vajah običajno sodelovalo omejeno število študentov, omejeni pa smo bili tudi v času izvajanja diskusij, pri analizi simulacij je bila težava tudi minljivost, neponovljivost učnih situacij. Želeli smo, da bi z uporabo IKT lahko povečali vključenost vseh študentov v diskusije, razširili čas diskusije tudi izven tradicionalnega učnega okolja in izboljšali kvaliteto analiz, predvsem s spodbujanjem višjih kognitivnih procesov ter s tem pomagali študentom ozaveščati in spreminjati obstoječe subjektivne teorije o učenju in poučevanju.

Cilji in opis posodobitve izvedbe študijskega predmeta

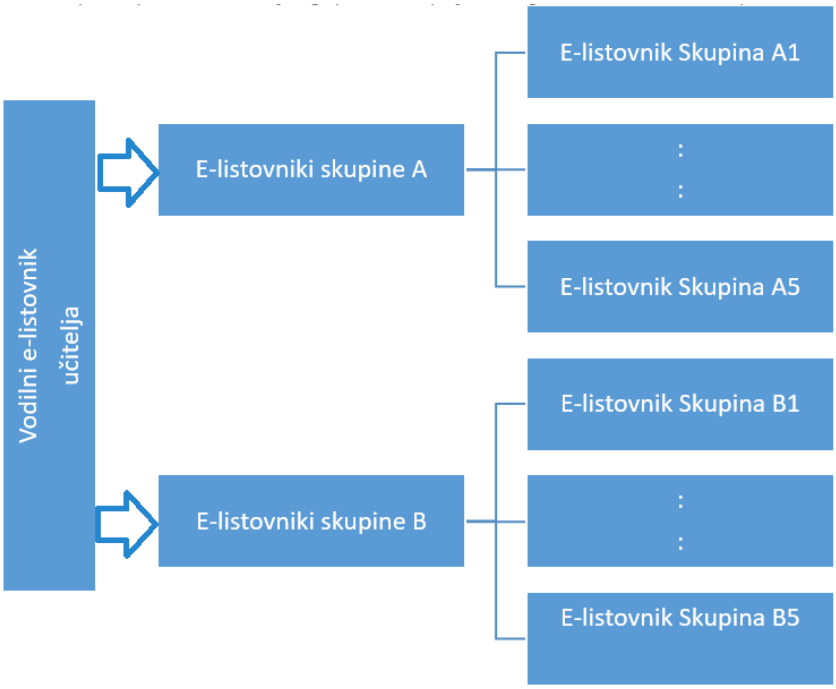
Raziskave kažejo, da izobraževalci učiteljev pogosteje uporabljajo tehnologije z namenom, da podprejo obstoječe načine poučevanja in z njihovo pomočjo ne spreminjajo obstoječe prakse poučevanja (Tondeur idr., 2016). Posodobitev izvedbe predmeta Osnove didaktike matematike smo zasnovali na osnovi vključitve sodobnih, prožnih učnih pristopov ob uporabi IKT.

Cilji posodobitve so bili, da bi z uporabo IKT sredstev in sodobnih učnih pristopov:

1. presegli objektivne omejitve pri izvajanju analiz in diskusij (pomanjkanje časa, 'neponovljivost' simulacij);
2. izboljšali komunikacijo med vsemi udeleženci učnega procesa (v smislu širše in intenzivnejše vključenosti vseh udeležencev);
3. izboljšali raven refleksije študentov (razvoj višjih miselnih procesov) in ozavestili študente o lastnih subjektivnih teorijah.

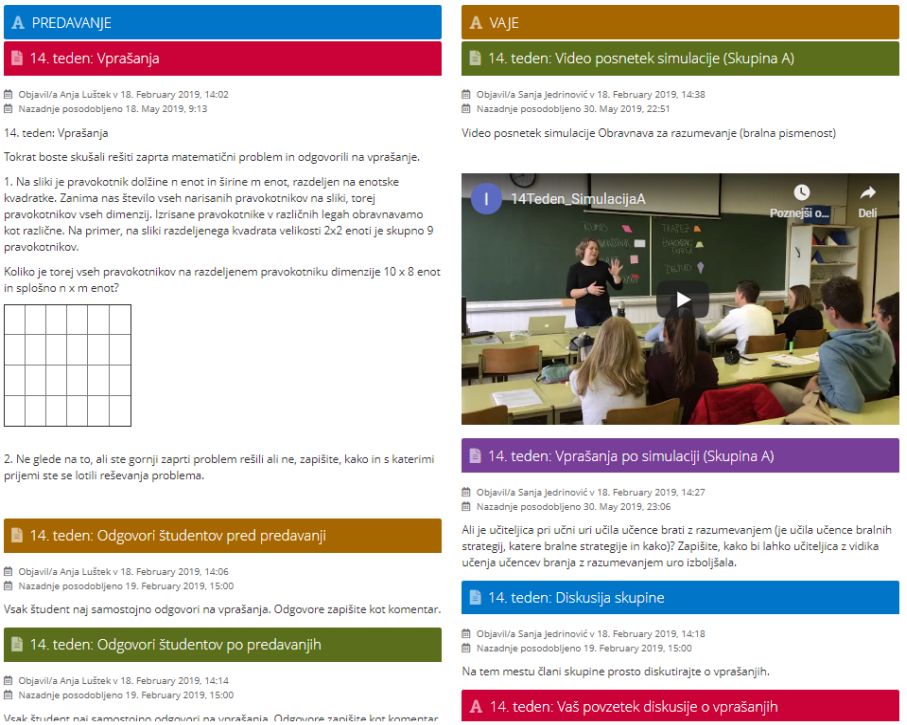
Da bi realizirali cilje posodobitve, smo uporabili inovativnejše učne pristope in oblike dela z uporabo IKT. Spremembe pri izvedbi predmeta so bile narejene pri predavanjih in vajah. Uporabili smo kombiniran učni pristop s poudarkom na računalniško podprtem sodelovalnem učenju. Učenje izven učilnice je potekalo preko e-listovnika Mahara, v katerem smo oblikovali spletno sodelovalno učno okolje. Pri predavanjih smo vključili tudi nekaj elementov obrnjenega učenja, saj so študenti v sodelovalnem okolju prejeli vnaprej gradivo (videoposnetke, e-vire), nerazdelane učne situacije in vprašanja, na katera so samostojno odgovarjali že pred predavanji.

Pred izvedbo predmeta smo izdelali kompleks povezanih e-listovnikov v okolju Mahara (Slika 1). Študenti obiskujejo vaje pri predmetu v dveh ločenih skupinah, zato smo jih tudi v e-listovniku razdelili v skupino A in skupino B. Znotraj vsake od teh skupin so se študenti razdelili v stalne sodelovalne skupine treh študentov (oz. en par). Vsaka skupina je sodelovala znotraj svojega e-listovnika, učitelja (predavatelj in asistentka) pa sta upravljala vodilni e-listovnik, preko katerega sta lahko komunicirala z vsemi skupinami.



Slika 1. Struktura povezav v e-listovniku Mahara

Posamezen e-listovnik skupine študentov je vseboval uvodno stran in po eno stran za vsak teden pouka. Na uvodni strani so bila objavljena obvestila, načrt dela pri predmetu in razna gradiva. Tedenska stran je bila razdeljena v dva ločena stolpca za predavanja in vaje (Slika 2).



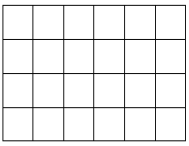
Slika 2. Primer dela tedenske strani v e-listovniku Mahara

Ko smo imeli izdelano e-učno okolje, smo razdelali izhodiščne situacije (Slika 3, Slika 4), uporabljene pri predavanjih in jih pred predavanjem objavili na vseh e-listovnikih, skupaj z vprašanji. Študentje so morali na vprašanja odgovarjati v e-listovniku individualno pred in po predavanjih. Z nekaterimi vprašanji smo želeli pri študentih tudi razkriti obstoječe subjektivne teorije o poučevanju. Kot primer navajamo vprašanje c) na Sliki 4. Iz odgovorov študentov na to vprašanje je razvidna tipična predstava študentov, da je razlaga edini način pridobivanja matematičnega znanja pri učencih. Predavatelj je pred predavanjem prebral odgovore študentov in jih ustrezno vključil v predavanje. Pri nekaterih vprašanjih, kjer je bilo smiselno, je predavatelj pripravil v e-listovniku povzetek odgovorov (Slika 5).

14. teden: vprašanja

Tokrat boste skušali rešiti zaprt matematični problem in odgovoril na vprašanje.

1. Na sliki je pravokotnik dolžine n enot in širine m enot, razdeljen na enotske kvadratke. Zanima nas število vseh narisanih pravokotnikov na sliki, torej pravokotnikov vseh dimenzij. Izrisane pravokotnike v različnih legah obravnavamo kot različne. Na primer, na sliki razdeljenega kvadrata velikosti 2 x 2 enoti je skupno 9 pravokotnikov.
   Koliko je torej vseh pravokotnikov na razdeljenem pravokotniku dimenzije 10 x 8 enot in splošno n x m enot?



2. Ne glede na to, ali ste zgornji zaprti problem rešili ali ne, zapišite, kako in s katerimi prijemi ste se lotili reševanja problema.

Slika 3. Primer vprašanj pred predavanji v e-listovniku, ki zahteva raziskovanje

8. teden: vprašanja

Koliko je 15/0?

Odgovor na gornje vprašanje seveda poznate. Prava vprašanja za vas pa so:

a) Zakaj celo veliko srednješolcev meni, da je 15/0 =15?
b) Kako bi osnovnošolca prepričali, da ni mogoče deliti z 0?
c) Kako bi osnovnošolca naučili, da ni mogoče deliti z 0?

Po predavanju ponovno odgovorite le na c) vprašanje. Kako bi torej ravnali, da bi učence naučili, da ni mogoče deliti z 0?

Slika 4. Primer učne situacije, kjer vprašanje c) razkriva subjektivne teorije študentov o poučevanju matematike

Koliko je $\frac{15}{0}$?

Ponudili ste naslednje razlage (mnogi med vami celo po več razlag) dejstva, da mnogi osnovnošolci in tudi srednješolci povedo, da je 15:0 enako 15 ali tudi 0.

1. Število 0 »ne spreminja števil« (npr. 15+0 = 15), zato je $\frac{15}{0} = 15$.
2. Število 0 je - podobno kot število 1 - enota. Operacija z enoto pa ohranja število.
3. Rezultat pri operaciji deljenja dveh števil (in drugih operacijah) mora biti neko število. Edino 0 in 15 sta možna razumna rezultata.
4. Pri deljenju razdelimo celoto na enake dele. Če delimo z 0, potem sploh ne delimo, tako da celota ostane taka, kot je. Torej je $\frac{15}{0} = 15$.
5. Učenci/dijaki zamešajo $\frac{15}{0}$ in $\frac{15}{1}$. Enostavno si narobe prikličejo enostavne račune deljenja.
6. Ni videti, koliko je $\frac{15}{0}$, ampak če neko število npr. delimo s 100, dobimo približno toliko. kot če delimo s 101. Blizu naravnega števila 0 je 1, zato mora biti $\frac{15}{0}$ nekje blizu $\frac{15}{1}$, torej 15.
7. Učenci/dijaki pomešajo račun $15 \cdot 0 = 0$ in $\frac{15}{0} = 0$.
8. V računih število 0 ignoriramo, saj 0 pomeni, da ni ničesar, npr. 15 + 0 = 15 (+prazen prostor) = 15, podobno je $\frac{15}{0} = \frac{15}{\square}$.

Slika 5. Primer povzetka odgovorov študentov na vprašanje pred predavanji

Na vajah smo izvedli simulacije študentov, katere smo tudi posneli. Po izvedbi simulacije smo izpostavili nekaj pomembnih didaktičnih vidikov o ogledani simulaciji, vendar diskusije nismo izvedli. Posnetke smo objavili na e-listovniku, tako da so si jih študentje lahko večkrat ogledali. Ob posnetkih so študenti prejeli še zapisana vprašanja o pomembnih vidikih učnega procesa, ki naj bi jih pri simulaciji analizirali in o njih razmislili (Slika 6). V e-listovniku so nato člani skupine predstavili svoja stališča o pojavih, jih analizirali in teoretično utemeljili. Diskusija med člani skupine je v obliki foruma lahko potekala kar na strani e-listovnika (Slika 7), ni pa bil ta način komuniciranja obvezujoč. Do naslednjih vaj so morali člani skupine izdelati in v e-listovnik zapisati skupen sklep odgovorov (Slika 8). Po oddaji smo odgovore natančno pregledali in študentom na strani e-listovnika podali povratno informacijo (Slika 9).

Simulacija *Novi učitelj matematike*

1. Na kaj mora biti učiteljica pri govoru v razredu pozorna? Analizirajte učiteljičino verbalno izražanje pri učni uri.
2. Kakšna bo vaša nova učiteljica (stroga/mila)? Kako ste to ugotovili?

Slika 6. Primer vprašanj za analizo simulacije v e-listovniku

Kakšna bo vaša nova učiteljica (stroga/mila)? Kako ste to ugotovili?

Študent 2: Mislim, da če se postavimo v vlogo devetošolcev, da bo pri tej učiteljici dovoljeno dosti stvari. Ne bi je jemali resno, da je »grozila« z nasmehom. Nepotrebno je razlagala vsako stvar in tako zašla s snovi (npr. ali res ne rabimo znati slovnice pri vas?). Skratka menim, da bi jo učenci preizkušali in nekako ne bi verjeli njenim kaznim.

Študent 1: Mislim, da bo nova učiteljica stroga, vsaj kar se tiče obveznosti pri predmetu - testi, ustna preverjanja in domače naloge (ocenjevanje domačih nalog). Glede na to, da je že sredina šolskega leta so štiri pisna in tri ustna preverjanja preveč. Kar se pa tiče delanja miru v razredu in ukrepanja, mislim, da bi se jo dalo nekako »prinesti okoli«-to učenci v osnovnih šolah znajo zelo dobro.

Študent 3: Ni bila pozorna na vse učence enako, ker ni opazila, da eden od učencev (v prvi vrsti) ni spremljal učne ure, vendar je ves čas gledal skozi okno.

Študent 2: Se strinjam, ni bila pozorna na dogajanje v razredu. Ko je opazila sporno dogajanje, je strogo reagirala. Strinjam se, da ni bila odločna.

Študent 3: Kot sem oz. smo že prej omenile, smo glede na to, kako je bila pozorna na celoten razred ugotovile, da bo naša učiteljica mila in se je učenci ne bomo »bali« ter si bomo dovolili vse. Se pa strinjam tudi s *Študent 1*, da bo glede ocenjevanja preveč stroga, ker v osnovni šoli mislim, da učitelji ne potrebujejo treh ustnih ocen.

Slika 7. Primer dela diskusije med študenti o opazovani simulaciji v e-listovniku

Naša nova učiteljica bo mila, ker je zelo popustljiva, prijazna. Snovi nas bo verjetno veliko naučila, pomagala ob težavah in odgovarjala na naša vprašanja, nam pustila svobodno razmišljanje in nam pomagala s primeri ali s popravljanjem, da si bomo lažje zapomnili snov. Težavno vedenje nekaterih je tudi ignorirala, kar nam pove, da bomo lahko sodelovali ali pa se zabavali ali gledali skozi okno, odvisno je od odločitve posameznega učenca. Dala je tudi na izbiro, da si učenci sami izberemo, kako bomo opravljali ustno spraševanje. To vse smo ugotovile iz njenega izražanja in obnašanja. Bila je vedno nasmejana, tudi ko smo nagajali in ni se razjezila na učenca, ki je bral svojo knjigo, ali tistega, ki je celo uro gledal skozi okno.

Slika 8. Primer zapisa dela sklepa skupine na diskusijo o vprašanjih iz simulacije v e-listovniku

Večinoma ste zelo dobro opozorili na vse pomembne elemente verbalnega izražanja: jakost glasu, tempo govora, uporabo knjižnega pogovornega jezika. Zelo pomembna je tudi usklajenost verbalne in neverbalne komunikacije. Učenci so zelo občutljivi na učiteljevo neverbalno izražanje, zato mora le-to biti dovolj izrazito ter usklajeno z verbalnim izražanjem. Kakšni boste kot novi učitelj boste učencem v veliki meri sporočili neverbalno (pomemben je tudi očesni kontakt z učenci), zelo pomembno je tudi, kako reagirate na motnje v razredu. Marsikatero motnjo lahko odpravimo brez prekinitve pouka, preprosto z očmi ali tako, da se približamo učencu. Podajam nekaj vaših komentarjev, v katerih ste zelo dobro opisali opažanja:.....(*sledijo primeri odgovorov študentov).*

Slika 9. Primer dela zapisa povratne informacije študentom na zapisane sklepe skupin v e-listovniku

Metodologija

Metode

V raziskavi smo uporabili kvantitativni in kvalitativni pristop pedagoškega raziskovanja z deskriptivno in kavzalno-neeksperimentalno metodo. Opravili smo osnovne statistične izračune opisne statistike (frekvence, odstotki), za katere smo pridobili podatke z anketnim vprašalnikom ter izvedli analizo dokumentov (e-listovniki). Avtorica prispevka je sodelovala kot asistentka pri izvedbi predmeta.

Vzorec

V raziskavo je bilo vključenih 29 študentov, ki so obiskovali predmet Osnove didaktike matematike programa dvopredmetni učitelj, smer matematika.

Zbiranje in obdelava podatkov

V okviru posodobitve izvedbe predmeta smo za študente izdelali anketni vprašalnik, s katerim smo želeli izvedeti, kako so študenti uporabljali e-listovnik v sodelovalni skupini in kako učinkovita se jim je zdela uporaba e-listovnika in kombiniran pristop poučevanja v spletnem sodelovalnem okolju.

Vprašalnik je bil sestavljen iz 13 vprašanj, od tega 2 vprašanji z Likertovo 4-stopenjsko lestvico stališč (1 - sploh se ne strinjam, 4 - zelo se strinjam). E-listovnike študentov smo vsebinsko analizirali, tako da smo pregledali individualne odgovore študentov pred in po predavanjih ter sklepne odgovore skupin na vprašanja iz videoposnetka simulacije pri vajah.
Na vprašalnik je odgovorilo 27 od 29 študentov. E-listovnik je v celoti izpolnilo vseh 10 skupin študentov.

Rezultati z razpravo

Posodobitev izvedbe predmeta Osnove didaktike matematike je temeljila na vpeljavi sodobnih učnih pristopov z vključitvijo IKT v sam predmet. Z analizo e-listovnikov in odgovori na anketni vprašalnik smo želeli ugotoviti, v kolikšni meri smo uresničili zadane cilje posodobitve.
Ovire pri učinkoviti implementaciji poučevanja z rabo IKT lahko nastopijo že na tehnični ravni. Velika večina študentov (70,4 %) je izjavila, da pri delu z e-listovnikom ni imela nikakršnih težav. Vsi ostali (29,6 %) pa so navedli kvečjemu manjše težave (npr. težave pri kopiranju vsebine na e-listovniku, nedelujoči šumniki v forumu). Nasploh so bili študenti zadovoljni tudi s kvaliteto objavljenih posnetkov (M = 3,22), snemanje simulacije jih ni motilo (M = 3,25).

Uporaba e-listovnika pri izvedbi predavanj

Študentje so vsak teden na e-listovnik prejeli učno gradivo ter opis didaktične situacije in s tem povezano vprašanje, na katerega so morali odgovoriti pred predavanjem in večkrat tudi po predavanju. Za odgovarjanje na vprašanja, povezana s predavanji, so študentje ocenili, da so tedensko porabili med 10 in 90 minut, v povprečju 38,2 minute. Z analizo odgovorov študentov smo ugotovili, da so vsi študentje, skoraj brez izjem, redno odgovarjali na vprašanja, mnogi so podajali zelo izčrpne odgovore. Na sliki je prikazan primer odgovora študentke na vprašanje pred in po predavanjih (Slika 10). Iz primera odgovora študentke (Slika 10) po predavanjih je razvidno, da so nekateri študenti vključili v svoj odgovor vsebino obravnavano na predavanjih (konstruktivistični učni pristop) in do določene mere preoblikovali svojo začetno predstavo o poučevanju matematike, to je pri konkretnem primereu, da se učenci učijo matematike le preko poslušanja razlage učitelja.

Večinoma pa nam ni uspelo, da bi študenti slišano na predavanjih, znali uporabiti pri didaktični analizi realne situacije pri poučevanju. Iz analize odgovorov študentov pred predavanji smo tako veliko izvedeli o subjektivnih teorijah študentov o poučevanju matematike, kar smo lahko uporabili pri načrtovanju in izvedbi predavanj. Med subjektivnimi teorijami študentov bi izpostavila še dve, ki sta se pogosto pojavljali, to je, da znati matematiko pomeni, da znaš postopke in da učence učimo in pri njih preverjamo le poznavanje in izvajanje postopkov, ter predstava, da če učencu učitelj nekaj razloži, potem učenec to razume in si učiteljeve razlage ne more interpretirati drugače.

Pred predavanji

Mislim, da veliko srednješolcev meni, da je 15/0 = 15 zaradi nepoznavanja o številu - o številu 0 ne ve nič, verjetno se pa ta rezultat pojavi tudi zaradi površnosti. Ali pa preprosto: če 15 delim z 0 ga ne delim z ničemer, torej ostane 15. Tako razmišljanje seveda ne bo pravilno in je učencu tudi treba povedati/razložiti, zakaj to ni prav.

Načinov, kako osnovnošolca prepričati, da ni mogoče deliti z 0 je več. Najprej bi učencem naročila, naj na kalkulatorju izračunajo npr. 15/5, nato s 3, z 1 in nazadnje z 0. Kalkulator bo pri deljenju z 0 izpisal ERROR. Ker vsem pokaže enako, je z računom nekaj narobe. Nato bi poskusili še drugače. Imamo 15 kock, v koliko skupin jih lahko razdelim, če je v vsaki 1 kocka? Kaj pa, če imamo 15/0? V koliko 0 skupin bi razdelili 15 kock? Torej skupin sploh ni, vseeno pa moramo v skupine razdeliti kocke. To ne gre.

Osnovnošolca bi naučili in dokončno prepričali, da 15/0 ni 15 z računom. Lahko izračunamo 15/3 = 5, ker je $5 \cdot 3 = 15$. Če imamo 15/0, bi to pomenilo, da ko rezultat pomnožimo z 0, dobimo nazaj število 15. To pa ne gre in zato s številom 0 ne moremo deliti.

Po predavanjih

Mojega odgovora pred predavanji ne bi spreminjala. Mogoče bi dodala le to, da učenec, ki narobe izračuna obrazloži, zakaj tako misli. Prosila bi, da mi razloži z računi in primeri ter uporabi znanje o množenju in deljenju $a/b = c \Leftrightarrow = a = b \cdot c$. Tako bi sam prišel do protislovja in ugotovil, da pri njegovem rezultatu nekaj ni v redu.

Zelo verjetno bi si to pravilo bolj zapomnil, če sam pride do ugotovitve, kot če bi mu takoj povedala odgovor.

Slika 10. Primer odgovora študenta pred in po predavanjih

Zanimalo nas je tudi, kako so realizacijo zadanih ciljev posodobitve pri predavanjih ocenili študenti. Iz preglednice 1 je razvidno, da so se študenti v povprečju strinjali, da so se vprašanja navezovala na tekoče predavanje (M = 3,04) in da je predavatelj pri vodenju predavanja upošteval odgovore študentov na vprašanja pred predavanji (M = 3,78). Nekoliko manj pa so se študenti strinjali, da so jim vprašanja pomagala osmisliti snov s predavanja (M = 2,56) in da so predavanja spremenila njihovo prvotno razmišljanje o vprašanju (M = 2,63).

Preglednica 1. Stališča študentov o izvedbi predavanj pri posodobitvi (stopnja strinjanja na lestvici od 1 - sploh se ne strinjam, do 4 - popolnoma se strinjam)

	M	SD
Vprašanja pred/po predavanjih so se navezovala na tekoča predavanja.	3,04	0,192
Odgovarjanje na vprašanja je meni pomagalo osmisliti snov s predavanj.	2,56	0,698
Predavanja so spremenila moje prvotno razmišljanje o vprašanju.	2,63	0,629
Predavatelj je pri predavanju upošteval naše odgovore na vprašanja.	3,78	0,424

Uporaba e-listovnika pri izvedbi vaj

Tako kot pri predavanjih nas je tudi pri vajah zanimalo, koliko časa so študentje v povprečju porabili za analizo simulacij v e-listovniku. Študentje so ocenili, da so tedensko za diskusijo in zapise v e-listovniku pri vajah porabili med 15 in 60 minut, v povprečju 38,3 minute. Večina študentov (85,2 %) si je posnetke v e-listovniku ogledala individualno, ostali pa skupinsko (14,8 %). Pri tem si je večina študentov (70,4 %) ogledala le predlagani časovni interval oz. del simulacije, na katerega se je navezovalo vprašanje, 14,8 % študentov si je običajno ogledalo celoten posnetek, ostali (14,8 %) pa so se zanesli na spomin izvedbe simulacije z vaj in si posnetka niso ogledali. Četrtina študentov (25,9 %) je diskusijo o vprašanjih izvedla z uporabo e-listovnika, četrtina (25,9 %) s pogovorom v živo, ostali (48,1 %) pa so diskutirali preko družabnih omrežij (npr. Facebook). Ker uporaba foruma v e-listovniku ni bila obvezna, se je tako izkazalo, da se študenti te funkcije e-listovnika večinoma niso želeli posluževati. Zanimalo nas je tudi, kaj je bil »srž« diskusije med člani skupine. Večina študentov (76,9 %) je čas v diskusiji posvetila usklajevanju mnenj o tem, kar so si ogledali na posnetku in morali analizirati. Manjši delež študentov (23,1 %) pa je ta čas posvetil predvsem razdelitvi dela znotraj skupine. Porazdelitev vlog znotraj skupine smo preverili tudi z vprašanjem, kateri je bil prevladujoči način zapisovanja sklepa o simulaciji. Večina študentov (92,6 %) je odgovorila, da so se zapisovalci izmenjevali, le manjši delež študentov (7,4 %) pa je imel »stalnega zapisovalca« skupine. Prvotni zapis sklepa, ki ga je oblikoval eden izmed članov skupine, je več kot polovica študentov (59,3 %) še dopolnila. To pomeni, da so prebrali zapisano, reflektirali in po potrebi dopolnili/preoblikovali.

Zanimalo nas je tudi, kako so realizacijo zadanih ciljev posodobitve pri vajah ocenili študenti.

Iz preglednice 2 je razvidno, da so se študenti v povprečju strinjali (M = 3,30), da so bila vprašanja, ki so jim bila zastavljena ob posnetku simulacije, razumljiva ter da so jim pomagala osmisliti učni namen simulacije (M = 3,00). Pisne povratne informacije so ocenili kot poučne (M = 3,26), ustrezne (M = 3,26) in koristne (M = 3,04).

Preglednica 2. Stališča študentov o izvedbi vaj pri posodobitvi (stopnja strinjanja na lestvici od 1 - sploh se ne strinjam, do 4 - popolnoma se strinjam)

	M	**SD**
Zastavljena vprašanja v Mahari o posnetku simulacije so bila razumljiva in jasna.	3,30	0,542
Zastavljena vprašanja v Mahari o posnetku simulacije so mi pomagala osmisliti učni namen simulacije.	3,00	0,734
Pisna povratna informacija na Mahari je bila ustrezna.	3,26	0,594
Pisna povratna informacija na Mahari je bila koristna.	3,04	0,706
Pisna povratna informacija na Mahari je bila poučna.	3,26	0,656

Evalvacija ciljev raziskave

Na osnovi dobljenih rezultatov lahko povzamemo doseganje ciljev raziskave in načrte za prihodnjo izvedbo predmeta. Eden od namenov uporabe tehnologije s sodobnimi učnimi pristopi je bil izboljšanje komunikacije med udeleženci in povečanje vključenosti študentov v učni proces. Ta cilj je bil nedvomno dosežen. Študenti so preko e-listovnika redno in obširno odgovarjali na vprašanja. Pri delu z e-listovnikom študenti niso imeli omembe vrednih tehničnih težav, je pa bil sam način dela zanje časovno nekoliko obremenjujoč. Bairral in Santos (2012) sta ugotovila podobno, da se z rabo e-listovnika aktivnost študentov pri učenju poveča. Povečano aktivnost študentov in tudi interakcijo med njimi pa lahko dosežemo tudi s sodelovalnim učenjem. T. Prodromou (2017) je v svoji raziskavi ugotovila podobno kot mi, da je gledanje videoposnetkov o obravnavanih matematičnih vsebinah spodbudilo med bodočimi učitelji bogato diskusijo o teh vsebinah in povečalo interakcijo med njimi. Tudi Sen in Hava (2020) sta ugotovila, da so bili bodoči učitelji matematike pri obrnjenem učenju bolj vključeni v učni proces, gledanje videoposnetka pred predavanji pa jih je spodbudilo, da so prišli k učnim uram pripravljeni na obravnavo učne vsebine.

Drugi namen je bil izboljšanje kvalitete analiz simulacij in ozaveščanje študentov o pojavih pri poučevanju, na katere sicer študentje niso pozorni. To smo želeli doseči z rednim snemanjem simulacij in objavljanjem posnetkov ter vprašanj, ki so se navezovala na pomembne didaktične aspekte pri poučevanju. Študentov snemanje ni motilo, posnetki so bili tehnično ustrezni. Milman (2012) namreč kot eno izmed težav pri uporabi videoposnetkov v učne namene navaja slabo kvaliteto posnetkov. Tudi drugi namen posodobitve je bil nedvomno dosežen. Študenti so si posnetke lahko ogledali in imeli so več časa za analizo in diskusijo. Med njimi se je razvila bogata diskusija o pomembnih didaktičnih elementih, katera so analizirali preko ogleda videoposnetka dela učne ure matematike. Podobno so Sivakumar idr. (2013) ugotovili, da so diskusije med študenti preko družabnih omrežij in spletnega učnega okolja povečale interakcijo in komunikacijo med študenti ter tako izboljšale kakovost učenja.

Tretji namen je bil izboljšati raven refleksije študentov in ozaveščati študente o lastnih subjektivnih teorijah. S stopnjo doseganja tega namena nismo tako zadovoljni. Z vprašanji pred predavanji smo veliko izvedeli o subjektivnih teorijah študentov. Med predavanji smo te teorije običajno omenili, jih upoštevali pri podajanju razlage, nismo pa izvedli diskusije o njih, saj smo menili, da bodo študentje to naredili sami v okviru ponovnega odgovora na vprašanje. Izkazalo se je, da se je to zgodilo le ob redkih primerih in da je potrebna »živa« diskusija. Lo idr. (2017) pravijo, da lahko z obrnjenim pristopom bolje izkoristimo čas pri predavanjih »v živo«, z diskusijo v razredu pa tudi lažje spodbudimo in miselno usmerimo študente k bistvu problema (Chen in Looi, 2007). Še posebej pomembno je, da s študenti pri pouku »v živo« obravnavamo zahtevnejše koncepte (La-Marca in Longo, 2017). Tudi v našem primeru bi lahko v pouk intenzivneje vključili obrnjeno učenje. Študenti so namreč premisleke o situacijah pri poučevanju naredili že pred predavanji, med predavanji pa bi lahko spodbudili diskusijo, v kateri bi študenti predhodne premisleke povezali s teoretičnimi spoznanji posredovanimi v gradivih pred predavanji in na predavanjih in tako teoretično znanje uporabili pri razreševanju realnih učnih problemov. Podobno težavo smo zasledili pri vajah. Diskusije študentov ob simulacijah so bile intenzivne, a pogosto niso presegle začetnih subjektivnih teorij študentov. To smo lahko opazili iz ravnanj študentov pri izvajanju simulacij in pri odgovarjanju na vprašanja.

Študenti so npr. še vedno pri frontalnem reševanju primerov pred tablo obravnavali napake učenca nevpadljivo »po tiho«, saj so prepričani, da je to do učenca vljudno, prijazno in niso prepoznali tega dogodka kot priložnost za učenje celotnega razreda. Še vedno je tudi ostalo prepričanje, da če učitelj učencu nekaj razloži, učenec to razume na način, kot je predvidel učitelj. To, da je razlaga edini način pridobivanja matematičnega znanja, pa so nekateri študenti uspeli preseči in so v pouk v večjem deležu vključevali pogovor ter načrtovali več miselnih aktivnosti za učence. Še vedno pa je bolj ali manj ostalo pri študentih prepričanje, da so matematični problemi le za nadarjene učence, saj jih študenti večinoma niso vključevali v naloge na učnih listih oz. so jih pripravili le za učno zmožnejše. Hj. Ebil idr. (2020) so raziskali učinke uporabe e-listovnika pri pouku in ugotovili, da se je pri študentih izboljšala raven refleksije in da so študenti v večji meri začeli uporabljati višje miselne procese. Menimo, da je za doseganje tega cilja, še posebej pri vsebinah, ki so vezane na subjektivne teorije študentov, zelo pomembno podati študentom povratno informacijo, ki pa ni oblikovana na način »pravilnega« odgovora na vprašanje, ampak kot priložnost za izboljšavo. Študenta je tako v povratni informaciji potrebno z nadaljnjimi vprašanji spodbuditi k ponovnemu premisleku in refleksiji o odgovorih na zastavljena vprašanja. Kot pravita Zellers in Mudrey (2007) e-listovnik nudi podporo učnemu procesu študenta, če lahko študent na ta način spozna svoje učne primanjkljaje in jih izboljša. V teh pogledih torej vidimo možnost in priložnost za izboljšavo in doseganje zastavljenega cilja. Druga možnost, ki se v tem kontekstu odpira je, da izkoristimo priložnosti, ki nam jih daje obrnjeno učenje in z diskusijo nadaljujemo pri naslednjih vajah »v živo«, kjer lahko z ustreznimi vprašanji in komentarji usmerimo razmišljanje študentov v pravo smer oz. ga dvignemo na višjo raven.

Summary

Over the last few decades, the development of digital technology has given rise to modern teaching and learning in the field of pedagogy and didactics that focuses on the use of ICT in education. Particularly in the higher education system, emphasis is placed on teaching and learning through experience, collaboration, blended and flipped learning approaches. E-portfolios also have an important role in monitoring and supporting the learning process.

These approaches and the Mahara collaborative online learning environment are the foundations on which we have elaborated the updated version of the subject Basics of Didactics of Mathematics, which is attended by students in the second year of the course Two-Subject Mathematics Teacher at the Faculty of Education in Ljubljana. The introduction of the new, updated version of the subject arose from the desire to achieve the best implementation of the content goals in this subject. Therefore, we first sought to overcome the objective limitations we encountered in conducting analyses and discussions (lack of time, "non-repeatability" of simulations); secondly, to improve communication between all participants in the learning process (in terms of broader and more intensive involvement of all participants); and thirdly, to encourage students to develop higher thinking processes (synthesis, evaluation and creation) and thus improve the quality of execution of the whole subject. Above all, we also wanted to achieve a paradigm shift in students' understanding of mathematics teaching. For this purpose, we used a blended teaching approach in both the labs and lectures. Teaching outside the classroom was performed via the Mahara collaborative online learning environment, into which we incorporated elements of flipped learning and collaborative learning. After the implementation of the update, we sought to find out, using questionnaires and content analysis of the e-portfolios, to what extent we had realized the set goals of the subject update. We found that communication between the participants improved and that student engagement in the learning process increased. By using the e-portfolio, students regularly and thoroughly answered questions about the lectures and simulations during the lab hours. The second purpose of the update was also undoubtedly achieved. Students developed a lively discussion about important didactic elements, which they analysed by watching a video clip of part of the mathematics lesson. The third purpose of the update was to improve students' level of reflection and increase their awareness of their own subjective theories (which is related to change in learning paradigms). The degree to which this goal was achieved was felt to be not entirely satisfactory. From the questions before the lectures, we learned a lot about the students' subjective theories. During the lectures, we usually mentioned these theories and took them into account when giving the explanation, but we did not conduct a discussion about them, as we thought that the students would do it themselves in the context of re-answering the question. It turned out that this happened only in rare cases and that a lively discussion was necessary.

Similarly, in the labs, students' discussions in groups and the feedback they received did not help them to move beyond their initial subjective theories. Based on the results, in future implementation of the subject, we would make changes in the planning of activities related to interaction between teachers and students. We would continue with the questions about didactic situations, which students should answer individually in the e-portfolio before the lecture, and also with recording most of the simulations and publishing the recordings in the e-portfolio. However, we would abandon the post-lecture questions and replace these with a live discussion during the lectures about the students' answers. We would also change the manner of simulation analysis. The selected key elements and conceptually more complex elements of the simulation would be discussed live immediately after the simulation. The questions in the e-portfolio, would remind students of a number of important technical aspects of simulations that students could think about individually or in groups.

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REVIJA ZA ELEMENTARNO IZOBRAŽEVANJE
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CHARACTERISTICS OF AN OUTSTANDING MUSICAL TALENT - A CASE STUDY

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Abstract/Izvleček The purpose of this study is to investigate the expression of thirty-two characteristics of a musically talented person in various life periods (from three to thirty-five years of age), in a case study of an internationally renowned musician and organist, Aleksey Vylegzhanin. The results show that the expression of the characteristics of his musical talent increased with age. With enough rehearsal and support from the environmental factor, his characteristics increased to a level above average, compared to his peers. These were also predispositions for the musical development of the organ virtuoso.

Keywords:
giftedness, musical talent, outstanding talent, case study, organ virtuoso.

Značilnosti izjemnega glasbenega talenta – študija primera

Namen študije je raziskati izraženost dvaintridesetih značilnosti glasbenega talenta v različnih življenjskih obdobjih (od 3. do 35. leta) s študijo primera mednarodno priznanega glasbenika, orglavca, Alekseya Vylegzhanina. Rezultati kažejo, da se je njegova izraženost značilnosti glasbenega talenta s starostjo ob zadostni količini vaje ter podpori okoljskih dejavnikov stopnjevala v vse bolj nadpovprečno v primerjavi z vrstniki. Prav to pa so bile predispozicije za glasbeni razvoj orgelskega virtuoza.

Ključne besede:
nadarjenost, glasbeni talent, izjemen talent, študija primera, orgelski virtuoz.

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Introduction

The long, rich organ tradition with excellent organ virtuosos and instructors continues and is increasingly distinguished by a younger generation of extremely talented organ virtuosos. Among these, we can currently recognize on the organ scene Thomas Ospital, Nathan J. Laube, Raul Priet Ramirez, Paolo Oreni, Martin Schmeding, Ulrich Walther, Gunther Rost, Balázs Szabo, László Fassang, Konstantin Volostnov, Cameron Carpenter, and Aleksey Vylegzhanin – the participant in our research. Many organ virtuosos or concert performers also establish themselves as organ instructors and members of juries at internationally recognized competitions. For organists who decide to pursue a professional career, the international space offers study fields and education at a high professional level, at internationally recognized institutions or music universities such as the Paris Conservatory, the State University of Music and Performing Arts Stuttgart, the University of Music and Theatre Leipzig, the University of Music and Performing Arts Graz, the University of Music and Performing Arts Vienna, Liszt Ferenc Academy of Music in Budapest, the Royal Academy of Music London, the Royal Conservatory The Hague (University of the Arts The Hague), Eastman School of Music Rochester, and many others. Studying at a university is considered the crown of music education, during which the earlier periods of musical development play an important role. The developmental paths of virtuosos differ, as each talent represents an individual with differently expressed characteristics. A holistic study of an outstanding musical talent, an organ virtuoso, and the expression of characteristics in various life periods, however, is the main purpose of the present study.

In dealing with an outstanding talent, we can rely on several theories, including the Pentagonal Implicit Theory of Giftedness (Sternberg and Zhang, 2004). The Pentagonal Implicit Theory of Giftedness summarizes five criteria that define an individual as gifted. The *excellence criterion* requires that an individual stand out as above average in one or more areas. This is complemented by a *rarity criterion,* which states that an individual who is gifted, be exceptionally outstanding in a particular area, which is a rarity in comparison with the majority - average. The *productivity criterion* states that the criterion by which an individual is assessed as above average or "superior" leads or potentially leads to productivity, whereby the "superiority"

of the individual must be proven by one or more tests that are valid assessments, and this is a *demonstrability criterion*. The last is called the *value criterion*, according to which a person marked as gifted must be assessed as above average by the society in which he lives and works, and high results of a gifted person must be assessed as favourable to or for the good of society (Sternberg and Zhang, 2004).

The review of the literature shows that the terms *giftedness* and *talent* are often used interchangeably. Gagné's Differentiated Model of Giftedness and Talent (DMGT) (2005) has established definitions for both concepts, since Gagné's first presentation in 1985, explaining that giftedness refers to innate abilities, while talent refer to skills that can be developed and which help us achieve good results (Gagné, 2004). In both concepts, an individual must rank in the top ten percent of the best among their peers in at least one area. The model shows the transformation of specific innate abilities into outstanding abilities specific to a particular professional field, with the author arguing that you can almost certainly not become talented without having been previously gifted (Gagné, 2005). In addition to Gagné's Differentiated Model of Giftedness and Talent (2005), a clearer picture in terms of distinguishing giftedness and talent is provided by the Munich Model of Giftedness (Heller et al., 1992, 2001, in Heller et al., 2005; Heller and Schofield, 2008; Ziegler and Heller, 2000), the Munich Dynamic Ability Achievement Model (Perleth, 1997, 2000, 2001, in Heller et al., 2005), and the Pyramid of Talent Development (Piirto, 2008), which all begin to show the developmental process of transition from innate abilities, potential or giftedness, on the one hand, to achievements, developed abilities or talent, on the other.

When studying the characteristics of the development of a musician's talent (in our case an organist), it is considered that, in this specific field, we are talking about musical talent and not about giftedness. Based on the acceptance of the theoretical distinction between giftedness and talent, McPherson and Williamon (2006) adapted Gagné's Differentiated Model of Giftedness and Talent (2005) and named it the Differentiated Model of Musical Giftedness and Talent. In addition to Gagné's model, they propose at least eight different types or areas of musical talent: performing, improvising, composing, arranging, analysing, appraising, conducting and teaching. They are all related to professional occupations and fields of disciplines from which musicians can make a living.

The findings of many authors are related to the development of musical talent and the stages of its development (Matuszewska, 1990, in Garces-Bascal, 2014; Hargreaves and Galton, 1992, in Garces-Bascal, 2014; Reis, 2009). The development itself is conditioned by the characteristics of the musical talent and the influences of its factors. The primary factor in musical success and the condition for learning music and acquiring vocal-instrumental performance competences involves *musical abilities*, the level and quality of which are among the basic predispositions, the selection criteria at the beginning of special music education and the basis for effectiveness in musical activity, performance skills and the development of expertise and professional careers (Bogunović, 2008). The development of musical ability in the literature often refers to the topic of musical development, which brings a general framework of characteristics for a certain age period (Kovačič, 2016). According to B. Sicherl Kafol (2001), musical development includes the development of elementary musical abilities, such as a rhythmic and melodic ear, and higher-order musical abilities, such as aesthetic and evaluation skills, a harmonic ear, and analytical listening.

An important aspect of the giftedness phenomenon is creativity (Runco, 1993, in Sternberg, 2004). Many characteristics of creative people can be found in the literature, such as flexibility, fluency, originality, divergent thinking (musical fantasy) and creative problem solving (Kovačič, 2016). When dealing with musical talent, the context of creativity is reduced to *musical creativity*, which belongs to a wide range of areas of human creativity. J. Haroutounian (2009a) defines musical creativity as a process of musical creation that involves inner realization and interpretive manipulation of sound and communication with others in a unique direction, while A. Padula (2009) defines it as the ability through which persons can express their own personal relationship with the realm of sound; they use the abilities of thought, body, and soul. It is found in musical activities related to creating/producing music: listening, performing, conducting, arranging, composing, etc. Musically gifted and talented people have a high level of this ability; Gardner defines it as musical intelligence, one aspect of which is musical creativity (Kovačič, 2016).

One of the eight types of musical talent in the Differentiated Model of Musical Giftedness and Talent (McPherson and Williamon, 2006) is performing talent. *Musical performance* is inextricably linked to dedicated work and achievements and early recognition of talent, which depends on the rapid development of performance skills and abilities (Kovačič, 2016).

According to Sloboda and Ericsson, over time, instead of an innate musical capacity, deliberate practice becomes a decisive factor in musical talent (Haroutounian, 2009a). In the Slovenian school area, the term musical performance refers to musical expression, which means the performance of music and is reflected in performance achievements (Kovačič, 2016). According to the Curriculum for Music Education (Holcar et al., 2011), the areas of music performance are as follows: singing, playing an instrument, and movement-dance. We assume that the aesthetics of musical expression in musically talented students is expressed above average, compared to peers. We talk about the aesthetics of musical expression when the pupil's musical performance or achievements reflect a high level of knowledge, ability, skill, technique, interpretation and a sense of art (Kovačič, 2016).

Musical knowledge and *musical activity* are also important and well-represented areas of a musical talent. When we talk about the musical knowledge of musically talented pupils, we mean primarily knowledge relating to the acquisition of the professional vocabulary and rules of musical language or music theory; J. Mills and McPherson (2006) use the term musical literacy. According to B. Sicherl Kafol (2001), musical knowledge in terms of the integrity of the music learning processes is always the result of the development of musical ability and skill and includes concepts and musical vocabulary. Musical knowledge and the level of ability are related to the length of formal learning of music (Ericsson et al., 1990, in Dai and Schader, 2002). Providing early musical activities is the domain of preschool education and the family, until the child enters school. The author Sloboda found that children who were highly exposed to and engaged in music through informal musical activity before entering school showed noticeable, above-average musical ability, compared to their peers upon entering school (Haroutounian, 2009b). Early involvement in appropriate musical activities may influence the development of absolute pitch (Haroutounian, 2009b; Chin, 2003), but it is not necessary for absolute pitch to develop. Referring to musical activities, it is interesting to note that engaging in music and later success are not necessarily related. S. A. O'Neill (1997) states that more girls are involved in musical activity at school and are also more successful than boys, while men later dominate the music professions and achieve higher success rates in music careers.

It draws on several studies showing that musical achievement depends, not only on an individual's musical ability, but also on the interaction of cognitive, social, environmental, and motivational factors, the individual's experience, education, aspirations, attitude towards music and the process of musical learning.

Among the *non-musical characteristics*, the following determinants of musical talent are important: motivation, concentration, perseverance, readiness to work, learning, interest, and listening and following instructions (Kovačič, 2016). D. Sisk (2009) sees motivation as a driving force behind all individual actions. It is a process that involves initiating, persevering, and guiding one's own, self-oriented behaviour. According to M. Juriševič (2012), motivational initiators include interest, goals, values and complexity, and motivational enhancers include self-esteem and the reasons that pupils attribute to their success or failure in learning. Factors such as hard work, perseverance, passion, and social competence are important for outstanding achievement (Rinn, 2012, in Worrell, Olszewski-Kubilius and Subotnik, 2012). Orlick and Partington (1988, in MacNamara and Collins, 2009) state that the development of excellence includes goal setting, realistic evaluation of achievements, imagination, dedication, quality of exercise, coping with pressure and motivation.

In the context of a holistic, integrated, multidimensional view of a musical talent, six major areas of characteristics of a musical talent were identified: musical abilities, musical creativity, musical performance, musical knowledge, musical activities and non-musical characteristics. Theoretical Model of Characteristics of Musical Talent (Figure 1) was chosen, in which a wide range of these characteristics are included (Kovačič, 2020, 2016; Kovačič, Blažič and Črčinovič Rozman, 2015; Kovačič and Črčinovič Rozman, 2014; Črčinovič Rozman and Kovačič, 2010; Blažič, Črčinovič Rozman and Kovačič, 2009).

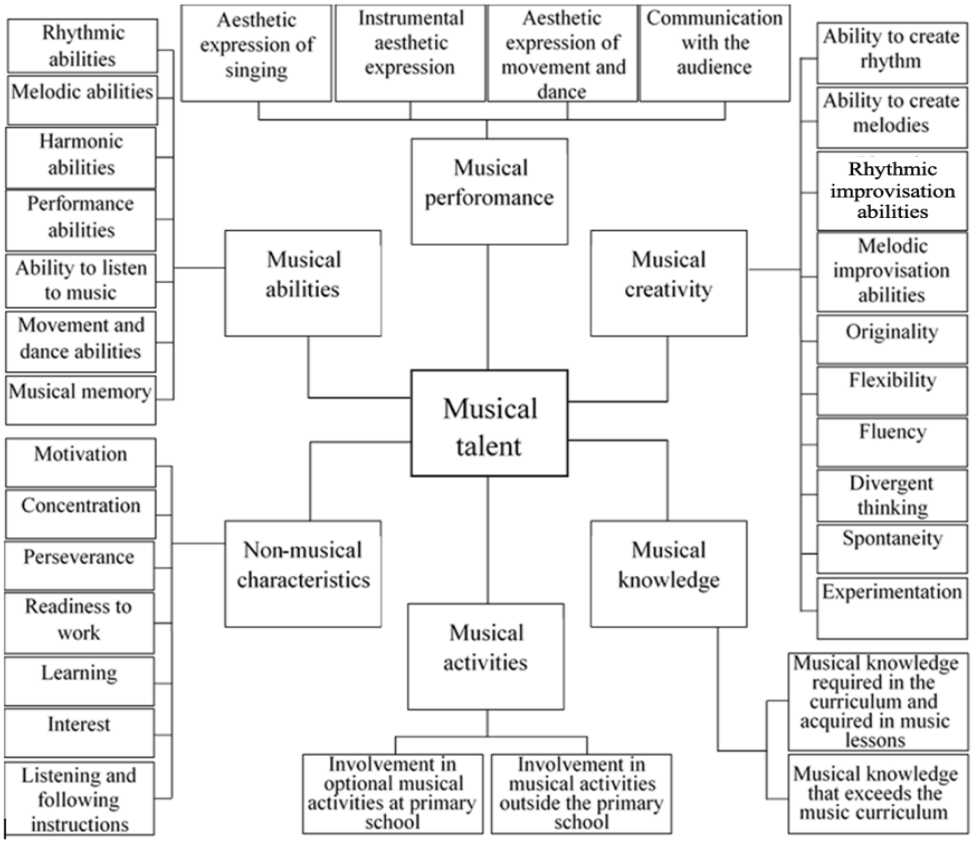

Figure 11. The Theoretical Model of Characteristics of a Musical Talent (Kovačič, 2016, p. 194)

Method

Goals

The purpose of the research is to investigate the expression of the characteristics of an outstanding musician, with an outstanding musical talent in different life periods. The participant in the case study is a professional organist, Aleksey Vylegzhanin (Russia/Austria), hereinafter A. V.

Research questions

In the study, we explored whether the characteristics of Aleksey Vylegzhanin's musical talent were above average in all six areas (musical ability, musical creativity, musical performance, musical knowledge, musical activity and non-musical characteristics), what is the deviation of the considered characteristics from the average population or peers at different life stages, and whether and how the expression of these characteristics were enhanced or escalated through different life stages of the participant A. V.

Measurement instruments

For the research, we developed and used a modified measurement instrument (a questionnaire), which had been applied in a previous study (Kovačič, 2016). The questionnaire includes a set of 32 characteristics of a musical talent, for which it is necessary to note deviation from the average population or peers in different life stages: early childhood (3–6 years), middle childhood (6–8 years), late childhood (9–11 years), early adolescence (12–14 years), middle adolescence (15–17 years), late adolescence (18–20 years), and early adulthood (20–35 years). Deviations of characteristics are assessed by periods using a 7-point rating scale containing the following levels: 1. very below average, 2. moderately below average, 3. slightly below average, 4. average, 5. slightly above average, 6. moderately above average, 7. very above average. Thirty-two criteria (characteristics) are divided into six areas for assessing the characteristics of a musical talent: musical ability (7 criteria), musical creativity (10 criteria), musical performance (4 criteria), musical knowledge (2 criteria), musical activity (2 criteria) and non-musical characteristics (7 criteria).

Process

The study was conducted remotely because of the COVID-19 epidemic. Data collection took place in April 2020. A questionnaire was administered to the study participant A. V.; it was sent in electronic form (in English). The participant returned it in electronic form after one week. The review of the answers was followed by a consultation conversation with the participant via videoconference (MS Teams application). A. V. read the case study before publication and approved the publication of the findings.

Participant

Aleksey Vylegzhanin (Russia/Austria, 1987) is an outstanding artist and a prize-winner in many renowned national and international competitions, who has been successfully building his organ career. Apart from the organ, he regularly performs on other keyboard instruments (piano, harpsichord) and actively composes.

He received his first music experiences from his parents – professional musicians (father – opera singer and mother – conductor). At the age of six, he began his formal music education with piano lessons at the Music lyceum in Novosibirsk (Russia), which specializes in children with extraordinary musical talent. His interest in the organ developed a few years later. Subsequently, A. V. continued his music education at the Novosibirsk M. I. Glinka State Conservatory (Russia), where he studied organ in the class of Professor Natalya Baginskaya. After his first organ degree in 2010, he continued his organ studies at the University of Music and Performing Arts in Graz (Austria) with prof. Gunther Rost, where in 2018, he received his master's degree with honour. He is currently studying church music at the University of Music Graz.

A. V. began performing his first concerts at the age of six, and at the age of nine began to receive numerous awards at national and international competitions. During his musical education, he attended several master classes with renowned musicians: D. Roth, Z. Szathmary, L. Lohmann, J. van Oortmerssen, E. Bellotti, W. Porter, and N. Hakim. He regularly gives concerts in Russia, Slovenia, Croatia, Germany, Austria, and England, as a solo organist or in collaboration with renowned musicians, choirs, orchestras, and chamber ensembles. Among the most important concerts are the gala concert in Moscow Cathedral (2009), regular solo concerts in the Cathedral and Church of the Sacred Heart of Jesus in Graz (Austria), several projects in Mumuth Concert Hall in Graz: *organ@mumuth* (2013), *Petr Eben: Faust* (2014), *Organ on Stage* (2015), *Schlafes Bruder* (2016), projects with the composer Reiko Yamada as part of the *Orgelfrühling Steiermark* festival (2018 and 2019), collaboration with an internationally renowned ensemble *Klangforum Wien* (2019), and many others.

He is especially challenged to perform organ works by modern and contemporary composers, as is evident from the CDs that he has recorded: *Klaus Lang – Organ Works Vol. 1* (GOD Records) and *Aleksey Vylegzhanin plays Naji Hakim* (Klangdebüts, Vol. 53). Apart from classical music, he is also active in jazz, collaborating with renowned musicians and ensembles.

He recorded a CD of his own compositions with the Slovenian jazz singer Lina Rahne. Currently, he is working on a new album with his own arrangements of Mozart's opera arias. In addition to giving concerts, he also works as an organist in many churches in Graz and the surrounding area, where he collaborates with numerous choirs and orchestras, and has a special interest in interdisciplinary performances.

Qualitative case study results and discussion

Musical ability

In early childhood, in rhythmic ability (1), melodic ability (2) and harmonic ability (3), it was shown that A. V. did not deviate from the average. Between 6 and 8 years of age, he began to deviate slightly above the average and in early adolescence moderately above the average, compared to his peers. The leap occurred at the age of fifteen, when he began to deviate very much above average from his peers. In early childhood, performance abilities (4) were slightly below average, between 6 and 8 years of age they were average, and in late childhood (9–11 years) he began to deviate slightly above average, compared to his peers. The latter progressed to moderately above average between the ages of 15 and 17, and the leap occurred at the age of eighteen when he began to deviate very much above average, compared to his peers. The ability to listen to music (5) escalated from average to moderately above average throughout childhood. The leap occurred in adolescence when he began to deviate very much above average from his peers, and this deviation persisted well into the last studied period of his life (early adulthood, 20–35 years). Movement and dance abilities (6) were moderately below average at all of the relevant life stages. Musical memory (7) grew from slightly below average to slightly above average in childhood (3–6 years, 6–8 years, 9–11 years). Between the ages of 15 and 17, he began to deviate moderately above average, and at the age of eighteen, very much above average, compared to his peers.

We can deduce that the fastest deviation began in rhythmic ability, melodic ability, and harmonic ability and in the ability to listen to music, in which A. V. started deviating slightly above average from his peers at the age of six. In the ability to listen to music, this deviation rose to very much above average in early adolescence from the age of twelve, and in rhythmic ability, melodic ability, and harmonic ability from the age of 15.

The latter confirms the claim of E. Winner and Martin (2000) that the essential characteristic of a musically gifted child is sensitivity to the structure of music - tonality, harmony, rhythm, and the ability to hear the expressive qualities of music. Sensitivity to the structure allows the child to remember the music and easily sing or play it again, transpose, improvise, invent, or rework. Performance ability and musical memory were slightly below average in early childhood (3–6 years). However, by the age of eighteen, these had developed to a level very much above average, compared to his peers. It should be noted that the research participant began attending the Music lyceum in Novosibirsk (Russia) at the age of six, an institution specializing in children with extraordinary musical talent, which explains that A. V., until the age of fifteen, was being measured against and compared with peers who were also extremely talented. In contrast to musical ability, movement and dance ability remain moderately below average in all studied periods of his life. The latter can be explained as a characteristic of talent that was expressed in childhood as below average, compared to (extremely talented) peers, and A. V. also stated that this characteristic did not develop because he showed no interest in it, as a result of which there was not enough motivation and practice present.

Musical creativity

A. V.'s ability to create rhythm (8), ability to create melodies (9) and rhythmic improvisation ability (10) were, in his early childhood, developed slightly above average, compared to his peers and, in later childhood (6–11 years), developed to an average level. He began to deviate from his peers in these characteristics slightly above average in adolescence, so that he was already above average in the period between 18 and 20 years of age (late adolescence), and considerably above average after the 20th year of age. Melodic improvisation ability (11) was in childhood (up to the eighth year of age) average, in late childhood and early adolescence they rose to slightly above average and in middle adolescence (15–17 years) to moderately above average, compared to his peers. The leap where these abilities developed to a level very above average occurred after the age of eighteen. Observation of originality (12) and flexibility (13) shows that A. V. did not deviate from the average until the age of eight. In late childhood and early adolescence (9–14 years), he was slightly above average and in middle adolescence moderately above average.

In late adolescence and early adulthood (18–35 years), he began to deviate from his peers, becoming considerably above average in these characteristics. A. V.'s fluency (14) was average in early and middle childhood; subsequently, over a period between the ages 9 and 14, it moved to slightly above average. In later adolescence, A. V. was already moderately above average in this characteristic, compared to his peers, and in early adulthood (20–35 years) a leap occurred when he began to deviate to a level very much above average. A. V.'s divergent thinking (musical fantasy) (15) was average throughout his childhood, after which it developed to slightly above average in adolescence (12–17 years). A major leap occurred in late adolescence (from the age of eighteen onwards), when he began to deviate considerably above average from his peers. The same applies for spontaneity (16). A. V.'s experimentation (17) did not deviate from the average throughout his childhood and almost his entire adolescence; however, there was subsequently a leap in late adolescence (18–20 years), when he began to deviate from his peers to moderately above average. Even in early adulthood (20–35 years), his experimentation was still moderately above average.

In melodic improvisation ability, originality, flexibility, fluency, divergent thinking (musical fantasy), spontaneity and experimentation in childhood, at least until the age of eight, there was no deviation from the average. In early childhood (3–6 years), the deviation in the ability to create rhythm, the ability to create melodies and rhythmic improvisation ability was even slightly below average. All these characteristics developed to a level very much above average by the age of twenty, except for experimentation, where there was no deviation from the average until the age of seventeen. Between the ages of 18 and 35, there was a moderately above average deviation from peers. These results can be related to pedagogical experience that musically talented students are not necessarily extremely successful in musical improvisation in early and middle childhood, owing, among other things, to a lack of experience (Kovačič, 2016). We see musical improvisation ability (as a set or a favourable combination of all necessary abilities and properties) and its development as a process that is manifested in pupil's improvisation. Appropriate support or providing opportunities for improvisation can have a favourable effect on the development of musical improvisation ability or on the performance of pupils in tasks that require improvisation. In the case of A. V., this escalation was shown. The development spread to many content and experience paths and led to the realization and fulfilment of talent in these considered aspects of characteristics.

As stated by J. Haroutounian (2009a), creativity is realized during musical development, through musical improvisation or composing or compositional activities, interpretively through musical performance, and further includes creative listening and critique. At an early stage of musical learning, it is noticeable through musical improvisation or playing. Nowadays, the notion that musical creativity can be expressed mainly through composition and improvisation has been re-evaluated. Music educators argue that creativity lies at the heart of all musical activity and is found in a variety of tasks: listening, analysing, evaluating music, performing, improvising, and composing. Creative listening, analysing, and evaluating include active involvement in discovering, comparing, and evaluating rhythmic, melodic and harmonic elements, musical structures, styles, etc. In execution, individuals can express creativity through personal decisions - e.g., at dynamic, tempo, agogics, sound colour, and ornament. In improvising and composing, however, individuals show creativity in choosing elements consistent with their theoretical knowledge and practical experience, combining these in new ways: rhythmic and melodic patterns, repetition and variation, tonal stability, musical form and style, and so on. All this was realized to a certain extent with the participant A. V. during the quality education and experience he gained.

Musical performance

A. V.'s aesthetic expression in singing (18), from childhood to early adulthood (3–35 years), was moderately below average, compared to his peers. Instrumental aesthetic expression (19) throughout childhood was average, after which it developed to a level slightly above average in adolescence (12–17 years). A major leap occurred in late adolescence (from the age of eighteen onwards), when A. V. began to deviate from his peers to considerably above average. Aesthetic expression through movement and dance (20), throughout all his life stages – from early childhood to early adulthood (3–35 years), remained slightly below average, compared to his peers. A. V.'s communication with the audience (21) in childhood (3–11 years) was slightly below average, compared to his peers, while in adolescence (12–17 years) it was average. He rose slightly above average in late adolescence and early adulthood (18–35 years).

In instrumental aesthetic expression in childhood there was no deviation from peers (average), while communication with audience in childhood was slightly below average.

Instrumental aesthetic expression developed to a level considerably above average in late adolescence, while communication with the audience reached a level above average in late adolescence (up to the age of 35). The extremes occur in aesthetic expression through singing, which in all life periods remained moderately below average, compared to his peers, and aesthetic expression through movement and dance, which in all life periods remained slightly below average, compared to his peers. The results suggest consistency with Sloboda and Erickson's finding that, over time, deliberate practice becomes a decisive factor in musical talent, instead of innate musical capacity (Haroutounian, 2009a). A. V. advanced in aesthetic expression and communication with the audience because of the appropriate amount of practice. Both could be substantiated by the findings of S. Baum et al. (2004), who include a sense of communication to expressiveness. Kopiez (2002, in Bogunović, 2008) sees musical communication as a process that encompasses three aspects of the participants: the performer aspect, the listener aspect, and the musical aspect. These intertwine during A. V.'s development. Moreover, there was influence and interweaving of various factors that entered during musical development, which according to Juslin (2003) can influence musical performance. These factors, which could lead to more precise answers and in-depth insight, could be related to each of the following areas: musical work (the composition itself, notation variants in the work, consultation with the composer or the composer's written comments, musical style/genre), instrument (acoustic parameters, specific aspects: colour, height, etc., technical complexity), performers (structural interpretation, expressive intention in relation to the mood at work, emotional-expressive style, technical skill, motor precision, mood while playing an instrument, interaction with co-performers, perception of the audience or interaction with the audience), listeners (musical preferences, musical knowledge, personality, current mood, state of attention), and context (acoustics, sound technology, listening context (e.g. recording, concert), other individuals present, visual performance conditions, cultural and historical requirements, and formal evaluation of performance.

Musical knowledge

Musical knowledge required in the curriculum and acquired during instrument lessons (22) remained average throughout A. V.'s childhood (3–11 years).

A major advance occurred in adolescence (12–17 years), when A. V. began to deviate to moderately above average in relation to his peers, and after the 18th year of age, when it became considerably above average. Regarding musical knowledge that exceeds the musical curriculum (23), A. V. was comparable to his peers throughout childhood (3–11 years); they were all average. In early adolescence (12–14 years), he started to deviate to a level slightly above average, in middle and late adolescence (15–20 years), he attained a level moderately above average and after his 20th year of age, scored very much above average.

Considering the musical knowledge required in the curriculum and acquired during instrument lessons, as well as musical knowledge that exceeds the musical curriculum, in A. V.'s childhood, there was no deviation from his peers (average). The deviation occurs in early adolescence, when the first characteristic changes in late adolescence to a level very much above average, while the second of these characteristics is very much above average in early adulthood. The latter can be linked to Gagné's Differentiated Model of Giftedness and Talent (2005), in which knowledge is implicitly included as a result of learning and exercise or developmental processes that take place through maturation, formal or non-formal learning and exercise. Knowledge is also included in Gagné's definition of talent (proficiency in systematically developed skills and knowledge). For the participant, the statement of B. Sicherl Kafol (2001) that musical knowledge is always the result of the development of musical ability and skill is broadly confirmed.

Musical activities

A. V's involvement in musical activities in music school (24) in all life periods was very much above average. In childhood and early adolescence (up to the age of 14), he was involved in musical activities outside the music school (25) to a moderate degree above average, compared to his peers, and from the age of 15 onwards considerably above average.

In musical activities within and outside the music school, deviations from the peer average are very high at all stages of his life, as his musical activity in music school in all life periods was very much above the peer average. Activities outside the music school were moderately above average until the age of fifteen, and subsequently very much above average.

Referring to musical activities, we can confirm the introductory findings that the provision of early musical activities, before the child's entry into school, lies in the domain of preschool education and the family, and that, as Sloboda states, children who were highly exposed to and engaged in music before entering school through informal musical activity, upon entering school show marked above-average musical ability compared to their peers (Haroutounian, 2009b). Important factors in the development of a musically talented person include, of course, the environment (school, family) and people in the environment (parents, teachers, peers), which can provide musically talented pupils with many opportunities and involvement in various musical activities. Thus, J. Freeman (2000) in his comparative study finds that the environment, especially the home, has a great influence on extremely high achievements, which can also be observed in A. V., where both parents are professional musicians. For children without home support, school conditions play a major role. The influence of both factors decreases with age. Deviation from peers was probably greatly influenced by the effective individual instruction in the instrument and, as discussed by A. Kavčič Pucihar and B. Rotar Pance (2017) in the context of dealing with an otherwise specific sample of teachers, the relationship between teacher and student.

Non-musical characteristics

Regarding motivation (26), A. V. in childhood and early adolescence (up to the age of 14) was slightly above average in motivation, compared to his peers. After the age of fifteen, his motivation was moderately above average. In childhood, concentration (27) was slightly below average, and then, in adolescence, it rose to become average (over a period of 12 to14 years) and slightly above average (between 15 and17 years). The jump from slightly above average to considerably above average concentration occurred in late adolescence (from the 18th year of age onwards). Perseverance (28) was, in all life periods (3–35 years) slightly above average, compared to his peers. Regarding readiness to work (29), it was shown that in childhood and early adolescence (until the age of 14), he did not deviate from the average. From the age of fifteen, a change occurred when he began to deviate from his peers' moderately above average level. Nor did he deviate from the average in learning (30) in childhood. In adolescence (12–17 years), he began to score slightly above average compared to his peers, and from the age of eighteen onwards, moderately above average.

Interest (31) remained at an average level throughout his childhood. In adolescence, it rose to slightly above average, compared to his peers, and from the age of twenty onwards, interest was above average. A. V. did not deviate from the average in listening and following instructions (32) in childhood. In adolescence (from 12 to 14, and then from 18 to 20 onwards), he began to deviate to a level slightly above the peer average. The greatest deviation, to moderately above average, occurred in adolescence (15–17 years). A drastic drop occurred in early adulthood when A. V. fell very below average regarding this characteristic. In motivation and perseverance, a slightly above average deviation from peers could be observed even in childhood, while in readiness to work and interest, in learning and listening and following instructions in childhood, there was no deviation from the peer average. Concentration was even slightly below average in childhood, compared to his peers. Above-average deviations in adolescence occurred in all these characteristics. A major turnaround occurred in listening and following instructions, where from slightly above average and moderately above average deviation in adolescence, there occurred a very much below average deviation in early adulthood. From this, we can find parallels with the results of a longitudinal study of psychological characteristics conducted by A. MacNamara and Collins (2009). The results showed that different combinations of psychological characteristics promote the effectiveness of the development of classical musicians, also depending on the musician's focus, level of development and maturity.

Conclusion

This study can confirm the transferability of the Theoretical Model of Characteristics of a Musical Talent (Kovačič, 2016) to various research contexts, as well as to the study of an example of an outstanding talent from a specific field of organ art. At the age of twelve, the participant in the study expressed as many as twenty-five out of thirty-two characteristics of above-average musical talent, compared to peers who were also gifted, as A. V. attended the Music lyceum, which specializes in children with (extraordinary) musical talent. The findings confirm the belief of many researchers and music educators that a child who does not possess innate musical talent (giftedness) will never achieve excellence in music.

We can also agree with the findings of more recent research that trained musicians do not differ from less trained ones in early indicators of exceptionality, but in opportunities and hours of practice (Visser, 2009). Exercise is an important factor in the development of musical talent (Haroutounian, 2009b). With the pupils' age, the amount of practice, music and instrumental lessons and engagement in various musical activities increase. This is also evident in the results of our case study, where for most characteristics, the scale escalates with age to an increasingly above-average deviation. In addition to ability and practice, we affirmed that environmental factors (family and school) are of essentially importance in the development of musical talent, which opens challenges for further research on the impact of factors on the development of musical talent at different stages of life. A special role in our future research should be given to what M. Kukanja Gabrijelčič (2014) discusses, namely "the role, mission, competencies, social intelligence and responsibility of the gifted and talented teacher in terms of working with and developing gifted students." In the context of studying outstanding musical talent, non-musical characteristics should also include perfectionism, which, according to Frost, Marten, Lahart and Rosenblate (1990, in Kranjec, 2017), as a personality trait, includes an individual's high standards. In addition, the impact of musical preferences at different life stages should be studied in depth, starting with the preschool level (Habe and Bratina, 2018), then performance anxiety, which represents a significant problem in general education, as well as in music education (Bačilja Susić, 2018), and the influence of a number of important factors included in the developmental models of giftedness that are well represented in the literature.

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NAVODILA AVTORJEM

Osnovni namen revije je povezati širok spekter teoretičnih izhodišč in praktičnih rešitev v izobraževanju ter tako spodbujati različne metodološke in vsebinske razprave. Uredniški odbor združuje strokovnjake in raziskovalce iz več evropskih držav in s tem želi ustvariti možnosti za živahen dialog med raznovrstnimi disciplinami in različnimi evropskimi praksami, povezanimi z izobraževanjem.

Revija za elementarno izobraževanje torej objavlja prispevke, ki obravnavajo pomembna, sodobna vprašanja na področju vzgoje in izobraževanja, uporabljajo primerno znanstveno metodologijo ter so slogovno in jezikovno ustrezni. Odražati morajo pomemben prispevek k znanosti oziroma spodbudo za raziskovanje na področju vzgoje in izobraževanja z vidika drugih povezanih ved, kot so kognitivna psihologija, razvoj otroka, uporabno jezikoslovje in druge discipline. Revija sprejema še neobjavljene članke, ki niso bili istočasno poslani v objavo drugim revijam. Prispevki so lahko v slovenskem, angleškem ali nemškem jeziku.

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Navodila za oblikovanje besedila

Pri pripravi besedila prispevka upoštevajte naslednja navodila:

1. Tipkopis oddajte kot dokument v programu Microsoft Windows. Nabor pisave je Times New Roman, velikost črk 12 za osnovno besedilo in 10 za povzetka v slovenskem in angleškem jeziku, literaturo in citate, če so daljši od treh vrstic, razmik med vrsticami pa je 1,5. Velikost pisave v tabelah in naslovih tabel ter grafov je 10; razmik med vrsticami pa enojni. Širina tabele naj ne presega 12,5 cm. Besedilo naj bo obojestransko poravnano. Vodilni naslovi naj bodo zapisani krepko, prvi podnaslovi ležeče, drugi podnaslovi pa navadno. Naslovov in strani ne številčite in ne uporabljajte velikih tiskanih črk.
2. Besedilo prispevka naj ne presega 38.000 znakov s presledki, vključno s povzetki, literaturo in ključnimi besedami.
3. Naslov prispevka naj ne presega 15 besed in naj bo v slovenskem in angleškem jeziku.
4. Prispevek naj ima na začetku povzetek v slovenskem jeziku ter njegov prevod v angleškem jeziku (oziroma obratno) in naj ne presega 100 besed. Za povzetkom naj bo 5 ključnih besed. Poleg povzetkov naj prispevek na koncu prispevka, pred literaturo, vsebuje daljši povzetek (500-700 besed) v angleščini, če je članek napisan v slovenščini.
5. V prispevku ne uporabljajte ne sprotnih ne končnih opomb.
6. Vire navajajte v skladu s standardom APA (American Psychological Association). V seznam literature vključite samo v tekočem besedilu navedene vire, ki jih uredite po abecednem vrstnem redu.

7. V posebnem dokumentu pošljite naslednje podatke: ime in priimek avtorja, akademski naziv, organizacijo, kjer je avtor zaposlen, elektronski naslov, naslov bivališča in naslov prispevka.

Primeri:
Knjige: priimek, začetnica imena avtorja, leto izida, naslov, kraj, založba.
Duh, M. (2004). *Vrednotenje kot didaktični problem pri likovni vzgoji.* Maribor*:* Pedagoška fakulteta.

Članki v revijah: priimek, začetnica imena avtorja, leto izida, naslov prispevka, ime revije, letnik, številka, strani.
Planinšec, J. (2002). Športna vzgoja in medpredmetne povezave v osnovni šoli. *Šport*, *50*(1), 11–15.

Prispevki v zbornikih: priimek, začetnica imena avtorja, leto izida, naslov prispevka, podatki o knjigi ali zborniku, strani, kraj, založba.
Fošnarič, S. (2002). Obremenitve šolskega delovnega okolja in otrokova uspešnost. V M. Juričič (ur.), *Šolska higiena: zbornik prispevkov* (str. 27–34). Ljubljana: Sekcija za šolsko in visokošolsko medicino SZD.

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