DIDACTICA SLOVENICA

pedagoška obzorja

2023 letnik 38

2

DIDACTICA SLOVENICA – PEDAGOŠKA OBZORJA
ZNANSTVENA REVIJA ZA DIDAKTIKO

Izdajatelji *Published by*
□ Pedagoška obzorja d.o.o.
□ Univerza v Novem mestu

Naslov uredništva in uprave *Editorial office and administration*
□ Didactica Slovenica – Pedagoška obzorja, Na Loko 2, p.p. 124, 8000 Novo mesto, Slovenija, EU

Spletna stran revije *Website of the journal*
□ http://www.pedagoska-obzorja.si/revija

Elektronski naslov *E-mail*
□ info@pedagoska-obzorja.si, chief.editor@didactica-slovenica.si

Revija Didactica Slovenica – Pedagoška obzorja je indeksirana in vključena v
Journal Didactica Slovenica – Pedagoška obzorja is indexed and included in
□ Elsevier Bibliographic Databases (SCOPUS)
□ International Bibliography of Periodical Literature / Internationale Bibliographie geistes– und sozial-wissenshaftlischer Zeitschiftenliteratur (IBZ)
□ Internationale Bibliographie der Rezensionen geistes– und sozialwissenshaftlischer Literatur (IBR)
□ Co-operative Online Bibliographic System and Services (COBISS)

Naklada *Circulation*
□ 300

Tisk *Printed by*
□ Tiskarna Cicero, Begunje, d.o.o.

2023 letnik 38 | 2

DIDACTICA SLOVENICA
pedagoška obzorja
znanstvena revija za didaktiko

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Samoučinkovitost bodočih učiteljev matematike, strokovne kompetence in karierno odločanje

Prejeto 12. 12. 2022 / Sprejeto 8. 5. 2023

Znanstveni članek

UDK 331.108.4:37.091.8

KLJUČNE BESEDE: samoučinkovitost učitelja, usvajanje strokovnih kompetenc, poklicna kariera, bodoči učitelji matematike

POVZETEK – Na podlagi teorije o samoučinkovitosti in opredelitve samoučinkovitosti učitelja je bila izvedena kvantitativna empirična raziskava, v kateri je sodelovalo 83 bodočih učiteljev matematike Pedagoške fakultete Univerze v Ljubljani. Namen raziskave je bil proučiti njihovo zaznavo samoučinkovitosti ter preveriti odnos med ocenjeno samoučinkovitostjo, oceno priložnosti usvajanja strokovnih kompetenc in namero o nadaljnji poklicni karieri. Sodelujoči so izrazili srednje veliko do veliko stopnjo učiteljske samoučinkovitosti, pri čemer je bila ocena samoučinkovitosti statistično značilno pozitivno povezana z oceno priložnosti usvajanja strokovnih kompetenc v okviru študija. Pokazale so se statistične in praktično značilne razlike v zaznavi samoučinkovitosti med študenti, ki se nameravajo zaposliti v poklicu, povezanem s poučevanjem matematike, in tistimi, ki se ne nameravajo zaposliti v pedagoškem poklicu. Prvi so v povprečju svojo samoučinkovitost ocenili višje. Kot odziv na pridobljene rezultate avtorice podajamo predloge za krepitev samoučinkovitosti bodočih učiteljev in izboljšanje kakovosti pedagoških študijskih programov s ciljem spodbujanja razvoja samoučinkovitosti pri bodočih učiteljih.

Received 12. 12. 2022 / Accepted 8. 5. 2023

Scientific article

UDC 331.108.4:37.091.8

KEYWORDS: teacher self-efficacy, acquiring professional competence, professional career, prospective mathematics teachers

ABSTRACT – Based on the theory of self-efficacy and the definition of teacher self-efficacy, a quantitative empirical study was conducted with 83 prospective mathematics teachers from the Faculty of Education, University of Ljubljana. The purpose of the study was to investigate perceptions of teacher self-efficacy and to examine the relationship between self-efficacy, perceptions of opportunities to acquire professional skills during studies and intentions to pursue a professional career. Participants expressed moderate to high levels of teacher self-efficacy, and the sense of teacher self-efficacy was statistically significantly positively related to the perception of opportunities to acquire professional competence during their studies. In addition, there were statistically and practically significant differences in the perceived teacher self-efficacy between students aspiring to careers as mathematics teachers and students aspiring to careers unrelated to teaching. The former rated their teacher self-efficacy higher on average. In response to the findings, the authors of the paper make suggestions for increasing the prospective teachers' self-efficacy and improving the quality of teacher education.

1 Uvod

Kanadski psiholog Albert Bandura je v okviru svoje socialno kognitivne teorije (Bandura, 1986) razvil teorijo o *samoučinkovitosti* (angl. *self-efficacy*) (Bandura, 1977, 1997). Samoučinkovitost je opredelil kot "prepričanje v lastne zmožnosti za organizacijo in izvršitev dejanj, ki so potrebna za dosego cilja" (Bandura, 1997, str. 3). Osrednjo pozornost je namenil posameznikovim prepričanjem o lastnih zmožnostih in vplivom, ki jih imajo ta prepričanja na posameznikovo delovanje. Avtor je predpostavljal, da samoučinkovitost pomembno vpliva na posameznikovo vedenje, saj za uspešno delo-

vanje posameznik poleg zmožnosti potrebuje tudi prepričanje, da bo znal te zmožnosti uporabiti. Tako denimo za določeno področje zmožnosti (npr. poučevanje algebrskih izrazov) razlikuje med posamezniki z nizko in visoko stopnjo samoučinkovitosti. Za prve pravi, da se izogibajo zahtevnim nalogam s tega področja, ko naletijo na ovire, se težje motivirajo za vztrajanje, so manj predani izbranim ciljem in svoje neuspehe enačijo z netalentiranostjo. Nasprotno pa pravi, da je za posameznike z visoko stopnjo samoučinkovitosti značilno, da se spoprijemajo s težkimi nalogami, ki jih dojemajo kot izziv, zadajajo si zahtevne cilje, ki so jim zelo predani, vzroke za neuspehe pa pripisujejo neučinkovitemu trudu (Bandura, 1997). Avtor je opozoril, da samoučinkovitosti ne smemo enačiti z dejanskimi zmožnostmi, saj gre zgolj za prepričanja, kaj bi lahko posameznik v specifičnih okoliščinah z zaznanimi zmožnostmi naredil, kar pa seveda vpliva na njegovo delovanje. Ob tem je poudaril, da samoučinkovitost ni nedejaven napovedovalec prihodnjih dejanj, saj bi s tem zanemarili aktivno vlogo posameznika. Na pomembnost le-te je opozoril že z vpeljavo pojma *recipročni determinizem*, s katerim je predstavil tri dejavnike, ki medsebojno vplivajo na človekov razvoj: okolje, vedenje in osebni dejavniki (Bandura, 1997).

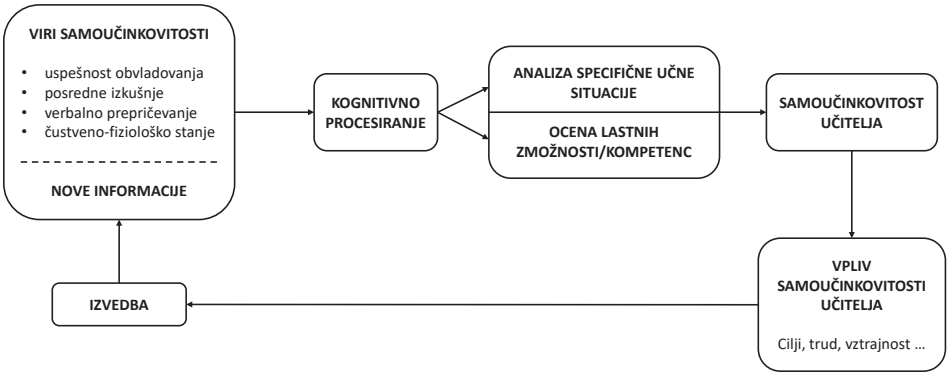
Prepričanja o samoučinkovitosti se oblikujejo na podlagi štirih glavnih virov informacij: uspešno obvladovanje specifične situacije, nadomestne izkušnje, verbalno prepričevanje in čustveno-fiziološko stanje. Najvplivnejši vir naj bi predstavljalo obvladovanje specifične situacije, saj posamezniku na najbolj avtentičen način pokaže, ali je zmožen opraviti določeno dejavnost. Uspešno obvladovanje oz. uspešno spoprijemanje z določeno nalogo naj bi krepilo posameznikovo prepričanje v lastne zmožnosti, nasprotno pa naj bi neuspešno obvladovanje to prepričanje ošibilo (Bandura, 1997).

Kot *samoučinkovitost učitelja* (angl. *teacher self-efficacy*) je pojmovano učiteljevo prepričanje v lastne zmožnosti, da zmore organizirati in izvesti dejanja, ki so potrebna za uspešno izvršitev specifične učne situacije v danem kontekstu (Tschannen-Moran idr., 1998). Učitelji pri svojem poklicu opravljajo številne raznolike dejavnosti, kar pomeni, da je samoučinkovitost učitelja večdimenzionalne in kompleksne narave (Hickman in Sherman, 2019). Zaradi tega jo je smotrno proučevati na ožjih področjih učiteljevega strokovnega delovanja (Bandura, 1997; Chesnut in Burley, 2015), kot to denimo predvideva vprašalnik *Teachers' Sense of Efficacy Scale* (Tschannen-Moran in Hoy, 2001), kjer je samoučinkovitost učitelja merjena na področju spodbujanja učencev k sodelovanju, poučevanja in vodenja razreda. Kot je že bilo izpostavljeno, Bandura (1997) v svoji teoriji poudarja pomembno vlogo samoučinkovitosti pri delovanju posameznika, kar pomeni, da ima tudi samoučinkovitost učitelja pomemben vpliv na učiteljevo delovanje. To prikažejo Tschannen-Moran idr. (1998), ko s krožnim modelom (slika 1) umestijo samoučinkovitost učitelja v kontekst njegovega delovanja. Kot opisuje Bandura (1997), je samoučinkovitost odvisna od specifične situacije, v kateri se posameznik nahaja, zato na samoučinkovitost učitelja v danem trenutku poleg ocene lastnih zmožnosti vpliva tudi analiza specifične učne situacije. Zaznava samoučinkovitosti učitelja za poučevanje algebrskih izrazov je tako denimo lahko odvisna od razreda, v katerem jo poučuje (npr. v razredu, ki mu je razrednik, ali v razredu, kjer prvič izvaja nadomeščanje). Zaznana samoučinkovitost v danem trenutku vpliva na delovanje učitelja (na zadane cilje, vložen trud, vztrajnost …), kar se kaže v izvedbi. Uspešnost oz. neuspešnost izvedbe ima vlogo vira informacij za nadaljnje ocene samoučinkovitosti, kjer jim je preko kognitivnega procesiranja v novi učni situaciji dodeljena teža in vpliv

na novo analizo učne situacije in novo oceno lastnih zmožnosti (Tschannen-Moran idr., 1998; Woolfolk Hoy in Heater, 2006).

Slika 1

Krožni model samoučinkovitosti učitelja (Tschannen-Moran idr., 1998)



Bandura (1977, 1997) je v svoji teoriji poudaril, da so prepričanja o lastnih zmožnostih s specifičnega področja še posebej dovzetna za spremembe, ko je posameznik v procesu pridobivanja znanj in zmožnosti s tega področja, kar za samoučinkovitost učitelja pomeni, da je nanjo najlažje vplivati, ko je učitelj še v procesu izobraževanja (Hickman in Sherman, 2019).

Prve meritve samoučinkovitosti učitelja segajo v pozna 70. leta (Zee in Koomen, 2016), do danes pa so pojem proučevali na različne načine in v povezavi s številnimi spremenljivkami. Tako so denimo Fives idr. (2007) proučevali samoučinkovitost bodočih ameriških učiteljev, ki so svoje pripravništvo opravljali v institucijah, primerljivih s slovenskim osnovnošolskim izobraževanjem (ISCED 1–2), pri čemer so ugotovili, da sta raven samoučinkovitosti in izgorelost učiteljev negativno povezani. Zato so predlagali, da bi lahko s krepitvijo učiteljske samoučinkovitosti omilili občutek izgorelosti. Zee in Koomen (2016) sta v svoji metaraziskavi poročala, da samoučinkovitost na področju poučevanja in spodbujanja učencev k sodelovanju napoveduje osebno zadovoljstvo. Avtorici Bruinsma in Jansen (2010) sta proučevali samoučinkovitost bodočih učiteljev na Nizozemskem in ugotovili, da je njihova ocena samoučinkovitosti pozitivno povezana z zaznano kakovostjo študijskega programa ter z izkušnjami, pridobljenimi med praktičnim usposabljanjem. Nadalje sta ugotovili, da bodoči učitelji z višjo oceno samoučinkovitosti nameravajo ostati v učiteljskem poklicu dlje časa kot pa tisti z nižjo oceno. Pomen učiteljeve samoučinkovitosti pri poklicnem odločanju sta za bodoče učitelje in učitelje v praksi v metaanalizi potrdila tudi Chesnut in Burley (2015), ko sta pokazala, da je ocena samoučinkovitosti učitelja pozitivno povezana s predanostjo učiteljskemu poklicu. V našem prostoru sta avtorici Dolenc in Virag (2018, str. 79), sicer na vzorcu pedagoških delavcev, ugotovili, da se "zadovoljstvo pri delu […] pozitivno povezuje s samoučinkovitostjo".

2 Problem raziskave, cilji in raziskovalna vprašanja

Predstavljena teorija o samoučinkovitosti in empirični izsledki nakazujejo, da ima samoučinkovitost učitelja pomemben vpliv na njegovo opravljanje poklica. Na prepričanja o lastnih zmožnostih pomembno vplivajo pretekle izkušnje, ki pa si jih učitelji začnejo pridobivati že med študijem. To je obdobje, v katerem naj bi bili najdovzetnejši za spremembe svojih prepričanj (Bandura, 1997; Hickman in Sherman, 2019), zato je smiselno samoučinkovitost proučevati že pri bodočih učiteljih. V našem prostoru je moč zaslediti raziskave, ki so se ukvarjale s proučevanjem samoučinkovitosti učitelja (npr. Ažman, 2017; Gotal, 2019; Horvat, 2016; Japelj Pavešić idr., 2019; Kuronja, 2018; Marn, 2014; Pulec Lah, 2013; Trstenjak, 2016; Žagar Rupar, 2018), ni pa bilo moč zaslediti nobene, ki bi jo merila pri študentih – bodočih učiteljih. Ker je samoučinkovitost učitelja smiselno meriti na ožjih področjih učiteljevega delovanja (Bandura, 1997; Chesnut in Burley, 2015) in ker je poučevanje matematike zahtevna dejavnost (Langoban, 2020), smo se v naši raziskavi usmerili na proučevanje samoučinkovitosti študentov – bodočih učiteljev matematike.

Cilj raziskave je bil proučiti zaznavo učiteljske samoučinkovitosti pri bodočih učiteljih matematike in preveriti odnos med samoučinkovitostjo ter zaznanimi priložnostmi za usvajanje strokovnih kompetenc, ki so jih študenti imeli oz. jih imajo v okviru študija. Zanimal nas je tudi odnos med samoučinkovitostjo in namero študentov o nadaljnji poklicni karieri. Zastavili smo si naslednja raziskovalna vprašanja:

- Kakšna je zaznava samoučinkovitosti bodočih učiteljev matematike?
- Kakšen je odnos med zaznano samoučinkovitostjo bodočih učiteljev matematike in priložnostmi za usvajanje strokovnih kompetenc v okviru študija?
- Kakšen je odnos med zaznano samoučinkovitostjo bodočih učiteljev in njihovo namero o nadaljnji poklicni karieri?

3 Raziskovalna metoda

Predstavljena raziskava je del širše raziskave (Zupančič, 2021). Temeljila je na kvantitativnem raziskovalnem pristopu, metoda je bila kavzalna neeksperimentalna.

Udeleženci

Zaradi omejene dostopnosti v času pandemije covida-19 smo izbrali priložnostno vzorčenje. V raziskavi je sodelovalo 83 bodočih učiteljev matematike Pedagoške fakultete Univerze v Ljubljani (64 % vpisanih študentov), ki so bili maja 2021 vpisani v 2., 3. ali 4. letnik univerzitetnega študijskega programa prve stopnje Dvopredmetni učitelj, smer matematika, ali v 1. letnik drugostopenjskega magistrskega študijskega programa Poučevanje, smer predmetno poučevanje z vezavo matematika. Iz vsakega letnika je v raziskavi sodelovala vsaj polovica vpisanih študentk in vsaj polovica vpisanih študentov.

Instrument

Za namen raziskave je bil pripravljen tridelni vprašalnik. S prvim delom so bili zbrani demografski podatki o sodelujočih, z drugim delom je bila izmerjena zaznava samou-

činkovitosti bodočih učiteljev matematike, s tretjim pa zaznava priložnosti za usvajanje kompetenc v okviru študija. Ocena samoučinkovitosti je bila izmerjena z validiranim vprašalnikom za merjenje samoučinkovitosti učiteljev: *Teachers' Sense of Efficacy Scale* (v nadaljevanju TSES) (Tschannen-Moran in Hoy, 2001). Uporabljena je bila krajša različica instrumenta z 12 trditvami, kjer so sodelujoči moč prepričanja v lastne zmožnosti, tako kot v izvorni različici, ocenili na 9-stopenjski lestvici (1 – nič, 3 – zelo majhna, 5 – srednja, 7 – velika in 9 – zelo velika). Trditve merijo samoučinkovitost učitelja na treh vsebinskih področjih (štiri trditve za vsako področje): spodbujanje učencev k sodelovanju, poučevanje in vodenje razreda. Konstruktna veljavnost tega dela instrumenta je bila preverjena z eksplorativno faktorsko analizo po metodi neuteženih najmanjših kvadratov. Kaiser-Mayer-Olkinova mera primernosti vzorca (KMO = 0,836) in Barlettov preizkus sferičnosti (X^2 = 358,799; p = 0,001) sta potrdila primernost vzorca za izvedbo faktorske analize, kjer pa se je pokazal le en faktor (λ = 4,806), ki pojasnjuje 40,05 % variance. Avtorici instrumenta sta strukturo s tremi faktorji ugotovili pri učiteljih v praksi (takšna struktura je pojasnila 65 % variance), pri bodočih učiteljih pa sta tudi sami ugotovili, da lahko govorimo o strukturi le z enim faktorjem (Tschannen-Moran in Hoy, 2001). Zanesljivost uporabljenega vprašalnika TSES smo potrdili s Chronbach koeficientom alpha (α = 0,86). Tretji del vprašalnika so sestavljale vsebinsko enake trditve kot v drugem delu, le da so sodelujoči ocenili, koliko priložnosti so imeli, da so naslovljene kompetence usvojili v okviru študija. Tudi v tem delu so oceno podali na 9-stopenjski lestvici, zanesljivost je bila ustrezna (α = 0,93). Z uporabo 9-stopenjske lestvice je bila zagotovljena večja občutljivost instrumenta, vsa vprašanja pa so bila zaprtega tipa, s čimer je bila zagotovljena objektivnost vrednotenja odgovorov.

Zbiranje in obdelava podatkov

Vprašalnik je bil pripravljen v spletni obliki in sodelujočim posredovan na študijske elektronske naslove, v spletne učilnice predmetov iz didaktike matematike in preko predstavnikov posameznih letnikov. Podatke smo zbirali 14 dni, začenši 18. 5. 2021, nato so bili izvoženi in urejeni v programu Microsoft Office Excel, obdelani pa v programu IBM SPSS Statistics 21. Najprej je bila izvedena opisna statistična analiza, s katero so bile izračunane absolutne (f) in relativne frekvence (f%), aritmetične sredine (M) in standardni odkloni (SD). Na podlagi rezultatov Kolmogorov-Smirnov testa sta bila v nadaljevanju obdelave podatkov izbrana parametrična preizkusa: Pearsonov koeficient korelacije in enosmerna analiza variance (ANOVA). Z delnim eta kvadratom je bila izračunana velikost učinka. Zbiranje, obdelavo in interpretacijo podatkov smo izvedli v skladu s temeljnimi etičnimi načeli pedagoškega raziskovanja (sodelujoči so bili seznanjeni, da je sodelovanje v raziskavi prostovoljno in da lahko iz nje na katerikoli stopnji izstopijo, zagotovljena jim je bila anonimnost).

4 Rezultati

Rezultati so predstavljeni v vsebinskih sklopih glede na zastavljena raziskovalna vprašanja.

Zaznana samoučinkovitost bodočih učiteljev matematike

V tabeli 1 je prikazana povprečna ocena zaznane samoučinkovitosti vseh sodelujočih, ki je glede na definirano deskriptivno lestvico (razdelek 3.2) srednja do velika.

Tabela 1

Povprečna ocena samoučinkovitosti vseh sodelujočih študentov (N = 83)

	Najnižja vrednost	*Najvišja vrednost*	*M*	*SD*
Samoučinkovitost učitelja	3,83	8,25	6,16	0,95

Čeprav v Sloveniji in v tujini nismo zasledili raziskave, ki bi bila glede na zajeti vzorec (bodoči učitelji matematike) in uporabljeni instrument (krajša različica instrumenta TSES) primerljiva naši, pa lahko rezultate vsaj informativno primerjamo z raziskavo avtorjev Temiz in Topcu (2013), kjer je bila z daljšo različico instrumenta TSES merjena samoučinkovitost bodočih predmetnih učiteljev matematike in naravoslovnih predmetov v Turčiji. V omenjeni raziskavi so sodelujoči v povprečju izrazili visoko stopnjo samoučinkovitosti (M = 7,10, SD = 0,92), ki je nekoliko višja kot v pričujoči raziskavi.

V tabeli 2 so predstavljene povprečne ocene samoučinkovitosti vseh sodelujočih pri posameznih trditvah. Iz rezultatov lahko ugotovimo, da so sodelujoči pri 3. trditvi svojo samoučinkovitost v povprečju ocenili z najvišjo vrednostjo, pri 11. trditvi pa z najnižjo.

Tabela 2

Povprečna ocena samoučinkovitosti vseh sodelujočih pri posameznih trditvah (N = 83)

Trditev		*M*	*SD*
3	Krepitev zaupanja učencem, da so lahko uspešni pri matematiki.	7,03	1,33
10	Zagotavljanje alternativne (drugačne) razlage/primerov pri pouku matematike, ko učenci česa ne razumejo.	6,61	1,35
6	Zagotavljanje upoštevanja razrednih pravil s strani učencev.	6,47	1,34
5	Oblikovanje ustreznih vprašanj pri pouku matematike.	6,41	1,38
4	Pojasnjevanje pomena učenja matematike učencem.	6,35	1,49
9	Uporaba različnih načinov ocenjevanja pri pouku matematike.	6,23	1,71
1	Nadzor motečega vedenja v razredu.	6,18	1,52
7	Pomiritev učencev, ki so moteči ali glasni.	5,99	1,57
8	Vzpostavljanje sistema vodenja v razredu glede na različne skupine učencev.	5,83	1,60
12	Uporaba alternativnih strategij oz. novih učnih pristopov poučevanja pri pouku matematike.	5,81	1,73
2	Motiviranje učencev, ki pri pouku matematike ne kažejo velikega interesa za delo.	5,67	1,45
11	Usmerjanje staršev, kako lahko pripomorejo k dobremu uspehu svojega otroka pri matematiki.	5,30	1,68

V Sloveniji smo zasledili še tri raziskave, ki so merile samoučinkovitost učitelja z vprašalnikom TSES, in sicer avtorjev Pulec Lah (2013), Horvat (2016) in Kuronja (2018). Čeprav so raziskave merile samoučinkovitost učiteljev pri delu z učenci z motnjo pozornosti in hiperaktivnosti (Pulec Lah, 2013), učnimi težavami (Horvat, 2016) in učenci z učnimi, čustvenimi in vedenjskimi težavami (Kuronja, 2018), je zanimivo, da je bila v povprečju najnižja ocena samoučinkovitosti v vseh treh, tako kot tudi pri naši raziskavi, izmerjena pri trditvi, ki se nanaša na zmožnosti usmerjanja staršev.

Ocena priložnosti za usvajanje strokovnih kompetenc v okviru študija

Iz tretjega dela vprašalnika je bila pridobljena povprečna ocena priložnosti usvajanja strokovnih kompetenc v okviru študija od vseh sodelujočih, ki je srednje velika (M = 4,95, SD = 1,48 [1,50–8,50]).

Iz tabele 3 lahko opazimo, da se štiri najvišje ocenjene trditve nanašajo na vsebinsko področje poučevanja matematike. Za te so bodoči učitelji v povprečju ocenili, da imajo srednje veliko do veliko priložnosti usvajanja strokovnih kompetenc s tega področja. Dodatno pa lahko ugotovimo, da se dve v povprečju najnižje ocenjeni trditvi nanašata na vsebinsko področje vodenja razreda, specifično ti dve trditvi izražata zmožnosti s področja nadzorovanja in pomirjanja motečih učencev. Za usvajanje slednjih dveh strokovnih kompetenc so sodelujoči v povprečju ocenili, da so imeli zelo malo do srednje veliko priložnosti pridobivanja le-teh.

Tabela 3

Povprečna ocena priložnosti usvajanja strokovnih kompetenc vseh sodelujočih v okviru študija pri posameznih trditvah (N = 83)

Trditev		*M*	*SD*
5	Oblikovanje ustreznih vprašanj pri pouku matematike.	6,23	1,72
9	Uporabe različnih načinov ocenjevanja pri pouku matematike.	6,18	2,07
10	Zagotavljanje alternativne (drugačne) razlage/primerov pri pouku matematike, ko učenci česa ne razumejo.	6,13	1,88
12	Uporaba alternativnih strategij oz. novih učnih pristopov poučevanja pri pouku matematike.	6,07	1,86
4	Pojasnjevanje pomena učenja matematike učencem.	5,17	1,98
3	Krepitev zaupanja učencev, da so lahko uspešni pri matematiki.	5,01	1,88
8	Vzpostavljanje sistema vodenja v razredu glede na različne skupine učencev.	4,95	2,00
2	Motiviranje učencev, ki pri pouku matematike ne kažejo velikega interesa za delo.	4,93	2,03
6	Zagotavljanje upoštevanja razrednih pravil s strani učencev.	3,92	2,17
11	Usmerjanje staršev, kako lahko pripomorejo k dobremu uspehu svojega otroka pri matematiki.	3,70	1,97
1	Nadzor motečega vedenja v razredu.	3,65	2,00
7	Pomirjanje učencev, ki so moteči ali glasni.	3,48	1,90

Rezultati so pokazali, da sta ocena samoučinkovitosti in ocena priložnosti usvajanja strokovnih kompetenc v okviru študija statistično značilno pozitivno povezani (r = 0,30, p = 0,005). Povezanost je šibka. Podatke lahko posplošimo na osnovno množico in s tveganjem 0,5 % trdimo, da bi bodoči učitelji matematike v osnovni množici z višjo oceno samoučinkovitosti tudi višje ocenili priložnost usvajanja strokovnih kompetenc v okviru študija. Dobljene rezultate lahko primerjamo z rezultati raziskave avtoric Bruinsma in Jansen (2010), kjer sta ugotovili, da je samoučinkovitost učitelja pozitivno povezana z zaznano kakovostjo učiteljskega izobraževalnega programa in zaznano kakovostjo izkušenj v času pripravništva.

Namera o izbiri poklicne kariere

Sodelujoči so se pri enem izmed vprašanj opredelili, v katerem poklicu se želijo zaposliti: poklicu, povezanem s poučevanjem matematike, poklicu, povezanem s poučevanjem, vendar ne matematike, ali v poklicu, ki ni povezan s poučevanjem.

Ob upoštevanju predpostavke o homogenosti varianc je enosmerna analiza variance (ANOVA) med bodočimi učitelji matematike glede na nameravano poklicno kariero pokazala statistično značilne razlike v njihovi oceni samoučinkovitosti (tabela 4).

Tabela 4

Samoučinkovitost in nameravana poklicna kariera – deskriptivna statistika in homogenost varianc

	Poklic	*n*	*M*	*SD*	*Homogenost varianc*			
					F	g_1	g_2	*p*
S*	Povezan s poučevanjem matematike	68	6,28	0,86	2,95	2	80	0,06
	Povezan s poučevanjem, vendar ne matematike	7	5,87	1,01				
	Ni povezan s poučevanjem	8	5,40	1,33				

Opomba: * Samoučinkovitost učitelja

Tabela 5

Razlike v samoučinkovitosti glede na nameravano poklicno kariero

ANOVA			*Post hoc test – Tukey HSD*			*Delni eta kvadrat*
F	*g*	*p*	*(I) poklic*	*(J) poklic*	*p*	η_p^2
3,66	2	0,03	Povezan s poučevanjem matematike	Povezan s poučevanjem, vendar ne matematike	0,51	0,08
				Ni povezan s poučevanjem	0,03	
			Povezan s poučevanjem, vendar ne matematike	Povezan s poučevanjem matematike	0,51	
				Ni povezan s poučevanjem	0,58	

Tukey HSD – post hoc test je pokazal statistično značilne razlike med študenti, ki se nameravajo zaposliti v poklicu, ki je povezan s poučevanjem matematike, in tistimi, ki se nameravajo zaposliti v poklicu, ki ni povezan s poučevanjem (tabela 5). Post hoc test med ostalimi podskupinami ni pokazal statistično značilnih razlik. S tveganjem 3 % trdimo, da bi tudi v osnovni množici študentje, ki se nameravajo zaposliti v poklicu, ki je povezan s poučevanjem matematike, svojo samoučinkovitost v povprečju ocenili višje kot študentje, ki se ne nameravajo zaposliti v pedagoškem poklicu. Velikost učinka je srednja, kar pomeni, da se med bodočimi učitelji matematike glede na nameravano poklicno kariero pojavljajo praktično značilne razlike v njihovi oceni samoučinkovitosti.

Ugotovitev sovpada z rezultati avtorjev Bruinsma in Jansen (2010) ter Chesnut in Burley (2015), ki so ugotovili, da je samoučinkovitost bodočih učiteljev pomemben dejavnik, ko se le-ti odločajo za vstop v učiteljski poklic in to, ali bodo v njem ostali.

5 Sklep

Raziskavo smo izvedli z namenom, da bi pridobili informacijo o tem, kako svojo samoučinkovitost zaznavajo bodoči učitelji matematike v slovenskem vzgojno-izobraževalnem prostoru, in preverili, v kakšnem odnosu je le-ta z zaznano priložnostjo usvajanja strokovnih kompetenc v okviru študija ter namero o nadaljnji poklicni karieri. Rezultati so pokazali, da se sodelujoči študentje zaznavajo kot srednje visoko do visoko samoučinkovite, pri čemer so bili v povprečju najbolj prepričani v svoje zmožnosti, da bodo znali učencem krepiti zaupanje, da so le-ti lahko uspešni pri matematiki, najmanj pa v svoje zmožnosti za usmerjanje staršev, kako lahko le-ti pripomorejo k dobremu uspehu svojega otroka pri matematiki. Prepričanje v zmožnosti za usmerjanje staršev se je tudi v drugih sorodnih slovenskih raziskavah (Pulec Lah, 2013; Hrovat, 2016; Kuronja, 2018) izkazalo za najnižje ocenjeno prepričanje pri merjenju samoučinkovitosti različnih slovenskih učiteljev. V Sloveniji torej tako učitelji kot tudi bodoči učitelji izražajo nizko stopnjo prepričanja v lastne zmožnosti za usmerjanje staršev, kar nakazuje na potrebo za prihodnje naslavljanje te problematike, tudi zato, ker imajo starši pomembno vlogo pri motiviranju učencev in razvijanju njihovega odnosa do učenja (Blažič idr., 2003). Ta vloga je zlasti pomembna v "obdobju osnovnošolskega izobraževanja, kjer se praktična uporabnost naučenega v šoli kaže predvsem v vsakodnevnih življenjskih izkušnjah" (Berčnik in Devjak, 2018, str. 73). Ob tem pa bi bilo zmotno sklepati, da učiteljevo sodelovanje s starši zmanjšuje učiteljevo strokovno avtonomijo, saj se ta kaže tudi v tem, da "znajo vključiti predloge staršev, kadar so smiselni, in jih strokovno argumentirano "izključiti", kadar niso" (Berčnik in Devjak, 2017, str. 77).

V rezultatih se je pokazala tudi pozitivna povezanost med zaznano samoučinkovitostjo bodočih učiteljev matematike in njihovo zaznano priložnostjo usvajanja strokovnih kompetenc v okviru študija, kar se ujema z ugotovitvami avtoric Bruinsma in Jansen (2010). V naši raziskavi so študentje v povprečju ocenili, da so imeli srednje veliko možnost usvajanja navedenih strokovnih kompetenc, pri čemer so v povprečju ocenili, da imajo najboljše priložnosti usvajanja strokovnih kompetenc na področju poučevanja matematike, najslabše pa na področju nadzorovanja in pomirjanja motečih učencev. Nazadnje smo ugotovili, da se med bodočimi učitelji matematike, ki se nameravajo za-

posliti v poklicu, povezanem s poučevanjem matematike, in tistimi, ki se ne nameravajo zaposliti v pedagoškem poklicu, pojavljajo tako statistične kot tudi praktično značilne razlike, pri čemer so slednji v povprečju svojo samoučinkovitost ocenili nižje.

Pridobljeni rezultati raziskave so pomembni, saj nakazujejo na nekatere potrebe bodočih učiteljev matematike, ki še niso bile izpolnjene. Priložnost vidimo v izpopolnjevanju študijskih programov, v katere bi bilo smiselno na premišljen način vključiti vsebinska področja, za katera so bodoči učitelji izrazili, da imajo slabše prepričanje v lastne zmožnosti ali da so do sedaj imeli slabše priložnosti usvajanja teh strokovnih kompetenc. Tako bi se lahko denimo študentje spoznali z "načini učiteljevega odzivanja na neprimerno vedenje" (Kozmus 2016, str. 101), tudi zato, ker se "učiteljev način vodenja razreda in komunikacije z učenci ter učne oblike in metode poučevanja matematike […] kažejo kot pomembni dejavniki, ki vplivajo na razvoj doživljanja matematične anksioznosti" (Puklek Levpušček, 2014, str. 50). Glede na pridobljene rezultate smo oblikovali sledeče predloge za krepitev samoučinkovitosti in na splošno za izboljšanje kakovosti izobraževanja bodočih učiteljev:

- Iz rezultatov je razvidno, da bi študentje potrebovali več pedagoško-psiholoških znanj v povezavi z vodenjem in motiviranjem učencev ter o sodelovanju s starši. Tem vsebinam bi bilo potrebno nameniti posebno pozornost, tako v okviru splošno pedagoških predmetov kot tudi specialno didaktičnih.
- Ko bodoči učitelji matematike Pedagoške fakultete Univerze v Ljubljani zaključijo petletni študij (4 + 1), izvedejo v okviru študija dva tedna pedagoške prakse za matematično predmetno področje (in dva tedna za drugi predmet njihove vezave) ter opravijo enega, največ pa dva nastopa pri pouku matematike. Študentom bi bilo potrebno omogočiti več priložnosti za praktično usposabljanje, da si lahko v avtentičnem delovnem okolju pridobijo in okrepijo strokovne kompetence.
- Poleg neposrednih izkušenj, ki si jih bodoči učitelji pridobijo v času pedagoške prakse in nastopov, so pomemben vir samoučinkovitosti tudi posredne izkušnje, ki si jih študentje lahko pridobijo z opazovanjem drugih. Čeprav si takšne izkušnje študentje že sedaj pridobivajo z opazovanjem izkušenih učiteljev in svojih sošolcev, ko hospitirajo pri njihovem pouku, menimo, da bi bilo smiselno število teh še zlasti v začetnih letnikih študija povečati. Takšna opazovanja študentom omogočajo, da na zelo pristne načine izkusijo dinamiko pouka, obenem pa so zaradi dodeljene vloge opazovalca lahko pozorni na elemente, ki jih kot učitelji začetniki morda nikoli ne bi opazili. Po drugi strani pa bi posredne izkušnje učitelji lahko pridobili tudi z videoanalizami že posnetih učnih ur. Takšen način pridobivanja posrednih izkušenj, v primerjavi z organizacijo hospitacij, ni zahtevno omogočiti, obenem pa je zaradi možnega večkratnega ogleda posnetkov študentom omogočen podrobnejši pogled v dogajanje in zato tudi omogočena temeljitejša analiza učnih ur. Dodatno lahko na tak način, s primerno izbranimi videoposnetki, študentom omogočimo usmerjeno in poglobljeno pridobivanje posrednih izkušenj na posameznih specifičnih področjih, kot je denimo spoprijemanje z vzgojno problematiko ali krepitev zaupanja učencev v njihove matematične zmožnosti.
- Ne glede na način pridobivanja strokovnih kompetenc pa želimo poudariti, da imata pri vsem tem pomembno vlogo pogovor in analiza z mentorji na šolah oz. izvajalci študijskega programa, kjer imajo bodoči učitelji priložnost evalvirati doživeto, zastaviti morebitna vprašanja in prejeti povratno informacijo. Ocenjujemo, da je posebno pozornost pri slednjih pogovorih smotrno nameniti področjem, na katerih

so sodelujoči izrazili nižjo stopnjo samoučinkovitosti (usmerjanje staršev, motiviranje učencev, uporaba alternativnih strategij poučevanja). Pri takšnih interakcijah pa ne gre pozabiti na verbalne spodbude, s katerimi lahko pripomoremo h krepitvi prepričanj študentov, da bodo ne glede na morebitne trenutne neuspehe ali negativne občutke znali pridobljene zmožnosti pri svojem delu s pridom uporabiti.

S prispevkom smo želeli osvetliti pomen proučevanja samoučinkovitosti (bodočih) učiteljev, saj tako teoretični kot tudi empirični izsledki kažejo, da ima le-ta pomembno vlogo pri sami organizaciji in izvedbi pouka oz. kakovosti vzgojno-izobraževalnega procesa (Tschannen-Moran idr., 1998; Woolfolk Hoy in Heater, 2006), pri učiteljevi dobrobiti (Fives idr., 2007; Zee in Koomen, 2016) ter pri odločitvi za delo v učiteljskem poklicu (Bruinsma in Jansen, 2010; Chesnut in Burley, 2015). Menimo, da je predanost (bodočih) učiteljev lastnemu poklicu danes še posebej aktualna tematika, saj se slovensko šolstvo sooča s kadrovsko problematiko, ki lahko v prihodnosti pomembno vpliva na kakovost izvedbe učnega procesa in posledično na samo znanje učencev.

Omejitve

Zbiranje podatkov je potekalo v obdobju pandemije covida-19, zaradi česar je študijski proces potekal v drugačnih okoliščinah in s tem tudi pridobivanje teoretičnih znanj ter praktičnih izkušenj. Slednje je lahko pomembno vplivalo na pridobljene rezultate, saj smo med drugim študente povprašali o njihovi oceni priložnosti za usvajanje strokovnih kompetenc, te priložnosti pa so bile zaradi nastale situacije drugačne kot v letih poprej. Omenjene specifične okoliščine so zato lahko vplivale tudi na zaznavo samoučinkovitosti bodočih učiteljev in njihovo namero o izbiri poklicne kariere. Dodatno bi izpostavili, da nismo opravili dvojnega prevajanja instrumenta in pilotne raziskave, s čimer bi lahko izboljšali merske karakteristike instrumenta.

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Teacher Self-Efficacy of Prospective Mathematics Teachers, Professional Competence and Career Choice

Albert Bandura developed the theory of self-efficacy (Bandura, 1977, 1997) as part of his social cognitive theory (Bandura, 1986). He defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). He emphasized the importance of self-efficacy beliefs for people's actions because he believed that for an action to be successful, each individual needs both skills and the belief that he or she has the necessary skills to perform such an action. For a given set of abilities, he distinguished between people with high and low self-efficacy in that area. He characterized people with low self-efficacy in a particular domain as those who avoid challenging tasks, are harder to motivate when faced with obstacles, are less committed to their goals, and tend to view their failure as a lack of talent. In contrast, people with high self-efficacy in a particular domain cope with difficult tasks that they find challenging, set challenging goals to which they are highly committed, and attribute failures to ineffective efforts (Bandura, 1997). Bandura

(1997) theorized that self-efficacy beliefs are formed based on four main sources: enactive mastery experience, vicarious experience, verbal persuasion, and physiological and affective states. He described the first source as the most influential because a person receives the most authentic feedback about his or her ability to cope with a given situation. Normally, successful mastery of a particular task strengthens self-efficacy beliefs and, conversely, unsuccessful mastery weakens them (Bandura, 1997).

Teacher self-efficacy refers to teachers' beliefs that they are capable of organizing and performing the actions necessary to successfully carry out a particular learning situation in a particular context (Tschannen-Moran et al., 1998). Teachers perform a variety of activities in their profession, which means that teacher self-efficacy is multidimensional and complex (Hickman and Sherman, 2019). For this reason, it is useful to examine it in the narrower domains of professional activity (Bandura, 1997; Chesnut and Burley, 2015), e.g., with the Teachers' Sense of Efficacy Scale (Tschannen-Moran and Hoy, 2001), which measures teacher self-efficacy in the areas of student engagement, instructional strategies, and classroom management. Bandura (1977, 1997) theorized that beliefs about one's abilities in a particular domain are particularly susceptible to change when one is in the process of acquiring knowledge and skills in that domain, implying that teacher self-efficacy is most easily influenced when teachers are still in training (Hickman and Sherman, 2019).

The first research in the area of teacher self-efficacy was conducted in the late 1970s (Zee and Koomen, 2016), and to date it has been studied in different ways and in relation to many different variables. Fives et al. (2007) found a negative relationship between teacher self-efficacy and burnout in prospective American teachers. Brunisma and Jansen (2010) reported that the measured teacher self-efficacy of prospective Dutch teachers was positively related to the perceived quality of the education programme and that prospective teachers with higher teacher self-efficacy intended to stay in the teaching profession longer than those with lower scores. The importance of teacher self-efficacy for the career decisions of prospective and in-service teachers was also confirmed in a meta-analysis by Chesnut and Burley (2015), which showed that teacher self-efficacy scores were positively related to commitment to the teaching profession.

Self-efficacy theory and empirical findings indicate that teacher self-efficacy has a significant impact on teacher performance. Belief in one's own abilities is significantly influenced by the teachers' prior experiences while still at university. This is the period when their beliefs are most likely to change (Bandura, 1997; Hickman and Sherman, 2019). Therefore, it is useful to study the teacher self-efficacy of prospective teachers. Although certain Slovenian studies have examined teacher self-efficacy (e.g., Ažman, 2017; Gotal, 2019; Horvat, 2016; Japelj Pavešić et al., 2019, Kuronja, 2018; Marn, 2014; Pulec Lah, 2013; Trstenjak, 2016; Žagar Rupar, 2018), it was not possible to find studies that measured prospective teacher self-efficacy. Because teacher self-efficacy can be meaningfully measured in the narrower domains of teacher performance (Bandura, 1997; Chesnut and Burley, 2015) and mathematics teaching is a demanding activity (Langoban, 2020), our study focused on examining prospective mathematics teachers' self-efficacy.

The purpose of this study was to examine the teacher self-efficacy of prospective mathematics teachers and its relationship to students' perceptions of opportunities to acquire professional skills during their studies and to their intentions to pursue a professional career. The quantitative survey was conducted among 83 (64 % of enrolled) pro-

spective mathematics teachers at the Faculty of Education of the University of Ljubljana in the 2020/21 academic year. The prospective teachers completed an online questionnaire consisting of three parts. The first part collected demographic data, the second part included a short version (12 statements) of the Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran, as cited in Hoy, 2001), and the third part captured the perceived opportunities to acquire professional competence (12 statements). The participants expressed their beliefs about their teacher competence and perceived opportunities on a 9-point scale (1 – none, 3 – very low, 5 – medium, 7 – high, and 9 – very high).

The data collected showed that, on average, the participants exhibited moderate to high self-efficacy (M = 6.16, SD = 0.95), with the highest self-efficacy exhibited in the third statement (M = 7.03, SD = 1.33), which related to the ability to boost students' confidence to succeed in mathematics, and the lowest in the eleventh statement (M = 5.30, SD = 1.68), which referred to the ability to help families to ensure that their children do well in mathematics. In Slovenia, we found three other studies that measured teacher self-efficacy using the TSES questionnaire, namely Pulec Lah (2013), Hrovat (2016), and Kuronja (2018). Although the studies measured teacher self-efficacy in working with students with attention deficit hyperactivity disorder (Pulec Lah, 2013), learning disabilities (Horvat, 2016), and students with learning, emotional, and behavioural difficulties (Kuronja, 2018), it is interesting to note that, as in our study, the lowest self-efficacy scores in all three studies were measured on average in supporting families.

The prospective mathematics teachers indicated that they had moderate (M = 4.95, SD = 1.48) opportunities to acquire professional competence during their studies. They indicated that they had the best opportunities to acquire competence in formulating good questions in mathematics classrooms (M = 6.23, SD = 1.72) and the worst in dealing with disruptive or noisy students (M = 3.48, SD = 1.90). The results also show a weak positive correlation between prospective mathematics teachers' perceived teacher self-efficacy and their perceived opportunities to acquire professional competence during their studies (r = 0.30, p = 0.005). This finding is consistent with Bruinsma and Jansen's (2010) study in which they found that teacher self-efficacy and perceived quality of the teaching training programme were positively correlated.

In examining the relationship between teacher self-efficacy and prospective mathematics teachers' career aspirations, we found statistical and practical differences between students aspiring to careers as mathematics teachers and students aspiring to careers unrelated to teaching. The former rated their teacher self-efficacy higher on average, which is consistent with the findings of Bruinsma and Jansen (2010) and Chesnut and Burley (2015), who reported that teacher self-efficacy is an important factor in prospective teachers' decision to enter and remain in the teaching profession.

We see great value in the results obtained as they point to some unmet needs of prospective mathematics teachers. We see an opportunity to improve the curricula that could usefully include the content areas where prospective teachers are either less confident in their own abilities (helping families to motivate students) or have had less opportunity to acquire this professional competence (controlling and calming disruptive students). Based on the findings, we have formulated the following suggestions for increasing teacher self-efficacy and improving the quality of teacher education programmes:

- *Provide more opportunities for practical training in which prospective teachers can acquire and strengthen their professional competences in an authentic work environment.*
- *Provide more opportunities for observations in mathematics classrooms where student teachers can experience the dynamics of teaching in a very authentic way and pay attention to elements that they might never have noticed. These observations can be organized in a variety of ways (e.g., traditional observation with students present in the classroom, or an analysis of videos of mathematics instruction).*
- *Recognition of the importance of feedback and verbal persuasion, through which mentors and professors can reinforce students' beliefs that they will be able to use the competence well in their classes, regardless of any current setbacks or negative feelings they are experiencing.*
- *More opportunities for students to acquire educational psychology skills related to leadership, motivation, and collaboration with parents during their studies.*

The purpose of this paper was to highlight the importance of examining (prospective) teachers' self-efficacy, as both theoretical and empirical evidence suggest that it plays an important role in the organization and delivery of teaching (Tschannen-Moran et al., 1998; Woolfolk Hoy and Heater, 2006) and in teachers' well-being (Fives et al., 2006). We believe that the commitment of (prospective) teachers to their own profession is a particularly topical issue today, as the Slovenian education system is facing staffing problems that may have a significant impact on the organization of teaching and, consequently, on the quality of students' knowledge in the future.

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Future Primary Teachers' Knowledge about the Perimeter and Area of a Rectangle

Prejeto 31. 1. 2023 / Sprejeto 16. 6. 2023

Znanstveni članek

UDK 378.091.3:514.1

KLJUČNE BESEDE: ploščina pravokotnika, obseg pravokotnika, konceptualno in proceduralno znanje, osnovnošolski učitelji, učbenik za matematiko

POVZETEK – Kakšna je kakovost matematičnega znanja naših učencev in naših študentov – bodočih učiteljev? Ali znajo to znanje uporabiti v realnih situacijah, znajo razložiti pojme in postopke ali pa samo vadijo in avtomatizirajo postopke brez razmišljanja? To so vprašanja, ki se pogosto zastavljajo v kontekstu poučevanja matematike in izobraževanja bodočih učiteljev. Zaradi nenadomestljive vloge osnovnošolskih učiteljev v procesu poučevanja in učenja matematike smo si zastavili sledeči cilj raziskave: preveriti kakovost znanja naših bodočih osnovnošolskih učiteljev o obsegu in ploščini pravokotnika. Učiteljevo znanje o matematičnih vsebinah mora biti predvsem konceptualno in ne proceduralno. Rezultati testiranja so pokazali, da je konceptualno znanje bodočih učiteljev šibkejše od proceduralnega. Zaradi pridobljenih rezultatov in vloge učbenika kot osnovnega učnega vira smo se odločili predstaviti tudi rezultate analize vrst nalog o obsegu in ploščini pravokotnika v učbenikih za osnovno šolo.

Received 31. 1. 2023 / Accepted 16. 6. 2023

Scientific paper

UDC 378.091.3:514.1

KEYWORDS: area of rectangle, perimeter of rectangle, conceptual and procedural knowledge, primary school teachers, mathematics textbook

ABSTRACT – What is the quality of the mathematics knowledge of our pupils and our students – future teachers? Do they know how to apply such knowledge in real situations? Can they explain the concepts and procedures or do they just practice and automate the procedures without reasoning? These questions are often asked in the context of teaching mathematics and the education of future teachers. Considering the irreplaceable role of elementary (primary) schoolteachers in the process of teaching and learning mathematics, we set the goal of the research: to check the quality of our future primary school teachers' knowledge of the perimeter and area of a rectangle. Teachers' mathematical content knowledge must primarily be conceptual knowledge rather than procedural knowledge. The test results showed that the conceptual knowledge of future teachers is weaker than the procedural knowledge. Due to the obtained results and the role of textbooks as a basic learning resource, we have decided to also present the results of an analysis of the types of tasks related to the perimeter and area of a rectangle in elementary school textbooks.

1 Introduction

Although we live in a world of rapid technological development, which implies the availability of a large amount of information, the role of the teacher is irreplaceable in education, especially in the lower grades of elementary school. Effective mathematics teaching requires appropriate teacher competencies (Jukić Matić et al., 2020). This includes quality lesson planning and preparing the individual to successfully solve everyday problems even after completing formal education.

There has been a continuing interest in understanding and describing the mathematical content knowledge (MCK) and pedagogical content knowledge (PCK) of primary

mathematics teachers. In this paper, we analyze future primary teachers' content knowledge about the area and perimeter of a rectangle. In addition, we will review the content of the mathematics textbooks for elementary school, which is related to our topic, because the textbooks are an important component in the learning process, including the learning of mathematics. "Although textbooks describe the minimal effort that teachers and students should undertake in the learning process, they have a significant role" (Pratama and Retnawati, 2018, p. 6).

Theoretical framework

Shulman (1987) proposed a foundation for describing the knowledge base for teaching. He described subject content knowledge as a central feature and as the "amount and organization of knowledge in the mind of the teacher" (p. 9), and described PCK as the blending of content and pedagogy. Teacher's PCK is needed to teach different mathematical topics, making them comprehensible to learners; it is also necessary for understanding student misconceptions, knowing how topics are organized and taught, as well as influencing the ability to adjust lessons catering for all learners (Shulman, 1987). Relying on the work of Shulman (1987; 1998), as well as their own research, Ball et al. proposed a framework for distinguishing the different types of knowledge required for teaching mathematics: *Domains of Mathematical Knowledge for Teaching* (Ball et al., 2008). Their framework consisted of two broad categories: subject matter knowledge and pedagogical knowledge.

In this paper, we take mathematical content knowledge to be knowledge about the subject matter in mathematics, knowledge about its structure, concepts, facts, skills and definitions, as well as methods of justification and proof. Teachers' mathematical content knowledge must primarily be conceptual knowledge rather than procedural knowledge. Lipovec et al. (2015) confirm in their research that conceptual knowledge proves to be an effective source for procedural knowledge, so they suggest that teachers focus on the development of concepts. Teachers need a rich and deep understanding of their subject in order to respond to all aspects of their pupils' needs. Only when the teacher understands something well enough, are they able to teach others. They need to overcome the various obstacles that might otherwise deny their pupils access to knowledge (Yeo, 2008). Pedagogical content knowledge cannot be developed without strong subject content knowledge. Only with firm subject content knowledge (in our case, mathematical content knowledge) and pedagogical content knowledge is the teacher able to plan teaching and learning activities, choose appropriate examples and exercises, and organize their pupils' work in the classroom. Teachers' firm mathematical content knowledge and pedagogical content knowledge enable high-quality teaching of mathematics and the achievement of the outcomes prescribed by the curriculum. Some past studies (Vekić Kljaić and Lučić, 2021) emphasize the importance of the teacher's professional development and their (self-)reflection (Petlak, 2021) as an integral part of the design of the school curriculum.

Literature review

Studies have shown that novice teachers often struggle to represent concepts in an understandable manner to their students because they have little or no PCK at their disposal (Kagan, 1992; Reynolds, 1992). Yeo's study (2008) showed that a number of

primary teachers with weak mathematical content knowledge were focused on rules and procedures related to calculating the area while teachers with strong content knowledge provided a conceptual explanation for each example and exercise. Concerns within primary teacher education are even more prevalent. Several studies indicated that many primary teachers have a poor conceptual understanding of area, relying on rules and formulas, and have difficulties in explaining why these formulas work (Baturo and Nason, 1996; Berenson et al., 1997; Menon, 1998; Reinke, 1997). Baturo and Nason (1996) found that some primary teachers had poor knowledge of area, providing responses which were incorrect and rule-dominated. Berenson et al. (1997) in an international study of primary teachers' understanding of area required primary teachers to design a lesson plan introducing the concept of area to middle school students. The findings showed that many primary teachers had a primarily procedural knowledge of area, which was reflected in their procedural and formula-dominated lesson plans. In today's era of computerization and technology, "a conceptual approach to mathematics is more essential than a procedural approach" as the technical aspects of mathematical work are largely performed by computing technologies (Bergsten et al., 2016, p. 550). "Numerical and computational skills have become less important in mathematics education, and meta-mathematical, communicative skills are seen as more important, embodying what is thought of as "real" mathematical knowledge" (Österman and Bråting, 2019, p. 467).

Menon (1998) investigated 54 primary teachers' understanding of area and perimeter and found that they have a procedural understanding of area and perimeter rather than a conceptual and relational understanding. Tatto et al. (2012) found that, although primary teachers "were generally able to determine the areas and perimeters of simple figures" (p. 136), they "were likely to have more difficulty answering problems requiring more complex reasoning in applied or non-routine situations" (p. 137).

Sáenz (2009) tested 140 pre-service elementary teachers with various PISA tasks and observed difficulties in the conceptual knowledge of the respondents, which are related to a poor understanding of the concept of perimeter. He found that the "lack of conceptual profundity in understanding mathematical objects means that the only tools they used to tackle the mathematical tasks were elemental algorithms and stereotypical rules with a minimum of underlying conceptual knowledge" (p. 136).

On the other hand, research was done on the contents of textbooks with regard to tasks that require conceptual and/or procedural knowledge. The number of tasks that require a conceptual understanding is low compared to those that are solved by procedures (algorithms) (Ozer and Sezer, 2014). An analysis of Brazilian, Japanese and U.S. textbooks showed that Brazilian and U.S. textbooks contained a procedure-based approach, while Japanese textbooks highlighted conceptual understanding, which could be an essential differential to explain the Japanese results in PISA (Souza and Powell, 2021).

2 Methodology

As stated in the theoretical part of the paper, teachers' subject content knowledge and textbooks are essential factors in teaching and learning mathematics. The aim of the research is to determine future primary teachers' content knowledge of the concepts

of perimeter and area of a rectangle (or a square as a special type of rectangle) in terms of their conceptual and procedural knowledge. In addition, we analyzed elementary school mathematics textbooks to check if they include tasks related to the perimeter and area of rectangles that require conceptual knowledge, compared to those that require procedural knowledge.

The research included the following components: selecting the prescribed learning outcomes related to the concepts of perimeter and area of a rectangle; creating tasks for our respondents (future teachers) based on the outcomes; and determining the number of tasks about the perimeter and area of a rectangle in elementary school textbooks according to the type of knowledge required, i.e., conceptual and procedural knowledge. The research was conducted during the winter semester of the 2020/2021 academic year and involved 40 students in the Department of Teacher Education at the Faculty of Humanities and Social Sciences in Split, University of Split, i.e., future primary school teachers. The research instrument consisted of four short tests that included various arithmetic and geometry problems. Each test contained one problem related to the perimeter or area of a rectangle (or a square as a special type of rectangle). Those problems are presented in Table 1.

Table 1

Problems Involving the Perimeter and Area of a Rectangle

Problem	*Task*
Problem 1	Let one side of the rectangle be 10 cm long and the other 2 dm. Calculate the perimeter of that rectangle.
Problem 2	If we have a board 30 cm long, what are all the dimensional possibilities for making a wooden picture frame of a rectangular shape by cutting the board, if we know that the dimensions are given by natural numbers in cm? We do not want the frame to be narrower than 5 cm.
Problem 3	Calculate the area of a square with a side length of 5 cm. Calculate the area of a rectangle with side lengths of 2 dm and 15 mm.
Problem 4	On a bathroom floor of a rectangular shape, measuring 2 m × 1.5 m, we must place square tiles measuring 30 cm × 30 cm. How many tile pallets do we need if one pallet contains 20 tile pieces?

Problems 1 and 3 are given in the mathematical context and questions are explicitly stated. To solve those problems, students need to know the definition of the perimeter and area of a rectangle (or a square as a special type of rectangle). Moreover, it is possible to solve those tasks knowing only formulas for the perimeter and area of a rectangle and a square without a deeper understanding of the concepts of perimeter and area.

Therefore, Problems 1 and 3 are related to procedural knowledge about the perimeter and area of a rectangle (or a square). On the other hand, Problems 2 and 4 are given in a nonmathematical context. To solve those problems, students have to recognize the "hidden" concepts in their formulations. In Problem 2, students have to connect the frame of the picture with the perimeter of the rectangle. Problem 4 requires an identification of the given elements: the shape of the floor, its measure as a rectangle and

its area; the shape of the tile, its measure as a square and its area. This problem also requires knowledge of quotative division.

In parallel, mathematics textbooks for middle school were analyzed to check if there are problems involving the area and perimeter of rectangles that encourage conceptual and/or procedural knowledge.

3 Results and discussion

In the following passages, we will present the educational outcomes prescribed by the Croatian curriculum for the subject of mathematics, related to the perimeter and area of a rectangle (Ministarstvo znanosti i obrazovanja, 2019).

In the third grade, the student is expected to determine the perimeter of geometric figures (p. 41). The student draws a rectangle and a square of a certain side length, then estimates and calculates the perimeter. In the fourth grade, the concept of the area of squares and rectangles is introduced. The fourth-grade student gets to know the standard measures for the area and then measures the area of rectangular figures by covering the area with a unit square. At the end of the fourth grade, the student is expected *to compare the areas of figures and measure them with unit squares* (p. 50). In the fifth grade, the knowledge related to the calculation and application of the perimeter and area of squares and rectangles is expanded. In the recommendations for achieving the learning outcomes, teachers are suggested to use dynamic geometry programs and other appropriate and available interactive computer programs and tools, as well as educational games (p. 59), to evaluate and solve tasks with content related to the students' environment and to encourage them to create drawings composed of geometric figures and calculate their perimeters and areas (p. 62). In the seventh grade, the student is expected to justify the choice of strategy in a problem situation when calculating volume and area (p. 83). Therefore, the focus is not on evaluating calculation techniques, but on the student's logical thinking and ability to analyze problems. Assigning problem situations for perimeter and area calculation that concern problems from real life and encouraging students to find problem situations by themselves is recommended (p. 83). In the eighth grade, problems related to the square and rectangle are included when applying the Pythagorean theorem.

Given that the learning outcomes are directed towards the application and argumentation of the selection of strategies when calculating the area, the future teachers were assigned tasks that are described in the previous section. The percentages of solving each of the four tasks are presented in Table 2.

As shown in Table 2, Problems 1 and 3, which are given in a mathematical context and are related to procedural knowledge, have a 78.57 % and 73 % problem-solving success rate, respectively. On the other hand, Problems 2 and 4 are related to conceptual knowledge about the area and perimeter of a rectangle. Those problems are given in a nonmathematical context. They are related to real situations where the concepts of area and perimeter should be recognized and applied. Only 21.43 % and 35 % of respondents, respectively, solved these problems successfully.

Table 2

Percentage of Solving a Particular Problem

Problem	*Percentage of solving*
Problem 1	78.57%
Problem 2	21.43%
Problem 3	73%
Problem 4	35%

We will also comment on the most common errors. Among the surveyed future primary teachers, every second respondent did not even try to solve Problem 2; consequently, 64% of respondents did not successfully solve the problem. In Problem 1, as well as in Problem 4, the most common errors are related to the conversion of the units of measurement. In Problem 3, in addition to the error of calculating the perimeter instead of the area, 19% of students, future primary teachers, who did not successfully solve the task, were on the right track in terms of calculating the bathroom floor area and tile area, but they did not know how to connect those facts to get the number of required tiles and consequently calculate how many pallets to buy.

Furthermore, a t-test was used to determine the significance of the differences in successful solutions related to problem pairs: Problem 1 and Problem 2 that are related to the concept of the perimeter, and Problem 3 and Problem 4 that deal with the concept of the area. The results can be seen in Table 3.

Table 3

T-test Results

Problem pairs	*t-test results*
Problem 1 – Problem 2	$p = 0.00111$
Problem 3 – Problem 4	$p = 0.00024$

Statistically significant differences were detected in both pairs ($p < 0.05$): between Problems 1 and 2, and Problems 3 and 4. Thus, the success of students in solving procedural problems on the perimeter of a rectangle is statistically significantly better than their success in solving conceptual problems on the perimeter of a rectangle. The same is true for the concept of the area of a square and a rectangle: we see that the difference is statistically significant in favor of procedural tasks.

The above-mentioned results are certainly not satisfactory, as we could have predicted based on the reviewed literature and previous research (Isleyen and Isik, 2003; Khashan, 2014; Lauritzen, 2012). One of the possible causes of poor students' performance may be the low presence of conceptual tasks in elementary school mathematics textbooks; therefore, we reviewed mathematics textbooks for elementary school from two randomly selected Croatian publishers. The following table shows the results of an

overview of the number of conceptual and procedural tasks in which the perimeter and/or area of a rectangle (or a square as a special type of rectangle) are required.

Table 4

Number of Procedural and Conceptual Tasks about Perimeter and Area in Textbooks

Grade	*Conceptual tasks*		*Procedural tasks*	
	Publisher 1	*Publisher 2*	*Publisher 1*	*Publisher 2*
3	1	1	13	4
4	5	1	34	4
5	3	7	27	57
6	4	8	20	59
7	3	1	10	20
8	11	9	36	39

Our goal is not to compare textbooks from different publishers, but to observe the representation of the types of tasks according to the knowledge needed to solve them, i.e., conceptual and procedural knowledge. Below, we will also comment on the context of the reviewed tasks. In the third grade, conceptual knowledge of perimeter is required in tasks in which students are asked to calculate the length of yard fences, of a tablecloth lace border, a window rubber band, etc. Procedural tasks are those that ask students to draw, measure or calculate the perimeter. In the fourth grade, the area of a rectangle is studied. Students' conceptual knowledge is applied in tasks in which the calculation of the area of a rectangle is not explicitly required, but the tasks include calculating the area of a playground, vineyard, bathroom, tiles, etc. Assignments requiring procedural knowledge ask students to measure the lengths of the sides of a rectangle and then calculate its area, or calculate the area of the rectangle if its side lengths are given. In the math textbooks for middle school (from the fifth to the eighth grade) of Publisher 2, tasks that require the application of conceptual knowledge are included in the part of the lesson called "from the world of work" or "connect and apply". In the fifth-grade and sixth-grade textbooks, such tasks ask students to calculate the area and perimeter of a playground, field, room, garden, etc. For example: "How many pieces of an 0.4 m long corner lath should be bought to border a room of the given dimensions?". Some of those tasks are given only with text, and some contain an image of the object with the corresponding dimensions. The same types of assignments appear in the fifth-grade and sixth-grade textbooks of both publishers. Tasks that require procedural knowledge about the perimeter and area of a rectangle are prevailing in the fifth-grade and sixth-grade textbooks of both publishers. In those tasks, the lengths of the sides of a rectangle are given and students are asked to calculate its perimeter and area. In seventh-grade textbooks, tasks that require the application of conceptual knowledge about the perimeter and area of a rectangle include ratios, percentage and cost. In eighth-grade textbooks, students are asked to apply the Pythagorean theorem when calculating the area,

perimeter or diagonal of a TV screen, monitor, playground or pool, or the distance of a ship from a harbor, etc.

The following table shows the representation of conceptual tasks in relation to procedural ones in the analyzed textbooks.

Table 5

Representation of Conceptual Tasks

Grade	*Conceptual knowledge required to solve task*	
	Publisher 1	*Publisher 2*
3	7%	20%
4	13%	20%
5	10%	11%
6	17%	14%
7	23%	5%
8	23%	19%

The low presence of tasks that promote conceptual knowledge is noticeable in the analyzed textbooks. As teachers are often guided by textbooks when planning their lessons, they teach and demonstrate mathematical content using tasks from the textbook. Usually, students practice math using the textbook. "Giving excessive importance to the algorithm over the underlying concept is a particularly serious problem among those who are to be future teachers" (Sáenz, 2009, p. 135). Therefore, the question arises whether the low presence of this type of tasks is one of the causes of the poor performance of students in mathematics in general, but also of the poor performance of students in solving conceptual tasks compared with the success of students in solving procedural tasks.

4 Conclusion

Whilst learners of mathematics need only to be aware that they have gained sufficient knowledge to pass examinations (*learner-knowledge*), teachers need to have multiple and fluid conceptions of that knowledge to know how progress might be made through that knowledge (*teacher-knowledge*).

"Conceptual and procedural knowledge, as basic aspects of mathematical competencies, have been developing through informal, but primarily through formal experience and education. Therefore, it is important to encourage these two forms of knowledge in students through appropriate approaches, so that they could become adaptive experts, without fear of mathematics and with an image of themselves as competent mathematicians" (Putarek, 2018, p. 468).

Primary teachers with weak content knowledge, both conceptual and procedural, and those who are insecure about their mathematical content knowledge are predisposed to telling pupils rules and explaining procedures. "Teacher candidates need to possess a conceptual understanding of a problem regardless of whether it can be solved by applying a well-defined algorithm or the computational capabilities of a digital tool" (Abramovich, 2015, p. 48). On the other hand, teachers with strong mathematical content knowledge should have a solid background to develop pedagogical content knowledge, thus providing higher-quality knowledge to their pupils.

Our results show that future primary teachers need to work more on conceptual knowledge, which implies a greater verbalization of problem-solving procedures and its application in a real-world context. Contextual knowledge is "a very important tool for solving the most difficult tasks: those that demand something more than a simple reproduction of algorithms or formulas" (Sáenz, 2009, p. 135).

In addition, future teachers should master the methodical procedures of determining the perimeter as the sum of the length of all sides of a geometric figure, and the area as a measure of the figure in the plane. For perimeter, these procedures involve adding the lengths of rectangles, measuring their lengths, and finally summing the lengths of the sides. For area, these procedures include observing the unit of measurement for the area – the unit square, and ordering the unit squares on the surface of the rectangle, from which the formula for calculating the area is derived. If the knowledge of students (future teachers) remains at the procedural level, then there is a danger that their teaching will be focused on procedures and formulas, which will not lead to achieving the desired student learning outcomes.

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Znanje bodočih osnovnošolskih učiteljev o obsegu in ploščini pravokotnika

Učiteljski poklic je verjetno najstarejši poklic, katerega temelji so bili postavljeni že pred nastankom šole kot institucije. Družbene spremembe, zahteve sodobne družbe in globalizacija so spremenile naravo učiteljevega dela, ne pa tudi njegovega vpliva in odgovornosti za kakovost izobraževalnega sistema. Kakšna je kakovost matematičnega znanja naših učencev in naših študentov – bodočih učiteljev? Ali znajo to znanje uporabiti v dejanskih situacijah v realnem okolju? Ali lahko pojasnijo pojme in postopke ali samo vadijo in avtomatizirajo postopke brez razlage? To so vprašanja, ki se pogosto postavljajo v kontekstu pouka matematike in izobraževanja bodočih učiteljev. Aktualnost teh vprašanj nikoli ne zamre. V pričujočem članku pojem matematično znanje bodočih učiteljev razumemo kot znanje o matematičnih konceptih – poznavanje strukturiranja matematičnih konceptov in sposobnost argumentiranja vzročno-posledičnih zvez med njimi. Zato matematična znanja bodočih učiteljev vključujejo (fleksibilno) obvladovanje matematičnih dejstev: od definiranja matematičnih izrazov, navajanja in dokazovanja izrekov do uporabe matematičnih izrazov in pravil pri reševanju problemov (v okviru šolske matematike). Matematično znanje bodočih učiteljev bomo spremljali skozi priz-

mo klasifikacije na konceptualno in proceduralno znanje. Konceptualno znanje omogoča razumevanje pojmov, idej in zakonitosti, ki določajo neko območje teh odnosov med njimi. Proceduralno znanje, ki se nanaša na posedovanje veščin, poznavanje algoritmov in strategij reševanja nalog, omogoča hitro in učinkovito reševanje problemov. Znanje učitelja o matematični vsebini mora biti predvsem konceptualno in ne proceduralno. Lipovec idr. (2015) v svoji raziskavi potrdijo, da se konceptualno znanje izkaže kot učinkovit vir za proceduralno znanje, zato učiteljem predlagajo usmeritev pozornosti v razvoj konceptov. Na strani učiteljev je pomembno bogato in globoko razumevanje predmeta, da bi lahko odgovorili na vse vidike potreb svojih učencev. Šele takrat, ko učitelj snov dovolj dobro razume, lahko poučuje druge. Učiteljevo dobro poznavanje vsebin, ki jih poučuje, ter samozavest in samozavest pri prenašanju tega znanja na učence pozitivno vplivajo na uspeh učencev. Učiteljevo solidno matematično znanje je predpogoj za izgradnjo matematičnega znanja za poučevanje, kar vključuje sposobnost analiziranja učenčevega razmišljanja, ki je privedlo do napačnega odgovora, prepoznavanje, česa učenec ne razume, in odločitev, kako najbolje predstaviti matematično idejo, tako da učenci predstavljeno lahko razumejo.

Ob preučevanju številnih študij smo opazili problem slabega usvajanja geometrijskih pojmov in njihovih povezav. Ob upoštevanju omenjenega smo se odločili za pojma obseg in površina, ker smo na osnovi izkušenj in dela s študenti – bodočimi učitelji na fakulteti in učenci v šolah opazili napačna poimenovanja navedenih pojmov na splošno in neznanje ter negotovost pri geometriji precej bolj kot na področju aritmetike. Z dolgoletnim spremljanjem in analizo pouka matematike v osnovni šoli smo opazili, da je število ur geometrije manjše v primerjavi z drugimi področji matematike. Poleg tega smo ugotovili, da je z namenom realizacije vsebine o obsegu in površini poudarek največkrat na reševanju večjega števila nalog, v katerih je potrebno samo izračunati obseg in površino likov (ali dolžino stranice lika) za prenos danih podatkov v pripravljeno formulo.

Na podlagi pregledane literature smo ugotovili skladnost naših opažanj iz prakse z rezultati predhodnih raziskav o poznavanju pojmov obseg in ploščina pravokotnika (ter kvadrata kot vrste pravokotnika) pri bodočih učiteljev. Številne raziskave (Baturo in Nason, 1996; Berenson idr., 1997; Menon, 1998; Reinke, 1997; Yeo, 2008; Tatto idr., 2012; Sáenz, 2009) namreč kažejo, da pri učiteljih matematike prevladuje proceduralno znanje v primerjavi s konceptualnim. Vendar se v dobi informatizacije in sodobne tehnologije zdi, da je konceptualni pristop k matematični vsebini pomembnejši od proceduralnega. Glede na to, da se učitelji pri pripravi in izvajanju pouka opirajo na učbenike, potekajo tudi raziskave strukture nalog v učbenikih. Ena od nedavnih raziskav poudarja, da japonski učbeniki matematike spodbujajo konceptualni pristop, s katerim lahko razložimo uspeh japonskih učencev na testu PISA (Souza in Powell, 2021).

Cilj naše raziskave je ugotoviti znanje bodočih učiteljev o pojmih obseg in ploščina pravokotnika v luči pojmovnega in proceduralnega znanja. Prav tako smo želeli preveriti zastopanost nalog, povezanih z obsegom in ploščino pravokotnika, ki zahtevajo konceptualno znanje, v primerjavi s tistimi, ki zahtevajo proceduralno znanje, v učbenikih matematike za osnovno šolo.

Raziskava je obsegala naslednje sklope: izluščiti rezultate iz učnega načrta, povezane s pojmoma obseg in ploščina pravokotnika, in na njihovi podlagi izdelati naloge za študente, bodoče učitelje, ter določiti število nalog o obsegu in ploščini pravokotnika v učbenikih matematike, potrebnih za osnovno raven znanja: tako konceptualnega kot pro-

ceduralnega. Raziskava je bila izvedena v zimskem semestru študijskega leta 2020/2021 in je zajela 40 študentov, bodočih učiteljev. Raziskovalni instrument so sestavljali štirje kratki testi, sestavljeni iz različnih aritmetičnih in geometrijskih nalog. Vsak test je vseboval eno nalogo, ki se je nanašala na obseg ali ploščino pravokotnika (v posebnem primeru kvadrata). Proceduralno znanje je bilo potrebno za rešitev dveh nalog, ki sta bili podani v matematičnem kontekstu, medtem ko je bilo potrebno konceptualno znanje za rešitev preostalih dveh nalog, ki sta bili podani v nematematičnem kontekstu.

Analiza rezultatov je pokazala statistično značilne razlike med tipi nalog. Tako je uspeh učencev pri reševanju proceduralnih nalog, povezanih s pojmom obseg pravokotnika, statistično značilno boljši od uspeha pri reševanju konceptualnih nalog. Enako velja za naloge o površini kvadratov in pravokotnikov; razlika v uspešnosti je statistično pomembna v korist proceduralnih nalog. Glede na to, da so učni izidi o obsegu in površini v osnovni šoli (Ministarstvo znanosti i obrazovanja, 2019) usmerjeni v aplikacijo in argumentacijo teh konceptov, pridobljeni rezultati raziskave niso spodbudni. Rezultati upravičeno odpirajo vprašanje, kako lahko učitelji, ki nimajo zadostnega pojmovnega znanja o določenih matematičnih vsebinah, usmerjajo učence k doseganju načrtovanih učnih rezultatov.

Eden izmed možnih vzrokov slabega uspeha učencev in posledično tudi študentov – bodočih učiteljev bi lahko bila slaba zastopanost konceptualnih nalog v osnovnošolskih učbenikih matematike. Zato smo analizirali vsebine, vezane na obseg in površino, v učbenikih matematike za osnovno šolo dveh naključno izbranih hrvaških založnikov. Prešteli smo naloge glede na to, ali spodbujajo proceduralno ali konceptualno znanje, in navedli nekaj primerov iz učbenika. V analiziranih učbenikih je ugotovljena slaba zastopanost nalog, ki spodbujajo konceptualno znanje, v primerjavi s tistimi, ki iščejo proceduralno, in se giblje od 7 % do 23 %, odvisno od razreda in založnika. V učbenikih so pojmovna znanja potrebna pri nalogah o obsegu pravokotnika (kvadrata), kot so npr. računanje dolžine dvoriščne ograje, obrobljanje prta s čipko, okna z gumico in podobno, pojavijo se naloge za izračun površine parkirišča, vinograda, kopalnice, ploščic itd. Proceduralne so naloge tipa nariši, izmeri, izračunaj prostornino in/ali površino ali izračunaj površino pri že podanih dolžinah strani. Učitelji največkrat pri načrtovanju pouka pogosto sledijo učbenikom, saj matematične vsebine poučujejo in demonstrirajo s pomočjo nalog iz učbenika. Običajno učenci vadijo matematiko s pomočjo učbenika. Zato se zastavljata vprašanji, ali je slaba zastopanost te vrste nalog eden od vzrokov slabega uspeha učencev pri matematiki na splošno in ali je uspeh učencev pri reševanju konceptualnih nalog slab v primerjavi z uspehom učencev pri reševanju proceduralnih nalog. Navedeni tipi matematičnega znanja se razvijajo skozi neformalno ali predvsem formalno znanje in izobraževanje. Naši rezultati kažejo, da morajo učitelji primarnega poučevanja bolj delati na konceptualnem znanju, kar vključuje večjo verbalizacijo postopka reševanja problema ter njegovo uporabo v stvarnem kontekstu. Če znanje študentov (bodočih učiteljev) ostane na proceduralni ravni, obstaja nevarnost, da bo njihov pouk usmerjen na postopke in formule, kar ne bo privedlo do doseganja želenih rezultatov učenja učencev. Ko k naštetemu dodamo še učbenike, ki spodbujajo proceduralne naloge, postane doseganje želenih učnih rezultatov še težje in negotovo. Bogato znanje o matematičnih in pedagoških vsebinah učitelju omogoča kakovostno izvajanje pouka matematike in doseganje rezultatov predpisanega učnega načrta in programa. Dober učitelj uporablja učbenik kot pomožno in ne kot glavno

didaktično sredstvo. Učitelji z razvitim konceptualnim in proceduralnim znanjem lahko kritično pregledajo učbenik in poiščejo načine za odpravo morebitnih pomanjkljivosti z vidika spodbujanja določene vrste znanja.

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Effectiveness of Physical Activity Intervention during Music Lessons

Prejeto 13. 1. 2023 / Sprejeto 8. 5. 2023

Znanstveni članek

UDK 796:78:373.3

KLJUČNE BESEDE: šola, učne ure, mlajši šolarji, merilnik pospeška, intenzivnost

POVZETEK – Veliko je bilo že objavljenih študij, ki proučujejo vključevanje gibalne aktivnosti otrok v pouk različnih šolskih predmetov. Zelo redke so študije, ki preučujejo vključevanje gibalne aktivnosti otrok v pouk glasbene umetnosti. Prav zato smo se odločili, da s pomočjo merilnika pospeška izmerimo količino in intenzivnost posameznih fenotipov gibalne/športne aktivnosti prvošolcev le med uro glasbene umetnosti brez gibalne in z gibalno intervencijo. Sto osem otrok, v starosti šest in sedem let, iz dveh slovenskih obalnih osnovnih šol je nosilo merilnik pospeška med dvema urama glasbene umetnosti. Primerjali smo fenotipe gibalne aktivnosti med urama glasbene umetnosti z in brez intervencije. Otroci so v povprečju deležni več gibalne neaktivnosti med učno uro glasbene umetnosti brez intervencije kot z intervencijo (p = 0,001, d = 2.8), poleg tega imajo večji delež časa srednje (p = 0,001, d = 5.9) in tudi visoke (p = 0,001, d = 30) intenzivnosti gibalne/športne aktivnosti med uro glasbene umetnosti z intervencijskim programom kot med običajno uro glasbene umetnosti. Otroci so med običajno uro glasbene umetnosti deležni glede na čas kar 39% več gibalne neaktivnosti kot med uro glasbene umetnosti z gibalnim intervencijskim programom. Priporočamo, da prihodnje študije vključijo večji vzorec otrok, pri čemer naj merilnike pospeška nosijo vsaj pet dni zapored.

Received 13. 1. 2023 / Accepted 8. 5. 2023

Scientific paper

UDC 796:78:373.3

KEYWORDS: school, lessons, young children, accelerometer, intensity

ABSTRACT – There are many previously published studies that examine the integration of children's physical activity into various school subjects. However, studies that integrate children's physical activity into music lessons are very rare. Therefore, we decided to use an accelerometer to measure the amount and intensity of individual physical activity phenotypes of first graders during a music-only lesson, with and without a physical activity intervention. One hundred and eight children, aged six to seven, from two Slovenian elementary schools in the coastal region wore the accelerometer during two music lessons. We compared the physical activity phenotypes during music lessons with and without an intervention. On average, children were more physically inactive during music lessons without an intervention than during music lessons with an intervention (p = 0.001, d = 2.8) and spent a higher proportion of time doing moderate (p = 0.001, d = 5.9) and vigorous (p = 0.001, d = 30) physical activity during music lessons with an intervention than during regular music lessons. During regular music lessons, children spent 39% more time being physically inactive than during music lessons with a physical activity intervention programme. We recommend that future studies include a larger sample of children and that they wear the accelerometers for at least five consecutive days.

1 Introduction

Physical activity in childhood is an important component of a healthy lifestyle. Regular and sufficiently intense physical activity has a positive effect on the child's overall development and on maintaining and protecting health (NICE, 2007). It also reduces the risk of many chronic non-communicable diseases (Kriska et al., 2003). The lack of physical activity in childhood may contribute to the development of chronic noncommunicable diseases and the prevalence of overweight and obesity (Sardinha et al., 2008).

Despite the known positive effects of regular physical activity on an individual's development and health, a significant proportion of children and adolescents have lower levels of physical activity than recommended (Biddle et al., 2004; Roberts et al., 2004; Volmut et al., 2013). Several organizations and associations recommend a minimum of 60 minutes of moderate-to-vigorous intensity of physical activity (MVPA) per day for normal healthy development in children and adolescents (DoH, 2019; WHO, 2011). It has been recommended that students complete at least 50 % of daily MVPA at school (Pate et al., 2006), but studies suggest that the school MVPA accounts for only 22–40 % of the daily MVPA (Gidlow et al., 2008; Long et al., 2013; Mooses et al., 2016; Yli-Piipari et al., 2016). Volmut et al. (2013) find that from 21 % to 67 % of all Slovenian children receive more than the 60 minutes of MVPA recommended for a healthy lifestyle. Overall, 81 % of adolescents (aged 11–17) do not meet these recommendations. Similar findings are reported by other authors (Demetriou et al., 2017; Li et al., 2017; Roberts et al., 2004).

However, the recommendations do not specify how much time children and adolescents may be physically inactive during the day. They only mention that children should not spend more than two hours per day using electronic media for entertainment, especially during the day (DoH, 2019). Piątkowska and Biernat (2016) state that 75.2 % of boys and 66.1 % of girls spend at least 2 hours a day sitting; that as many as 63.6 % of boys and 60.4 % of girls spend more than 2 hours a day watching TV; and that as many as 52.5 % of boys and 18.7 % of girls only play video games. Volmut (2014) further states that the amount of physical inactivity (including sitting) is extremely high in children and adolescents, ranging from 583 to 615 minutes a day, which corresponds to > 70 % of waking time. Ayala-Guzmán et al. (2017) find that Mexican children aged eight to twelve are inactive for an average of 3733.5 minutes per week (533 minutes a day).

Several studies examined the variability of physical activity within a day or between days (Brasholt et al., 2013; Bringolf-Isler et al., 2009; Hesketh et al., 2014; Kristensen et al., 2008; Olesen et al., 2014; Riddoch et al., 2007; Verbestel et al., 2011). Most studies report that children are more physically active in the afternoon than in the morning (Hardman et al., 2009; Nilsson et al., 2008; Volmut, 2014). It is also apparent that children are less active during the week due to the nature of school instruction and commitments. However, physical activity patterns within days of the week vary or even differ from week to week, which may be related to class schedules, school workloads, and afternoon activities.

Educational institutions play a central role in promoting and developing healthy lifestyles and managing children's daily physical activities, especially in countries where public education is widely available and compulsory for most children (Hatfield and Chomitz, 2015). Children may spend five to nine hours per day at school (Hauptman and Komotar, 2010), where they are involved in physical activities during physical education classes, recess, and after school. Physical activity can also be increased through outdoor play during school hours, which also contributes to the developmental aspect of outdoor play (Ceciliani and Bortolotti, 2013). In addition, it is still possible to incorporate physical activities into lessons that do not normally include physical activity, and in this way reduce physical inactivity during school hours. The school environment represents a financially favourable and ideal setting for the implementation of intervention programmes, since they are aimed at many children. It provides adequate

facilities and sports equipment, as well as teachers who can incorporate physical activities into their lessons.

As for intervention programmes that incorporate learning through physical activity, evidence shows that they are feasible (Delk et al., 2014) and affordable (Babey et al., 2014). More importantly, the results of these intervention studies show increases in physical activity in children (Daly-Smith et al., 2018; Innerd et al., 2019; Mahar et al., 2006; Martin and Murtagh, 2017; Stewart et al., 2004; Szabo-Reed et al., 2017; Vetter et al., 2020); an increase in their attention and focus on the subject matter (Howie et al., 2015; Ma et al., 2015); higher learning effectiveness (Mahar et al., 2006; Szabo-Reed et al., 2017); and consequently better learning performance (Daly-Smith et al., 2018; Have et al., 2016; Howie et al., 2015; Szabo-Reed et al., 2017). Habe (2018, p. 13) reported that if we want to increase children's motivation for activity lessons and increase their alertness, we can play music loud or even include physical activity. In addition, Sember et al. (2019, p. 10) note in their review that there is ample evidence of the effects of physical activity on children's school performance abroad, but unfortunately the results of Slovenian studies are not consistent in this regard.

Several studies have been published (Adkins et al., 2015; Hatfield and Chomitz, 2015; Volmut, 2014) that examined children's physical activity during school lessons, especially in subjects that do not normally involve physical activity. However, according to recent studies, the average amount of MVPA during school instruction is about 1 % (Martin and Murtagh, 2015; Mooses et al., 2016), while others have found that MVPA can account for up to 13 % of instructional time (Bailey et al., 2012; Nettlefold et al., 2011). Furthermore, more than 70 % of instructional time is spent sitting (Bailey et al., 2012; Martin and Murtagh, 2015; Nettlefold et al., 2011). In America, the TAKE 10! programme was developed to reduce children's physical inactivity during the school day and increase guided physical activity in the classroom. Kibbe et al. (2011) find that children involved in the TAKE 10! programme had a 13 % increase in physical activity. Mahar et al. (2006) implemented the Energizes programme with the intention of incorporating physical activity into the curriculum of courses/subjects that do not normally include physical activity. Children who participated in the programme took 782 more steps than other children.

There are many previously published studies that examine the integration of children's physical activity into various school subjects. However, studies that integrate children's physical activity into music lessons are very rare. Therefore, we decided to use an accelerometer to measure the amount and intensity of individual physical activity phenotypes of first graders during a music-only lesson, with and without a physical activity intervention.

2 Method

Participants

The study involved 108 children (50 boys), aged six to seven, from two randomly selected elementary schools on the Slovenian coast. We submitted the draft of the study to

the school administration. Prior to the study, we obtained written consent from the school principals and the children's parents. The entire data collection process was conducted in accordance with the requirements of the Personal Data Protection Act (RS, 1999).

Instruments

The amount and intensity of physical activity were measured with the accelerometer "MTI Actigraph" (Manufacturing Technology Inc., Fort Walton Beach, FL, USA). Before the start of the lessons, the children were equipped with the accelerometers, with a rubber band around the belt attached to the right hip. During the two lessons, we measured the amount and intensity of physical activity using the accelerometer and calculated the time spent in each phenotype of physical activity. At the end of the lesson, we collected them and transferred the data to the personal computer for further analysis. Only the data from the lessons were analysed. We processed the data for each 15-second epoch. The overall level of physical activity was reported in counts per minute (cpm), while minutes spent in physical activity were reported for sedentary (< 100 cpm), light (100–1262 cpm), moderate (1263–4135 cpm), and vigorous (> 4135 cpm) physical activity intensity phenotypes (Freedson et al., 2005).

Proceedings

The study was conducted during the last week of May and the first week of June 2016. Children from both schools participated in two music lessons in which they learned to practise and develop rhythmic listening through music and didactic games. The first music lesson included musical didactic games with physical activities, while the second lesson did not include physical activities. Both music lessons were held 7 days apart. Both lessons had the same learning objectives.

Description of the physical activity intervention

During the first week, the children developed and reviewed their sense of rhythm using music and didactic games (e.g., Dancing around Chairs, Rhythmic Jumping, Moving in Different Directions, Icemen, Birds in Nests, and Train). The children were active and moving most of the time as they walked, ran, jumped, marched, and hopped to the rhythm. The second music lesson went as usual and the children participated in musical and didactic games (e.g., Musical Hat, Telephones, The Hidden Treasure, What's My Name?, The Bell, What Instrument Is That? and Who Called You?) without much physical activity.

Description of the ordinary course of a music lesson

During an ordinary music lesson, the children played musical didactic games in which they creatively expressed their musical experiences, felt joy in music, and relaxed and motivated themselves to work through the games. During the musical didactic games, they performed small coordinated movements and got used to actively listening to the songs. They practised their verbal communication, had to distinguish voices by colours and the direction from which the sound came. We compiled, adapted and named the listed didactic games for the purpose of the study. We started with the game "What's My Name?". The children stood in a circle in front of their chairs. First, the teacher clapped

his hands each time he pronounced a syllable of his name, which the children then repeated. Everyone introduced themselves in the same way and we all clapped our hands to the syllables of each child's name. In the second musical didactic game, the "Musical Hat", we placed the chairs in a circle, close together. We put a hat on the head of one of the children. While the music was playing, the child had to put the hat on the head of his neighbour in rhythm with the music, who then passed it on again in the same rhythm. In the next musical didactic game, "Telephones", the children were still sitting on chairs in a circle. On the back of one of the children, we played a short rhythmic pattern by tapping lightly, which the children then repeated one by one until it reached the first child, who had to clap his hands in rhythm with the original pattern to see if it had been changed. We repeated the game by changing the sitting order of the children before each new "journey of the rhythmic pattern". In the next game, "The Hidden Treasure", we hid a rattle in the classroom while one of the children was outside the classroom. We had set up the rule that all the other children would help the person looking for the rattle by clapping their hands. When the searcher approached the hidden rattle, the children had to clap quickly and loudly. However, if the child moved away from the rattle or was far away, his classmates clapped slowly and quietly. In the last musical didactic game called "The Bell", the children sat on their chairs in a circle. In the middle of the circle sat a child who was blindfolded. We gave one of the children a bell and he passed it to the next, and so on. The bell travelled around the circle without ringing. We chose one child to ring the bell, and the blindfolded child had to point in the direction from which the sound came.

Description of the teaching process in a music lesson that includes physical activities

In the second lesson, in which the children moved while performing musical didactic games, they achieved the same learning objectives as in the first music lesson. In this lesson too, the children performed musical didactic games that we compiled, adapted, and named for the purpose of the study. In the first musical didactic game, "In the Meadow", the children chose their position in the classroom. We told them to imitate animals (butterflies, frogs, bears) only with their movements. When we played the rattle, the children imagined the flight of the butterflies. When they heard the scratcher, they imitated the jumps of frogs, and when they heard the drum, they imitated the running of a bear. In the musical didactic game "Dancing around Chairs" we placed chairs in a circle, but there was one chair less than there were children. We played music where the children expressed themselves with their movements, and when the music stopped, the children had to sit down on the nearest chair. The one who was left without a chair had to do 10 jumps by pulling his knees closer to his chest, and then he was allowed to play again. At the last attempt, we removed five chairs from the room. In the musical didactic game "Rhythmic Jumping", we stood in a circle with all the children. We presented a rhythmic pattern with different jumps and the children repeated it. By counting rhymes while walking, we chose a child who then presented his rhythmic pattern with jumps. In the next musical didactic game, we went to the world of clown puppets, where Nacek the Clown got a new drum, which he played day and night. But in order not to wake the sleeping people, he drummed very quietly at night. The children – the clown puppets – had to listen carefully to the drumming and guess whether it was day or night. When the teacher drummed softly, it was night and all the clown puppets moved very slowly from their left foot to their right foot. When the teacher drummed loudly, it was daytime and the clown puppets

woke up, jumped, ran – did everything clown puppets do. In the musical didactic game "Moving in Different Directions", the teacher played three instruments: sticks, the rattle and triangle. The children performed specific movements that were predetermined, each movement for a specific sound of the instrument. They expressed the sounds by moving around the room in different directions. For the sound of the drum, they marched forward; for the sound of the sticks, they walked backward; and for the sound of the triangle, they turned. In the musical didactic game "Icemen", we played lively music to the children and they expressed themselves through movement. When the music suddenly stopped, the children "froze" in place. No one was allowed to move until they heard the music again.

Data analysis

All data are shown with an average and standard deviation. Analyses were performed with the SPSS statistical package (IBM Coorp, USA). We used the Kolmogorov-Smirnov test to check the normality of the distribution. For normally distributed data, we used a paired-samples t test, and for nonnormally distributed data, we used a nonparametric Wilcoxon signed-range test. All decisions were made at a risk level of $p \leq 0.05$. In the case of observed differences, we also reported Cohen's d.

3 Results

We conducted two music lessons with the same learning objectives in which the children developed their rhythmic listening skills through musical didactic games. Although we did not measure how the objectives were met, we believe that the children met the objectives in both music lessons, but in a different type of physical activity.

The normality test confirmed normal distribution for all variables, except time spent in moderate-to-vigorous physical activity. The main results are shown in Table 1. We found that PAML increased overall physical activity by 1652 counts per minute ($p < 0.001$, $d = 12.0$). Physical activity phenotypes changed during the PAML class as follows:

- physical inactivity decreased by 17.5 minutes ($p = 0.001$, $d = 2.8$);
- moderate physical activity increased by 10.4 minutes ($p = 0.001$, $d = 5.9$);
- vigorous physical activity increased by 6.7 minutes ($p = 0.001$, $d = 30.0$), resulting in
- a 17.2-minute increase in moderate-to-vigorous physical activity ($p = 0.001$, $d = 9.12$).

Only low physical activity remained unchanged.

The results show that children achieved 17.2 minutes more moderate-to-vigorous physical activity during the 45-minute music class than during the regular music class, which corresponds to 28.7 % of the minimum daily recommendations for moderate-to-vigorous physical activity.

Table 1

Total Physical Activity and Time and the Proportion of Time Spent in Each Physical Activity Intensity Phenotype during Normal Music Lesson (without PAML) and during Physically Active Music Learning (PAML)

Activity		*No PAML*	*PAML*	*p (Cohen's d)*
Overall physical activity	/ cpm	255 (143)	1907 (467)	< 0.001 (12.0)
Physical inactivity	/ min /%	28.3 (6.3) 62.9 (13.9)	10.8 (3.3) 23.9 (7.4)	< 0.001 (2.8)
Low physical activity	/ min /%	14.5 (5.0) 32.2 (11.4)	14.8 (2.7) 32.9 (5.7)	0.681
Moderate physical activity	/ min /%	2.0 (1.7) 4.4 (3.9)	12.4 (3.2) 27.5 (6.9)	< 0.001 (5.9)
Vigorous physical activity	/ min /%	0,2 (0.3) 0.4 (0.5)	6.9 (2.8) 15.4 (6.3)	< 0.001 (30.0)
Moderate-to-vigorous physical activity	/ min /%	2.2 (1.9) 4.8 (4.2)	19.4 (3.9) 43.1 (8.7)	< 0.001 (9.12)

We also wanted to know if children's physical inactivity decreased by at least 30% during the music lesson with a physical activity intervention programme. We found that children were physically inactive 62.9% of the time during a regular music lesson, but only 23.9% of the time during a music lesson with a physical activity intervention programme.

4 Discussion

We found that the music lesson with additional physical activities included 17.5 minutes less time spent in physical inactivity compared with regular music lessons. In addition, children spent more time in moderate-to-vigorous physical activities.

Similar results were obtained by Hart et al. (2008), who implemented the TAKE 10! intervention programme in schools. This is a school-based physical activity programme that combines academic instruction with 10-minute physical activity breaks to get children moving without sacrificing time for academic learning. The authors found that children in the experimental group who participated in the TAKE 10! intervention programme, on average, exercised more each day. Unfortunately, the study did not find changes in individual phenotypes of physical activity intensity. However, we can assume that physical inactivity also decreased.

We found large effect sizes with very high relative changes and believe that any physical activity measure implemented at the most appropriate time (time of least physical activity) would have large effects. To support this, several studies report daily variability in children's physical activity (Brasholt et al., 2013; Hesketh et al., 2015; Mota et al., 2003; Olesen et al., 2014; Riddoch et al., 2007; Verbestel et al., 2011). Most

studies report that children are least physically active in the morning, during school hours (Hardman et al., 2009; Hesketh et al., 2014; Volmut, 2014). Integrating the physical activity intervention programme into the classroom during the time with the least amount and intensity of physical activity would have the greatest effect on increasing the amount and intensity of physical activity (Volmut, 2014). Volmut (2014) finds that younger Slovenian children have the lowest amount of physical activity in the morning and therefore the morning time is best for integrating intervention programmes. Similar findings are also reported by Hesket et al. (2014).

Nowadays, children spend most of their day at school (Hauptman and Komotar, 2010), where most of them are physically inactive. This is the reason why some countries have introduced physical activity breaks or interventions during class time. There are quite a few studies that implement intervention programmes aimed at increasing moderate-to-vigorous physical activity during physical education classes (McKenzie and Lounsbery, 2013; Powell et al., 2016). On the other hand, there are some studies (Bartholomew et al., 2019; Goh et al., 2016; Hart et al., 2008; Honas et al., 2008; Innerd et al., 2019; Mahar, 2011; Martin and Murtagh, 2017; Stewart et al., 2004) that integrate physical activity breaks or interventions into other school lessons where it is not common. The overarching goal is to reduce children's inactivity during school hours. We see an exceptional opportunity in pursuing this goal in the interdisciplinary integration of physical activity and subjects not normally taught through physical activity. In modern education, teachers should strive to eliminate the fragmentation of school work and modernize the way of teaching to optimize the learning process (Birsa, 2018). Retar and Lepičnik Vodopivec (2017, p. 24) note that teachers are aware of the importance of creativity and innovation as an important factor in teaching with movement. Therefore, we included new teaching methods through movement in music lessons. We also wanted to investigate whether the inclusion of a physical intervention programme would help to reduce physical inactivity. The school subjects of music and physical education have many similarities, as children can create a rhythm through physical activity that can be the basis for their first dance steps. We decided to combine music and physical education lessons because these two subjects are closely related and children can relax through such activities. Jelovčan et al. (2020, p. 30) report that preschoolers are more likely to express their knowledge of fairy-tale content both emotionally and physically through moving in the rhythm of music at different paces.

During school lessons which usually do not include physical activity, it is sometimes difficult to incorporate physical activities. However, we can incorporate physical activities into the lesson as a short break, for example, during the introductory phase, during the consolidation in the main part of the lesson, or during the final phase of the lesson. In order to incorporate physical activities into the lesson, the teacher must be well organized and prepared. By incorporating physical activities into the classroom, we help to achieve the recommended minimum daily physical activity levels and reduce inactivity among children and youth.

The Centre for Disease Control and Preventions study (Rasberry et al., 2010) lists several studies that have been conducted by incorporating physical activity into the school curriculum. The research they have conducted has shown that incorporating physical activities into the classroom not only leads to children being more physically active, but also leads to children memorizing and learning a certain subject matter more

easily and quickly, while at the same time making that knowledge more lasting. We must emphasize that the results of the above-mentioned intervention studies show an increase in children's physical activity (Bartholomew et al., 2019; Daly-Smith et al., 2018; Donnelly et al., 2017; Innerd et al., 2019; Mahar et al., 2006; Stewart et al., 2004; Vetter et al., 2020); in their attention span and concentration in relation to the subject matter (Howie et al., 2015; Ma et al., 2015); in learning effectiveness (Bartholomew et al., 2019; Mahar et al., 2006; Szabo-Reed et al., 2017); and consequently better learning performance (Daly-Smith et al., 2018; Have et al., 2016; Howie et al., 2015; Szabo-Reed et al., 2017).

Even before developing the physical activity intervention programme, we were aware that all of the physical inactivity during music lessons could not be fully converted into moderate-to-vigorous physical activity time. It is much easier if we replace the periods of physical inactivity with low-intensity physical activities (Treuth et al., 2005). Van der Ploeg et al. (2012) found that the risk of death was 2 % higher for people who sat for 4 to 8 hours per day, 15 % higher for 8 to 11 hours of sitting per day, and as much as 40 % higher for > 11 hours of sitting per day. Chau et al. (2015) and Pavey et al. (2015) report a slightly higher percentage increase in mortality with hours of sitting. In addition to hours of physical inactivity per day, uninterrupted sitting is a completely independent factor in mortality. The currently available prospective experimental studies support that interrupting sitting time (e.g., every 30 minutes for 2 minutes) and replacing it with light ambulatory physical activity or simple standing may be a sufficient stimulus to induce favourable changes in postprandial metabolic parameters (Benatti and Ried-Larsen, 2015). In this context, most epidemiological evidence suggests that independent moderate-to-vigorous physical activity is beneficial and that prolonged sitting is still associated with higher CVD and all-cause mortality risk (Matthews et al., 2012; Wijndaele et al., 2014). Accordingly, the findings of Peddie et al. (2013) and Duvivier et al. (2013) suggest that one round of moderate-to-vigorous physical activity cannot offset the deleterious effects of prolonged sitting throughout the day and support the importance of constant interruptions to this sedentary behaviour, even during low-intensity activities.

Some studies even report that additional low-intensity physical activity in children contributes to total daily energy expenditure (Pate et al., 2008; Treuth et al., 2009).

The results of our study were mainly influenced by the selection of the musical didactic games, because there is no significant difference between the music lessons that included a low intensity of physical activity, but only in the music lessons with a moderate-to-vigorous intensity of physical activity. The games consisted of various forms of making music to the rhythm of the music. The music lessons without physical activity consisted of didactic games with music, in which the children followed the rhythm of the music while sitting and clapping or snapping their fingers. In contrast, the lessons with an additional intervention included physical activities in which the children moved to the rhythm mainly while standing, namely by stamping their feet, jumping, or walking. These movements are considered low-intensity, or mostly moderate-to-vigorous physical activity (Volmut, 2014). We found that the greatest attention was paid to the selection of physical activities to illustrate the rhythm during the musical didactic games. The children who were included in the intervention programme in this way had more opportunities to engage in moderate-to-vigorous physical activity. In addition,

the games in the first music lesson provided much more entertainment for the children. Nevertheless, we believe that the goals of both music lessons were equally achieved.

One of the dangers of integrating physical activity into school subjects that are not based on physical activity is that the goals of one or both subjects can become unclear or even unrealistic, which is why we have encountered the question of what is the right level of physical activity in music lessons? At the same time, we must not forget that we must achieve the goals we have set for both subjects: music and physical education. The children tended to be lively and relaxed in the music lessons that included physical activities. They experienced some problems in listening to the instructions. Since assessing the acquired knowledge is not the goal of our research, we suggest that future studies pay more attention to that as well.

The disadvantage of our study is that the children were equipped with the accelerometer only during two music lessons. We would have obtained more reliable and useful data if the children had been equipped with an accelerometer for at least five consecutive school days. This would allow us to see how and to what extent the intervention programme during music lessons and in other school subjects helped to increase the total daily amount and intensity of physical activity and decrease physical inactivity.

A limitation of our study is the time of physical activity assessment, which would be longer if more music lessons were integrated into this time. In addition, we should strictly monitor whether children achieve the goals of music lessons. We also recommend including children of different ages in the study. In this way, the sample of children would be much larger, and the results could be more broadly generalized.

5 Conclusions

We have provided evidence that physically active learning (in our case, of music) contributes greatly to physical activity; specifically, it decreases physical inactivity and increases moderate-to-vigorous physical activity. There is very little research of this type, and although we have demonstrated very large effects of PAML, we believe it would be even more interesting to conduct a study that incorporates physically active learning in all the lessons that do not normally involve physical activity. The rest of the time spent in school should also include physical activities. This type of instruction requires much more preparation time for the lesson plan and is more difficult to implement. Our results suggest that the children achieved a substantial amount (17.2 minutes) of the daily recommendations for moderate-to-vigorous physical activity (60 minutes) with just one physically active lesson. We believe that effective physical activity intervention programmes or classroom physical activity can reduce children's daily level of physical inactivity during the school day.

Dr. Barbara Kopačin, Petra Ovčjak, dr. Tadeja Volmut

Učinkovitost vključevanja gibalne aktivnosti v pouk glasbene umetnosti

Pri izvajanju medpredmetne povezave imata lahko predmeta različno vlogo. Lahko je nosilna, poudarjena ali podporna, in sicer ne glede na izbrano strategijo povezovanja. Nosilno vlogo ima tisto predmetno področje, iz katerega izhajajo povezave. Podporno ima tisto, ki prispeva k doseganju skupnega cilja, poudarjeno pa tisto predmetno področje, ki dosega lastne predmetne cilje in bistveno vpliva na uresničitev skupnega cilja. Predvsem v nižjih razredih osnovne šole je zaradi nepojmovnega povezovanja in nepoznavanja učnih načrtov umetniških predmetnih področij v praksi zaznati nejasnosti pri načrtovanju in izvajanju povezav (Kopačin in Birsa, 2022, str. 110).

Gibalna/športna aktivnost je v otroštvu pomemben del zdravega življenjskega sloga. Redna in dovolj intenzivna gibalna/športna aktivnost ugodno vpliva na celostni razvoj otroka, ohranjanje in varovanje zdravja ljudi (NICE, 2007) ter zmanjša tveganje za številne kronične nenalezljive bolezni (Kriska idr., 2003). Odsotnost ali pomanjkanje gibalne/športne aktivnosti v obdobju otroštva lahko prispeva k razvoju kroničnih nenalezljivih bolezni, prekomerni telesni masi in debelosti otrok (Sardinha idr., 2008). Vsakodnevna gibalna/športna aktivnost v različnih oblikah je nenazadnje pomembna tudi za ohranjanje potrebne ravni gibalnih sposobnosti in spretnosti ter oblikovanje vedenjskih vzorcev, ki zagotavljajo redno gibalno/športno aktivnost v vseh življenjskih obdobjih.

Vzgojno-izobraževalne ustanove imajo osrednjo vlogo pri spodbujanju in razvijanju zdravega načina življenja ter ukvarjanju z vsakodnevno gibalno/športno aktivnostjo otrok (Hatfield in Chomitz, 2015). Otroci so v času šolskega pouka, ki traja od pet do devet ur na dan (Hauptman in Komotar, 2010), lahko deležni gibalne/športne aktivnosti pri predmetu šport, med rekreativnim odmorom in v času podaljšanega bivanja. Gibalno/športno aktivnost lahko povečamo tudi z gibalnimi igrami na prostem v času šolskega pouka, s katerimi prispevamo tudi k razvojnemu vidiku igranja na prostem (Ceciliani in Bortolotti, 2013). Poleg tega ure pouka, ki niso gibalne narave, dajejo izjemno priložnost, da mednje vključujemo gibanje in tako zmanjšamo gibalno neaktivnost med šolskim poukom. Pri tem pa moramo paziti, da pri vključevanju gibanja v pouk namenimo prednost doseganju ciljev predmeta, ki ni gibalne narave.

Med šolske predmete, ki niso gibalne narave, je težko vključevati gibalno aktivnost ves čas. Zato lahko v učne ure, ki niso gibalne narave, vključimo gibalno aktivnost le v nekaterih učnih urah ali delih učne ure za krajši čas, na primer: v uvodni motivaciji, pri utrjevanju v glavnem delu učne ure ali v zaključnem delu učne ure. Vključevanje gibalne aktivnosti v celotno učno uro, ki ni gibalne narave, zahteva dobro načrtovanje, organiziranost in izvedbo učne ure. Z vključevanjem gibalne aktivnosti v celotno učno uro, ki ni gibalne narave, pripomoremo k doseganju priporočil minimalne dnevne gibalne/športne aktivnosti in s tem k zmanjšanju gibalne neaktivnosti otrok in mladostnikov. Zato je namen našega prispevka, da s pomočjo merilnika pospeška izmerimo količino in intenzivnost posameznih fenotipov gibalne/športne aktivnosti prvošolcev le med uro glasbene umetnosti brez gibalne intervencije in z njo.

V raziskavo je bilo vključenih 108 otrok (50 dečkov), starih šest in sedem let, iz dveh slovenskih obalnih osnovnih šol. Vzorec udeležencev je bil neslučajnostni in priložnostni. Vsi otroci so bili vključeni v dve učni uri glasbene umetnosti, kjer so preko glasbenih didaktičnih iger utrjevali in razvijali ritmični posluh. V eno učno uro glasbene umetnosti, ki je bila izvedena v prvem tednu, so bile vključene glasbene didaktične igre z gibanjem, v drugi uri, ki je bila izvedena v drugem tednu raziskave, pa gibanja ni bilo. Pri obeh urah smo si zastavili iste učne cilje.

Otrokom smo med obema urama glasbene umetnosti s pomočjo merilnika pospeška MTI Actigraph (Manufacturing Technology Inc, Fort Walton Beach, FL, USA) izmerili količino in intenzivnost gibanja ter izračunali čas, preživet v vsakem fenotipu intenzivnosti gibalne/športne aktivnosti. Pred pričetkom učne ure smo otrokom pripeli merilnike pospeška okoli pasu s pomočjo elastičnega traku tako, da so bili na desnem boku. Po koncu ure smo jih pobrali in podatke prenesli na osebni računalnik za nadaljnje analize. Zabeležili smo si čas trajanja ur. V obdelavo smo vzeli podatke za vsakih 15 sekund (15-sekundni časovni interval – epoha). S Kolmogorov-Smirnovim testom smo preverili normalnost porazdelitve. Za normalno porazdeljene podatke smo uporabili parametrični t-test za odvisne vzorce, za nenormalno porazdeljene podatke pa neparametrični Mann-Whithneyjev test. Odločali smo se pri stopnji tveganja 0,05. V primeru ugotovljenih razlik smo zabeležili tudi Cohenov d.

Vsi otroci, vključeni v raziskavo, so bili deležni dveh ur glasbene umetnosti z istimi učnimi cilji. V prvem tednu so bili otroci med urami glasbene umetnosti s pomočjo glasbenih didaktičnih iger (glasbeni klobuk, telefončki, skriti zaklad, kako mi je ime, zvonček, kateri instrument slišim in kdo te je poklical) deležni običajne učne ure, pri kateri je prevladovala predvsem gibalna neaktivnost. Pri drugi učni uri glasbene umetnosti so tudi s pomočjo glasbenih didaktičnih iger (hoja okoli stolov, ritmično skakanje, pajaci, gibanje v različnih smereh, ledeni možje, ptički v gnezda in vlak) razvijali in utrjevali ritmični posluh.

Pri igrah, ki smo jih za namen raziskave pripravili sami, so bili otroci večji del ure gibalno aktivni, saj so v ritmu hodili, tekali, poskakovali in korakali. Pri prvi glasbeni didaktični igri na travniku so si otroci izbrali svoj prostor v učilnici. Povedali smo jim, da bodo oponašali živali (metulje, žabe, medvede) le z gibi. Ko smo zaigrali na ropotuljo, so si otroci predstavljali let metuljev. Ko so zaslišali strgalo, so otroci oponašali skoke žab, ko pa so zaslišali boben, so ponazarjali medvedjo hojo. Pri glasbeni didaktični igri ples okoli stolov smo v krog postavili en stol manj, kot je bilo otrok. Predvajali smo glasbo, ob kateri so se otroci gibalno izražali, in ko je glasba utihnila, so se otroci morali usesti na najbližji stol. Tisti, ki je ostal brez stola, je moral narediti 10 skokov s pritegom kolen k prsim in se nato vrniti nazaj v igro. Ob zadnjem poskusu smo umaknili iz igre pet stolov. Ob glasbeni didaktični igri ritmično skakanje smo z otroki stali v krogu. S poskoki smo predstavili en ritmični vzorec, ki so ga otroci ponovili. Z izštevanjem ob korakanju smo določili otroka, ki je s poskoki predstavil svoj ritmični vzorec. Pri predzadnji glasbeni didaktični igri smo vstopili v svet pajackov, kjer je pajacek Nacek dobil nov boben, na katerega je igral dan in noč. Da pa ne bi zbudil spečih ljudi, je ponoči bobnal čisto tiho. Otroci so v vlogi pajackov dobro prisluhnili bobnanju in ugotavljali, ali je noč ali je dan. Ko je učitelj bobnal tiho, je bila noč in vsi pajacki so čisto počasi prestopali z leve noge na desno. Ko je učitelj bobnal glasno, je bil dan in pajacki so se zbudili, skakali, tekali – počeli vse tisto, kar pač pajacki znajo.

Pri glasbeni didaktični igri gibanje v različnih smereh je učitelj igral na tri instrumente: palčke, ropotuljo ali triangel. Otroci so se gibali po vnaprej določenih gibih za določen zvok instrumenta. Prepoznavanje zvokov so izrazili z gibanjem po prostoru v različnih smereh. Ob zvoku bobna so korakali naprej, ob zvoku palčk hodili vzvratno, ob zvoku triangla pa so se vrteli okoli svoje osi. Pri glasbeni didaktični igri ledeni možje pa smo otrokom predvajali živahno glasbo, ob kateri so se gibalno izražali. Ob nenadni prekinitvi glasbe pa so otroci "zamrznili" v položaju, v katerem so obstali. Nihče se ni smel premakniti, dokler znova niso zaslišali predvajane glasbe.

Ugotovili smo, da obstajajo razlike med povprečnima vrednostma deleža časa gibalne neaktivnosti med običajno uro glasbene umetnosti in med uro glasbene umetnosti z intervencijskim programom ($p = 0{,}001$, $d = 12.0$). Delež povprečne vrednosti gibalne neaktivnosti med uro glasbene umetnosti se je zmanjšal s 63% na 24%. Rezultati tudi kažejo, da obstajajo razlike med povprečnima vrednostma deleža časa srednje ($p = 0{,}001$, $d = 5.9$) in tudi visoke ($p = 0{,}001$, $d = 30.0$) intenzivnosti gibalne/športne aktivnosti med običajno uro glasbene umetnosti in med uro glasbene umetnosti z intervencijskim programom. Čas srednje intenzivnosti gibalne/športne aktivnosti med uro glasbene umetnosti z intervencijskim programom je daljši za 10,4 minute od časa srednje intenzivnosti gibalne/športne aktivnosti običajne učne ure glasbene umetnosti, medtem ko je čas visoke intenzivnosti gibalne/športne aktivnosti daljši za 6,7 minute. Posledično smo tudi ugotovili, da obstajajo razlike med povprečnima vrednostma časa srednje do visoke intenzivnosti gibalne/športne aktivnosti ($p = 0{,}001$, $d = 5{,}12$) ter da je čas srednje do visoke intenzivnosti gibalne/športne aktivnosti daljši kar za 17,2 minute.

V nadaljevanju nas je tudi zanimalo, ali se otrokom med uro glasbene umetnosti, v katero je vključen intervencijski program, zmanjša gibalna neaktivnost za vsaj 30%. Ugotovili smo, da so bili otroci med običajno uro glasbene umetnosti deležni kar 62,9-odstotnega deleža časa gibalne neaktivnosti, med uro glasbene umetnosti z gibalnim intervencijskim programom pa le 23,9-odstotnega.

Otroci danes preživijo večino dneva v šoli (Hauptman in Komotar, 2010), kjer so večji del časa gibalno neaktivni. Prav zato so v drugih državah začeli med poukom izvajati gibalne intervencijske programe. Obstaja kar nekaj študij o izvajanju intervencijskih programov, s katerimi želijo povečati čas srednje do visoke intenzivnosti gibalne/športne aktivnosti med učno uro športa (McKenzie in Lounsbery, 2013; Powell Woodfield in Nevill, 2016).

Zelo redke so študije (Hart idr., 2008), ki predstavljajo izvajanje intervencijskih programov med učnimi urami, ki niso gibalne narave in s pomočjo katerih se zmanjšuje gibalno neaktivnost otrok med šolskim poukom. Izjemno priložnost predstavlja ravno medpredmetno povezovanje predmeta šport in predmetov, ki niso gibalne narave. Učitelji bi si v sodobnem izobraževanju morali prizadevati za odpravo razdrobljenosti šolskega dela in posodobitev načina poučevanja ter s tem optimizacijo učnega procesa (Birsa, 2018).

Prav zato smo v ure glasbene umetnosti vključili nove načine poučevanja preko gibanja. Poleg tega smo želeli preučiti, ali z vključitvijo gibalnega intervencijskega programa pripomoremo k zmanjšanju gibalne neaktivnosti. Šolska predmeta glasbena umetnost in šport imata veliko skupnih točk (Drovenik Adamec, Blažič, Kovačič, 2020), saj lahko otroci s pomočjo gibalne/športne aktivnosti ustvarijo ritem, ki je lahko osnova

za prve plesne korake. Za vključevanje gibanja v ure glasbene umetnosti smo se odločili tudi zato, ker sta ta dva predmeta ves čas tesno povezana in sta predmeta, pri katerih se otroci lahko sprostijo.

Tovrstnih raziskav je izredno malo, zato menimo, da bi bilo smiselno v prihodnje izpeljati raziskavo, ki bi gibalno/športno aktivnost vključevala v vseh učnih urah, ki niso gibalne narave, ter med preostalim časom, ki ga otroci preživijo v šoli. Tovrsten način izvedbe šolskega pouka zahteva veliko več časa za pripravo na pouk ter večjo zahtevnost pri izpeljavi pouka. Smiselno bi bilo, da otroci nosijo merilnik pospeška več dni zapored, saj bi le tako dobili zanesljivejše rezultate. Le z nadaljnjim tovrstnim raziskovanjem lahko ugotovimo, ali so intervencijski programi med učnimi urami, ki niso gibalne narave, učinkoviti. Prepričani smo, da z učinkovitimi intervencijskimi programi lahko zmanjšamo dnevno raven gibalne neaktivnosti otrok v času šolskega pouka ter povečamo čas dnevnega trajanja v nizki, srednji in visoki intenzivnosti.

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Interplay of Personality, Self-Efficacy and Willingness to Communicate

Prejeto 29. 12. 2022 / Sprejeto 8. 5. 2023

Znanstveni članek

UDK 316.77:811.111'271

KLJUČNE BESEDE: samoučinkovitost, pripravljenost za komuniciranje, osebnostne lastnosti, angleški jezik

POVZETEK – Raziskava ugotavlja, kako osebnostne lastnosti in jezikovna samoučinkovitost vplivajo na pripravljenost za komunikaciranje pri učenju angleškega jezika. Vzorec vključuje 216 študentov Univerze v Novem Sadu, uporabljene pa so bile tri metode: vprašalnik Velikih pet plus dva, vprašalnik Pripravljenost za komuniciranje in Vprašalnik samoučinkovitosti pri učenju angleškega jezika. Študenti so pokazali samoučinkovitost na ravni malo višji od nadpovprečne in bili so pripravljeni govoriti na ravni nekoliko višji od zmerne. Samoučinkovitost in pripravljenost za komuniciranje sta v pozitivni korelaciji. Ekstravertnost in pozitivna valenca zelo povečata pripravljenost za komuniciranje. Pozitivna valenca in odprtost za izkušnje sta pomembni lastnosti v odnosu do samoučinkovitosti. Spol ne vpliva neposredno na pripravljenost za komuniciranje in samoučinkovitost, vendar pa blaži odnos z vestnostjo, odprtostjo za izkušnje, ekstravertnostjo in negativno valenco. Ekstravertnost, vestnost in odprtost za izkušnje so značilno večje pri ženskah, za moške pa je značilno večja negativna valenca. Poleg tega so predlagane tudi nekatere sorodne pedagoške vsebine.

Received 29. 12. 2022 / Accepted 8. 5. 2023

Scientific paper

UDC 316.77:811.111'271

KEYWORDS: self-efficacy, willingness to communicate, personality traits, English

ABSTRACT – This research examines how Willingness to Communicate (WTC) in learning English is conditioned by personality traits and linguistic self-efficacy. The sample consists of 216 students at the University of Novi Sad. Three instruments were used: the Big Five Plus Two questionnaire, the Willingness to Communicate Questionnaire, and the Questionnaire of English Self-Efficacy. Students showed self-efficacy at a slightly above-average level and were willing to speak at a slightly higher than moderate level. Self-efficacy and WTC are in positive correlation. Extraversion and Positive valence contribute significantly to WTC. Positive valence and Openness to experience are significant traits in relation to self-efficacy. Females have higher Extraversion, Conscientiousness and Openness to experience, whereas males have higher Negative valence. Gender has no direct effect on WTC and self-efficacy, but moderates the relationship with Conscientiousness, Openness to experience, Extraversion, and Negative valence. Females have higher Extraversion, Conscientiousness and Openness to experience, while males have higher Negative valence. In addition, some pedagogical implications are proposed.

1 Introduction

Nowadays, Business English (BE) is widely used worldwide, and it has evolved into a means of becoming successful or getting outstanding outcomes in doing business on a global scale, elevating learners in terms of social class. Due to this perception, a lot of people attempt to study it, but not all of them are successful in progressing to higher levels of skill. Despite having similar starting points, some people find it easy to communicate in English, while others find it challenging. According to MacIntyre and Charos (1996), communication is a goal rather than a tool to aid in language acquisition.

Today, English for Specific Purposes (ESP) recognizes that university students need to be able to communicate in ways that go beyond being good at language and avoid-

ing making language mistakes. ESP therefore does not see students' writing problems as a language problem that can be fixed with a few language classes, but rather as their attempts to learn a new way of writing and, more specifically, a new way of communicating. This shifts the focus of language instruction from isolated written or spoken texts to contextualized communicative genres, with a growing emphasis on identifying strategies that are appropriate for both native and non-native speakers of the target language (Hyland, 2022). Thus, teaching entails a commitment to genuine communication, learner-centredness, and, where possible, close collaboration with subject specialists (Danko and Klun, 2014). Unfortunately, classroom methods are not at the centre of ESP discussions nowadays, and the literature should pay more attention to them than it does now (Hyland, 2022).

Personal differences in the relationship between meta-cognition and didactic instructions point out that it is the student who elaborates, integrates and learns, and does all this through their own system of thinking and the techniques with which they monitor and direct their own cognition. Therefore, the choice of how to teach should be made on an individual basis. This is due to the reason that organizing facts through meta-cognition should help students to develop better thinking, a process that is unique to each individual and can be improved more easily with the assistance of ESP teachers (Gojkov Rajić et al., 2021). ESP teachers should be aware that the pursuit of a goal is determined by an individual's self-efficacy beliefs, and that people engage in activities in which they believe they can be effective. Students need to learn how to learn on their own and have confidence in their own abilities. Thus, self-efficacy is closely related to self-regulation and enables students to govern and guide their activities. It is a process aimed at achieving goals set by the individual over time and in changing contexts.

The aim of this research is to examine how certain personality traits affect Willingness to Communicate (WTC) and self-efficacy in BE. The investigation will be carried out using the "Big Five Plus Two" model, i.e., a suggested taxonomy for personality traits developed in psychological trait theory.

The following research questions are stated in the paper:

- What is the students' degree of WTC in BE?
- What is the students' degree of self-efficacy in BE?
- Is there a positive correlation between personality traits and WTC?
- What is the relationship between personality traits and self-efficacy in BE?
- Does gender moderate the relationship between personality traits and WTC?
- Does gender moderate the relationship between personality traits and self-efficacy in BE?

On the basis of the above questions, the following hypotheses are examined:

- H1. *Openness to experience* has a statistically significant impact on WTC in BE.
- H2. *Openness to experience* contributes statistically significantly to self-efficacy in BE.
- H3. Self-efficacy in BE statistically significantly contributes to WTC.
- H4. There is a statistically significant correlation between gender and personality traits in BE.
- H5. Gender has a statistically significant influence on WTC and self-efficacy in BE.

So far, the relationship between a student's personality, self-efficacy, and WTC in BE has received insufficient attention, although it is very important due to the personalized approach to ESP learning and the need to develop self-regulated learning that includes self-efficacy. Bandura (1986, 1995) believes that self-efficacy functions as a regulator in self-regulated learning and occurs when students attempt to achieve the desired results and avoid the undesirable ones.

2 Literature review

The Willingness to Communicate (WTC) model (MacIntyre et al., 1998) describes the factors influencing the capacity to communicate in English, and demonstrates why some people are more enthusiastic about using English than others. Numerous studies which examined WTC in French were carried out in the unique setting of a linguistically divided Canada. These empirical studies focused on issues such as the role of circumstances (Baker and MacIntyre, 2003), orientations in L2 learning (MacIntyre et al., 2001), students' gender and age (MacIntyre et al., 2003), and the vitality and norms of ethnolinguistic communities (Clément et al., 2003).

The studies by Yashima (2002), Yashima et al. (2004), and Peng (2014) focused on WTC in English in the Asian context, which differs significantly from the circumstances in the studies mentioned above because there are few opportunities for interactions with native speakers. As a result, they introduced the concept of international posture (IP), i.e., "an openness and favourable disposition towards other languages and cultures, an interest in foreign affairs, and a non-ethnocentric outlook on life" (Yashima, 2002, p. 57). This concept includes a desire to engage with people from different cultures, a desire to work or study abroad, and an interest in international issues. Yashima (2009) demonstrated that high IP levels result in higher WTC. The results of research (Baker and MacIntyre, 2003; MacIntyre et al., 2011) that evaluated factors causing WTC among immersion and non-immersion students, clearly display the importance of context. According to other authors (Yashima, 2012), anxiety is the single best predictor of WTC, which is similar to immersion scenarios. However, Čepon (2015) argued that students predominantly use negative strategies to reduce anxiety on a personal and interpersonal level.

The various conceptualizations of WTC in L2, ranging from a personality trait to a circumstance-related feature, reveal the complexity and significance of this concept because it combines psychological, linguistic, pedagogical, and communicative aspects. Recently, the dynamic nature of WTC has come to light, and it has been demonstrated that one's WTC may change throughout a single communication event (Pawlak and Mystkowska-Wiertelak, 2015). In their research, Pawlak and Mystkowska-Wiertelak (2015) noted that it looked reasonable to claim that giving discussion activities too many rigorous restrictions would prove detrimental. The conversation starters provided to assist participants in having a productive conversation appeared to be insufficient. When students began to discuss their own experiences, the conversation became more animated.

It was also noted (Trinder, 2013) that the majority of business students at the Vienna University of Economics and Business possess a few basic concepts of learning and self-perceptions, which in turn affect their learning behaviours and assessments of the learning environment. With ratings even higher for the group of advanced students, the quantitative data revealed high levels of ambiguity tolerance and WTC among the sample, as well as preferences for instructional approaches that cater to a communicative learning style. The interviews and open-ended questions corroborated the results where examinees listed extraversion and the readiness to strike up discussions as crucial characteristics of a successful language learner.

To the best of our knowledge, only a few studies have focused on L2 WTC within an ESP context. Thus, willingness to read was explored among students of the humanities and students of the sciences learning ESP (Knežević and Halupka-Rešetar, 2015). Another study offers an insight into students' WTC in the Serbian context and confirms the predominance of self-perceived competence as a crucial factor for L2 WTC (Halupka-Rešetar et al., 2018). Šafranj and Katić (2019) investigated ESP engineering students' WTC. Their findings revealed a significant positive correlation between WTC and the Big Five personality traits. The results suggest that there is a low correlation between WTC and *Conscientiousness*, *Emotional stability* and *Agreeableness*, but a moderate-to-high correlation between WTC and *Extraversion* and *Openness to experience*.

Self-efficacy has been defined in the literature as the perceived competence of an individual to control the process in order to achieve a goal (Bandura, 1995). According to Zhang et al. (2020), instructionally capitalizing on self-efficacy offers a potentially strong tool to enhance learning ESP, but this first calls for a deeper understanding of the variables that influence the growth of self-efficacy. Participants identified teacher feedback as the most powerful factor influencing ESP self-efficacy and performance (Zhang et al., 2020). Teachers should provide students with ongoing, personalized evaluations in a consistent manner and should determine the most efficient feedback types (constructive, positive), sources (teachers, peers), modes (written, oral), and timings (immediate, delayed) that would work for their students.

According to other studies (MacIntyre et al., 1999; MacIntyre and Charos, 1996), there is a strong correlation between learner's personality and WTC. The personality traits of *Emotional stability* and *Extraversion/Introversion* were connected to WTC through perceived language proficiency and anxiety during conversation (MacIntyre et al., 2011). While communication anxiety, language proficiency, and motivation are associated with WTC through the personality traits of *Emotional stability*, *Extraversion*, *Openness to experience*, and *Conscientiousness*, the personality trait of *Agreeableness* is directly associated with WTC (MacIntyre and Charos, 1996).

A different study (Šafranj and Katić, 2019) concludes that there is a substantial number of students with low WTC in ESP (37%), in addition to the average level of WTC in ESP (48%). A slightly lower number (15%) of students reported having high WTC in ESP. These findings are consistent with those of Knežević and Halupka-Rešetar (2015), who discovered that students of the humanities are more willing to read than their counterparts in the sciences. The obtained results are somewhat in line with the findings (Öz, 2014) according to which students majoring in EFL achieved a satisfactory level of WTC and showed motivational orientation toward peers. These results are also in line with the study by Halupka-Rešetar et al. (2018), which found that the mo-

tivational orientation of friendship had statistically significant correlations with WTC inside and outside the classroom. However, their results differ from those of another study (Pavičić Takač and Požega, 2011) according to which students would rather talk to strangers than friends and acquaintances. This result shows that students are reluctant to speak with their teachers, friends, and other people in person.

A prior study (Adelifar et al., 2016) found a direct and negative correlation between WTC and *Agreeableness* in EFL, while there was no connection between *Extraversion* and the students' WTC. Additionally, it was reported that there was a direct and negative correlation between *Conscientiousness* and WTC in EFL. This relationship may be explained by the fact that people who are conscientious also tend to be responsible and work hard to achieve success. The same study found a direct and negative correlation between *Neuroticism* and WTC showing that low emotional stability causes people to react emotionally and be more receptive.

According to another study (Öz, 2014), *Extraversion* and *Openness to experience* were the best predictors of WTC in EFL, supporting the findings that students who exhibit traits like curiosity, sociability, creativity, person-orientation, talkativeness, and friendliness are more likely to communicate in L2. Similar to this, people who are trustworthy, kind, honest, and helpful also exhibit a greater propensity toward WTC in EFL. These results are in contrast with the above-mentioned study (Adelifar et al., 2016) demonstrating that *Extraversion* and *Openness to experience* have no influence on students' WTC. The risk-taking propensity of extraverts appears to extend to their linguistic behaviour, such as their increased use of slang words (Dewaele and Regan, 2001) and their willingness to engage in potentially unsafe emotional interactions (Dewaele and Pavlenko, 2002).

In a study of Flemish secondary school students, *Neuroticism* was found to be unrelated to the students' foreign language attitudes and foreign language marks (Dewaele, 2007). In a previous study (Dewaele, 2002) using the same sample of students, however, it was noted that students were more likely to experience more Foreign Language Anxiety (FLA) in their English L3 language. In addition, Dewaele (2012) found that the relationship between *Neuroticism* and FLA was stronger in the L2, L3, and L4 of Spanish and British university students. Dewaele and Wei (2012) also noted that people who speak more languages and have lived abroad are more tolerant of ambiguity.

The gender variable was investigated in the research related to issues of non-cognitive factors in L2 learning, such as motivation, self-confidence, learning strategy, metacognition, and affective styles (Donovan and MacIntyre, 2004; Dörnyei, 2005; Gojkov Rajić et al., 2021; Kleitman and Stankov, 2007; You et al., 2016). Since the results of the previous study were inconsistent, it should be further investigated how gender affects the relationship between personality traits and WTC, as well as the relationship between personality traits and self-efficacy.

3 Methods

Participants

Convenience sampling was used to recruit participants – 216 students from the Faculty of Technical Sciences, University of Novi Sad, of whom 115 (53.2%) were females and 101 (46.8%) males, aged 18 to 26 (M = 23.50, SD = 1.97). Their years of learning English as a foreign language ranged from 8 to 17 (M = 11.16, SD = 3.37). The study was carried out during the 2021/22 academic year. At the time of the research all of the students were enrolled in a BE mandatory course in their second year of studies, with four 45-minute classes per week. The teaching material was based on authentic materials and activities focusing on the integrated four language skills and a number of sub-skills relevant to BE. Before the beginning of the course, the participants' level of proficiency in English had been determined using the Oxford Quick Placement Test (Oxford University Press, 2001); according to the CEFR (Council of Europe, 2001), their English proficiency was at B2 level.

Instruments

Three questionnaires were used to collect data for this study: the *Big Five Plus Two*, *abbreviated version* (Čolović et al., 2014), *Willingness to Communicate Questionnaire* – WTC (McCroskey, 1992) and the *Questionnaire of English Self-Efficacy* – QESE (Kim et al., 2015).

The *Big Five Plus* Two questionnaire assesses the big seven personality traits, and each trait was measured through 10 items on a five-point Likert scale (1 – do not agree to 5 – completely agree). The reliabilities of the scales measured by Cronbach's alpha were the following: *Extraversion* $\alpha = 0.87$, *Neuroticism* $\alpha = 0.86$, *Openness to experience* $\alpha = 0.77$, *Aggressiveness* $\alpha = 0.85$, *Conscientiousness* $\alpha = 0.89$, *Positive valence* $\alpha = 0.89$ and *Negative valence* $\alpha = 0.85$. The reliability values of the scales ranged from satisfactory to excellent.

The Big Five Plus Two questionnaire was created on the basis of studies of Serbian culture and indicates that *Aggressiveness* is a trait that is characteristic of Serbian culture and, in the system of dimensions, it is used instead of the *Agreeableness* dimension obtained in the Big Five model (Goldberg, 2001). *Aggressiveness* in research most often achieves moderate negative correlations with *Agreeableness* from the Big Five model. Thus, they are similar dimensions and are often compared in research. The study (Čolović et al., 2014) shows the correlation between these two models. The authors decided on the seven-factor model because, in addition to the five dimensions that are similar in content to the dimensions of the Big Five model, they also include two self-evaluative dimensions: *Positive valence* and *Negative valence*. *Positive valence* includes indicators related to narcissistic tendencies and positive self-image, while *Negative valence* includes indicators related to manipulativeness and negative self-image.

The *Willingness to Communicate* – WTC (McCroskey, 1992) questionnaire presents participants with 20 hypothetical situations in which they have the option to communicate or not. Situations range from everyday situations, like talking to friends, to challenging situations, like delivering a speech. For each situation, the participants need to rate their willingness to communicate in a given setting on a scale of 0 to 100. The

communicative situations in this questionnaire closely resemble those used in BE oral communication. Cronbach's alpha reliability in the current sample was excellent (0.93).

The *Questionnaire of English Self-Efficacy* – QESE (Kim et al., 2015) consists of 32 items and uses a 7-point rating scale from 1 ("I cannot do it at all") to 7 ("I can do it very well"). It was designed to measure the following four areas:

- self-efficacy for listening (8 items);
- self-efficacy for speaking (8 items);
- self-efficacy for reading (8 items); and
- self-efficacy for writing (8 items).

The subscales measuring different language skills were extremely highly correlated, and it was redundant to use them separately because, in some analyses, they would violate the reliability of statistical procedures. They were combined into one general scale, and it is used as a general measure of self-efficacy. Cronbach's alpha reliability in the current sample was excellent (0.98).

The *Questionnaire of English Self-Efficacy* and *Willingness to Communicate* were translated into Serbian using an iterative process of repeated independent translation and blind back-translation. Minor differences in the choice of words and phrases were fixed to make sure that the Serbian items still communicated the same meaning as the original ones.

Data analysis

For easier interpretation and comparison, the average summation scores were calculated for all scales to reduce them to the instrument's answer scale. In order to assess the relationships between personality traits and self-efficacy in BE and WTC, the Pearson coefficient correlation was calculated. In order to clarify the results in a more systematic manner and assess the partial predictive influence of personality traits towards self-efficacy in BE and personality traits and self-efficacy in BE towards WTC, multiple regression models were run. Gender was added to both models as a predictor. The PROCESS macro for SPSS was used in order to check for possible moderators between personality traits and gender towards self-efficacy in BE and WTC.

4 Results

Descriptive statistics

Descriptive statistics of research variables are presented in Table 1. All research variables had values of skewness and kurtosis in the suggested range of ±2 (George and Mallery, 2010), indicating that there were no significant deviations from univariate normal distributions.

Table 1

Descriptive statistics of research variables

Variable	*Min*	*Max*	*Mean*	*SD*	*Sk*	*Ku*
Extraversion	1.30	5.00	3.70	0.73	–0.50	0.04
Neuroticism	1.00	4.40	2.26	0.79	0.44	–0.57
Aggressiveness	1.10	5.00	2.59	0.81	0.33	–0.42
Conscientiousness	1.30	5.00	3.59	0.82	–0.31	–0.44
Openness to experience	2.10	5.00	3.82	0.62	–0.27	–0.50
Positive valence	1.00	5.00	3.22	0.85	–0.20	–0.19
Negative valence	1.00	3.80	1.67	0.64	1.18	0.75
Self-efficacy in BE	2.34	7.00	5.94	1.18	–0.98	–0.10
WTC	1.85	100.00	58.30	22.51	0.05	–0.53

Note: Sk – skewness; Ku – kurtosis; WTC – Willingness to Communicate

Correlation

Pearson's correlation coefficient between personality traits, self-efficacy, and WTC is presented in Table 2.

Table 2

Correlations between personality traits, self-efficacy, willingness to communicate, and gender

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Extraversion (1)	1									
Neuroticism (2)	–0.34‡‡	1								
Aggressiveness (3)	0.05	0.47‡‡	1							
Conscientiousness (4)	0.45‡‡	–0.39‡‡	–0.12	1						
Openness to experience (5)	0.44‡‡	0.01	0.15*	0.32‡‡	1					
Positive valence (6)	0.56‡‡	–0.14*	0.27‡‡	0.34‡‡	0.51‡‡	1				
Negative valence (7)	–0.20‡‡	0.45‡‡	0.48‡‡	–0.39‡‡	–0.09	0.08	1			
Self-efficacy in BE (8)	–0.01	0.02	0.00	0.02	0.26‡‡	0.14*	–0.00	1		
WTC (9)	0.44‡‡	–0.15*	0.09	0.09	0.21‡‡	0.34‡‡	–0.03	0.06	1	
Gender (10)	0.21‡‡	0.02	0.08	0.23‡‡	0.23‡‡	0.11	–0.21‡‡	–0.00	0.03	1

Note: * $p < 0.05$; ‡‡ $p < 0.01$.

Self-efficacy in BE was positively correlated with *Openness to experience* and *Positive valence*, and these correlations were weak to moderate in intensity. WTC had significant positive correlations with *Extraversion*, *Openness to experience* and *Positive valence*, and a negative correlation with *Neuroticism*. The correlations ranged in strength from moderately weak in the case of *Neuroticism* to strong in the case of *Extraversion*. Gender was positively correlated with *Extraversion*, *Conscientiousness*, and *Openness to experience*, indicating that female participants on average had higher scores in comparison with male participants on these dimensions. Gender was negatively correlated with *Negative valence* indicating that male participants had higher scores on this dimension.

Multiple regression: self-efficacy prediction in BE

Multiple regression analysis with personality traits as predictors and self-efficacy in BE as a prediction criterion showed that personality traits significantly predicted the criterion, $F(8, 207) = 3.13$, $p = 0.002$, $R^2 = 0.11$. Personality traits explain around 11 % of the criterion variance, and partial contributions of predictors are presented in Table 3. There were two significant positive predictors: *Positive valence* and *Openness to experience*.

Table 3

Partial contributions of predictors for self-efficacy in BE

Predictors	*β*	*t*	*p*
Gender	–0.05	–0.65	0.519
Extraversion	–0.21	–2.36	0.019
Neuroticism	–0.02	–0.20	0.845
Aggressiveness	–0.05	–0.57	0.567
Conscientiousness	–0.03	–0.38	0.704
Openness to experience	0.32	3.90	0.000
Positive valence	0.13	1.41	0.161
Negative valence	–0.02	–0.22	0.826

Multiple regression: WTC prediction in BE

Multiple regression analysis with personality traits and self-efficacy in BE as predictors and WTC as the criterion showed that these traits significantly predicted the criterion, $F(9, 206) = 7.26$, $p < 0.001$, $R^2 = 0.24$. Personality traits explained almost 25 % of the criterion variance, and partial contributions of predictors are presented in Table 4. There were two significant predictors, *Extraversion* and *Positive valence*. *Extraversion* was a strong positive predictor, indicating that those with higher *Extraversion* are also more willing to communicate. On the other hand, *Conscientiousness* was a weak negative predictor. Self-efficacy in BE was a significant predictor of WTC, but gender was not a significant predictor in either model.

Table 4

Partial contributions of predictors for WTC

Predictors	*β*	*t*	*p*
Gender	–0.05	–0.69	0.489
Extraversion	0.44	5.16	0.000
Neuroticism	–0.06	–0.73	0.464
Aggressiveness	0.07	0.86	0.390
Conscientiousness	–0.17	–2.18	0.030
Openness to experience	–0.01	–0.17	0.868
Positive valence	0.13	1.51	0.132
Negative valence	–0.04	–0.55	0.585
Self-efficacy in BE	0.06	0.93	0.352

Moderation of personality traits and gender towards self-efficacy in BE

Out of the seven tested moderations, two were significant. Adding interaction terms for gender and personality traits did not significantly improve the model predicting self--efficacy in BE for the following traits:

- *Neuroticism*, $F(1, 212) = 0.14$, $p > 0.05$;
- *Aggressiveness*, $F(1, 212) = 0.61$, $p > 0.05$;
- *Openness to experience*, $F(1, 212) = 0.01$, $p > 0.05$;
- *Positive valence*, $F(1, 212) = 1.15$, $p > 0.05$;
- *Negative valence*, $F(1, 212) = 0.04$, $p > 0.05$.

Adding an interaction term significantly improved the model when the predictors were *Extraversion*, $F(1, 212) = 7.34$, $p = 0.007$, and *Conscientiousness*, $F(1, 212) = 4.10$, $p = 0.044$.

For better understanding the interactions are presented in figures. Thus, Figure 1 depicts the interaction of *Extraversion* and gender. At low levels of *Extraversion* male participants exhibit higher self-efficacy in BE, while their female counterparts show lower self-efficacy in BE. Self-efficacy in BE is very similar to the mean levels of *Extraversion*; at high levels of *Extraversion* the pattern is reversed compared to low levels, with female participants having higher self-efficacy in BE compared to their male counterparts. The pattern is very similar for the interaction of *Conscientiousness* and gender. Male participants tend toward lower self-efficacy in BE at higher levels of *Conscientiousness*, whereas female participants tend in the opposite direction. This is presented in Figure 2.

Figure 1

Moderation between Extraversion and gender

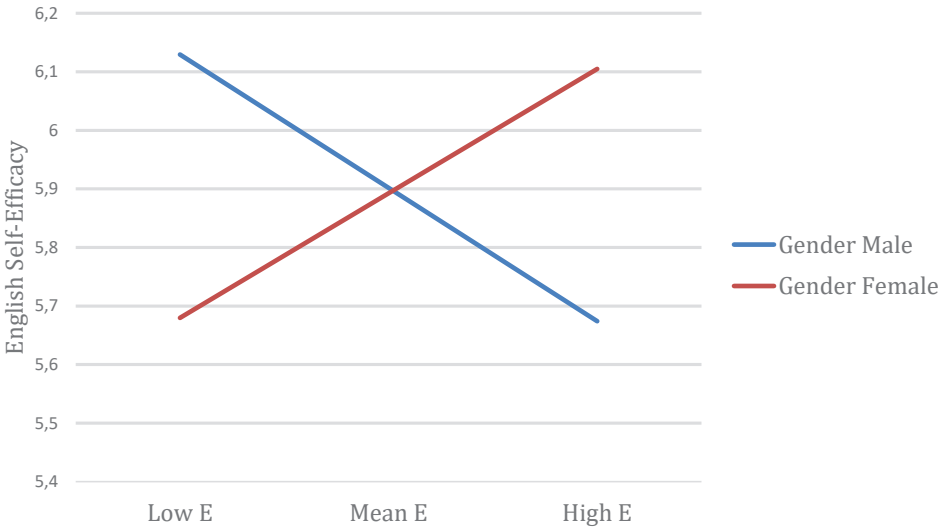
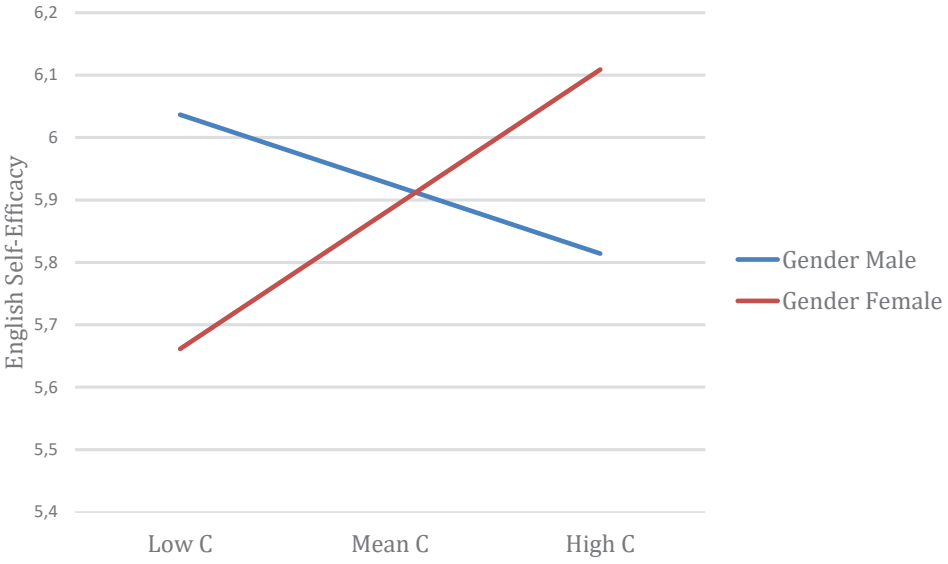


Figure 2

Moderation between Conscientiousness and gender



Moderation of personality traits and gender towards WTC

Out of the seven tested moderations, none were significant. Adding interaction terms for gender and personality traits did not significantly improve the model for any of the traits:

- *Extraversion*, $F(1, 212) = 0.75$, $p > 0.05$;
- *Neuroticism*, $F(1, 212) = 1.53$, $p > 0.05$;
- *Aggressiveness*, $F(1, 212) = 0.02$, $p > 0.05$;
- *Conscientiousness*, $F(1, 212) = 0.01$, $p > 0.05$;
- *Openness to experience*, $F(1, 212) = 0.01$, $p > 0.05$;
- *Positive valence*, $F(1, 212) = 1.70$, $p > 0.05$;
- *Negative valence*, $F(1, 212) = 0.36$, $p > 0.05$.

5 Discussion

The results indicate that most participants have average levels of WTC in BE (53.8%), but that there is also a relatively high number of participants with low WTC (28.0%). There is a somewhat lower percentage (18.2%) of those who reported high WTC in BE. The obtained results are consistent with those from the previous study (Šafranj and Katić, 2019) carried out on WTC in ESP. The results are partially consistent with some other findings (Knežević and Halupka-Rešetar, 2015) which noted a high level of willingness to read both inside and outside the ESP classroom and a high level of WTC inside and outside the ESP classroom (Halupka-Rešetar et al., 2018) for students of the humanities, but a lower level for their colleagues studying sciences.

The correlations between the variables in the study indicate that BE self-efficacy has a significant positive correlation with *Openness to experience* and *Positive valence* which are weak to moderate in intensity. Those individuals who have higher levels of *Openness to experience* and *Positive valence* also have higher linguistic self-efficacy. Open-minded individuals are intellectually curious, emotionally receptive, and open to new experiences. They are more creative and aware of how they feel, which helps them to communicate well and effectively. *Positive valence* indicates a positive self-perception. Positive self-image enables us to acknowledge both our strengths and our weaknesses. Individuals feel confident and deserving when they respect and value themselves. They are sociable and confident in their own abilities, which fosters communication self-efficacy. They are also open to learning and criticism, which can help them to improve their communication skills in BE.

WTC has a significant positive correlation with *Extraversion* and *Positive valence* in BE, but a negative correlation with *Neuroticism*. The correlation is weak in the case of *Neuroticism* but strong in intensity in the case of *Extraversion*. These results are partially in line with the previous research (Šafranj and Katić, 2019) carried out on WTC in ESP, which noted a small positive correlation between WTC in ESP and *Conscientiousness*, *Emotional stability* and *Agreeableness*. Moderate positive correlations were found between WTC in ESP and *Extraversion* and *Openness to experience*.

According to other findings (Öz, 2014), *Extraversion* and *Openness to experience* are the best predictors of WTC in EFL. These results support our findings that students who are curious, friendly, creative, person-focused, talkative, and outgoing are more likely to communicate in BE. Similarly, trustworthy, kind, honest, and helpful individuals have a greater propensity toward WTC in BE. These findings are consistent with those of other studies (Costa and McCrae,1985; Dewaele, 2007, 2012; Naiman et al., 1978) which found that an extravert who is talkative, active, person-oriented, sociable, optimistic, assertive, fun-loving, and affectionate is more willing to engage in interactions, which is driven by an innate optimism. The fact that they like to take risks seems to give them an edge over introverts, who tend to be shy, serious, aloof, quiet, unenthusiastic, and task-oriented. However, these results contradict previous research (Adelifar et al., 2016) indicating that *Extraversion* and *Openness to experience* had no effect on students' WTC. Additionally, the same study found a negative correlation between *Neuroticism* and WTC in EFL, which is consistent with our findings. Low emotional stability is characterized by emotional reactions and a desire to avoid relationships and social interaction. Also, *Neuroticism* was found to be unrelated to the students' foreign language attitudes and grades (Dewaele, 2002, 2007, 2012).

In addition, our results indicate that there was a positive correlation between gender and *Extraversion*, *Conscientiousness* and *Openness to experience*, indicating that, on average, female participants scored higher than their male counterparts on these dimensions. The correlation between gender and *Negative valence* was negative.

The influence of personality traits on self-efficacy in BE was explained by multiple regressions, but the influence of personality traits is mutually controlled. *Openness to experience* stands out as a positive and significant predictor. This personality dimension is characterized by a general appreciation for curiosity, and a variety of experiences. Open-minded individuals are intellectually curious, emotionally receptive, and willing to try new things. In comparison to closed individuals, they tend to be more creative and emotionally aware, which makes them more efficient and successful communicators. They are also more likely to hold unconventional beliefs, which makes them open to discussions and negotiations. Surprisingly, *Extraversion* is noted as a negative predictor, but it was also shown that moderation between *Extraversion* and gender is significant and this combined effect should be emphasized. Gender significantly moderates the relationship between two personality traits, *Extraversion* and *Conscientiousness*, and self-efficacy in BE. The results show that female participants with higher levels in both dimensions also show higher levels of self-efficacy in BE, while the pattern is different for their male counterparts. *Extraversion* is characterized by a variety of activities, energy surges from external events or situations, and energy generation from external sources. Strong interaction with the outside world distinguishes this characteristic. People frequently describe extraverts as having a lot of energy and enjoying social interaction. They typically have a positive, proactive attitude. They are outspoken, talk a lot, and stand up for themselves. Extraverts may appear more dominant than introverted individuals in social and business settings.

Positive valence and *Negative valence* are so-called evaluative dimensions, indicating how an individual perceives himself/herself. In this study, *Negative valence* has no significant association with either self-efficacy in BE or WTC. *Positive valence* has a significant positive correlation with both scales, which means that, in general, those

who perceive themselves more positively have higher self-efficacy in BE and WTC. In the context of regression that influence is diminished because other personality traits have a more significant impact, primarily *Openness to experience* for self-efficacy in BE and *Extraversion* for WTC.

On the basis of the obtained results, the following can be concluded:

- H1: *Openness to experience has a statistically significant impact on WTC in BE* is rejected.

The results show that *Extraversion* and *Positive valence* contribute statistically significantly to WTC in BE. Those with a higher level of *Extraversion* have a temperamental propensity for sociability and talkativeness, which allows them to initiate communication more quickly and easily. *Extraversion* also promotes self-efficacy through its traits of self-confidence, assertiveness, and high emotional creativity. Extraverted individuals are gregarious and enthusiastic in social situations. When they are around other individuals, they become more energetic and appreciative, which encourages and supports their communication self-efficacy. These are the traits of people who are comfortable communicating and have a good sense of their future success (Vaughan-Johnston et al., 2021).

Additionally, *Positive valence* denotes a positive self-perception. Positive self-image allows us to acknowledge our own strengths while being honest about our weaknesses. People feel assured and deserving when they value and respect themselves. They normally get along well with people and are confident in their abilities, which promotes self-efficacy. They are also open to new information and criticism, which can help them to improve their communication skills in BE.

Self-perception, also known as self-concept, has the power to affect our decisions, emotions, and behaviours (Öz et al., 2015). Positive self-perception increases the likelihood that we will have more optimistic thoughts and beliefs about the world as a whole, which can lead to more positive behaviour and communication self-efficacy. Self-perception affects communication in BE in the sense that an individual does not judge those who are different from him/her and accepts diversity.

- H2: *Openness to experience contributes statistically significantly to self-efficacy in BE* is confirmed.

Openness to experience and *Positive valence* are shown to be significant personality traits in relation to self-efficacy in BE. Students with a high *Openness to experience* are more likely to learn and enjoy BE, resulting in greater self-efficacy. *Positive valence* as a result of a positive self-image leads to increased positive behaviour and communication self-efficacy.

- H3: *Self-efficacy in BE statistically significantly contributes to WTC* is confirmed.

The results indicate that these two variables are in positive correlation. The WTC model is frequently used to explain the variables that influence L2 acquisition. Self-efficacy also helps to explain why some people persist despite the difficulty of L2 learning. The results of this study showed a moderate relationship between self-efficacy and WTC. It is possible that both of these variables will change if one of them does. This finding is in line with the results of Yashima's research (2002) which noted that WTC in L2 communication was also a result of self-confidence in L2 communication. WTC is independent because several things may have an impact on how it changes. Un-

doubtedly, self-efficacy influences WTC, and various conceptualizations of WTC in L2, ranging from personality traits to a context-related quality, reveal the complexity of this notion. It is important because it combines communicative, pedagogical, linguistic, and psychological aspects of language.

- H4: *There is a statistically significant correlation between gender and personality traits in BE* is confirmed.

Female participants have slightly higher *Extraversion*, *Conscientiousness* and *Openness to experience*, whereas male participants have higher *Negative valence*.

- H5: *Gender has a statistically significant influence on WTC and self-efficacy in BE* is rejected.

Gender has no direct effect on WTC and self-efficacy, but moderates the relationship with certain personality traits such as *Conscientiousness*, *Openness to experience*, *Extraversion* and *Negative valence*. Female participants have slightly higher *Extraversion*, *Conscientiousness* and *Openness to experience*, while their male counterparts have higher *Negative valence*.

6 Pedagogical implications

A successful improvement strategy could help students to feel more confident in their own abilities and increase their WTC. ESP pedagogy should include the following ideas for building self-efficacy in BE and WTC performance.

Firstly, ESP teachers should increase students' proficiency in BE in order to enhance their oral communication, presentation skills and the delivery of all other spoken genres used in BE settings. Previous research (Ruiz-Garrido and Molés Julio, 2021) indicates that students' proficiency in ESP increases their confidence in speaking, their ability to comprehend, and their evaluation of the most important factors to consider when preparing an oral presentation. The increase in students' proficiency in ESP could also help them to better prepare for oral presentations, which rely more on their English skills. The speaker's communication skills, such as active behaviour, proximity to the audience, nonverbal communication, message clarity, and the use of visual aids as supplementary tools, should be considered and enhanced as well. ESP teachers need to create multiple presentation opportunities for students to experience and internalize success, including speaking aloud with no audience present, speaking in small-group and whole-class settings, and, when feasible, in virtual public speaking environments. In the BE context these include telephone conversations with colleagues and clients, business pitches, negotiations, meetings, presenting trends through charts or graphs, etc.

Secondly, ESP teachers should also encourage students to spend more time and effort on preparation, such as researching engaging topics, looking for high-quality materials, and practising speech events. Additionally, ESP teachers should arouse students' interest in other people's speech topics, for instance, by providing background information and bringing up conflicts that reflect differing viewpoints and improve students' critical thinking and communicative skills.

In addition, due to the negative effects of psychological states, ESP teachers should create a friendly and cooperative classroom environment instead of one that is competitive and stressful. This will help speakers to feel less anxious, will encourage positive support, and lessen other negative feelings.

Finally, teachers should also be aware of the importance of developing self-regulated learning in their students (Gojkov Rajić et al., 2021; Šafranj et al., 2021; Čepon, 2018) in order to enhance their oral communication skills, presentation skills, and the delivery of all other spoken genres used in BE settings.

7 Conclusions

The interplay between a student's personality, self-efficacy, and WTC is apparent and highlighted in effective communication. The study results show that a good communicator has personality traits that support a strong sense of self-efficacy and willingness to communicate, such as *Openness to experience*, *Positive valence* and *Extraversion*. These students are intellectually curious, emotionally receptive, and open to new experiences. They are more creative, allowing them to communicate effectively. In addition, positive self-image enables them to feel confident and deserving when they respect and value themselves. They are sociable and confident in their own abilities, which fosters communication self-efficacy. According to the study findings, students had self-efficacy at a slightly above-average level and were willing to speak at a slightly higher than moderate level.

Self-efficacy and willingness to communicate can vary depending on the communication context, which includes the interlocutor, the topic of discussion, the environment and language skills, thereby urging the teacher to select different communication and presentation exercises. Therefore, teachers should be aware that communication is only effective if speakers can use their prior knowledge to frame messages in ways that listeners will recognize, anticipate, and find convincing. Teachers should develop strategies for practising communicative interactions along these lines.

The research findings leave room for further investigation, potentially in the direction that the interplay between self-efficacy, willingness to communicate, and personality traits could include motivation as an important factor of successful oral communication, which influences and contributes further to students' self-regulation in BE learning. Investigating the impact of intrinsic and extrinsic motivation, their intertwined relationship, and the continuum between free and controlled autonomous behaviour, which are the bases of the self-regulation of motivation, will contribute to a better understanding of BE classroom pedagogy.

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Preplet osebnosti, samoučinkovitosti in pripravljenosti za komuniciranje

V raziskavi ugotavljamo, kako osebnostne lastnosti in jezikovna samoučinkovitost vplivajo na pripravljenost za komuniciranje (WTC) pri učenju angleškega poslovnega jezika (BE). Raziskava je potekala med 216 študenti Tehniške fakultete Univerze v Novem Sadu, od katerih jih je 115 (53,2 %) ženskega in 101 (46,8 %) moškega spola, stari pa so od 18 do 26 let (M = 23,50, SD = 1,97). Angleščine kot tujega jezika so se učili od 8 do 17 let (M = 11,16, SD = 3,37). Ko je potekala raziskava, so vsi študenti obiskovali obvezni predmet Angleški poslovni jezik v drugem letniku študija.

Za raziskovanje in pridobivanje podatkov so bili uporabljeni trije vprašalniki: Velikih pet plus dva, skrajšana verzija (Čolović, Smederevac in Mitrović, 2014), vprašalnik Pripravljenost za komuniciranje (WTC) (McCroskey, 1992) in Vprašalnik samoučinkovitosti pri učenju angleškega jezika (QESE) (Kim idr., 2015).

Vprašalnik Velikih pet plus dva ocenjuje "velikih" sedem osebnostnih lastnosti. Vsaka lastnost je bila izmerjena na podlagi 10 elementov na petstopenjski Likertovi lestvici (od 1 – ne strinjam se do 5 – popolnoma se strinjam). Zanesljivost stopenj, izmerjenih s Cronbachovim koeficientom alfa, je bila: ekstravertnost: α = 0,87, nevrotizem: α = 0,86, odprtost za izkušnje: α = 0,77, agresivnost: α = 0,85, vestnost: α = 0,89, pozitivna valenca: α = 0,89, negativna valenca: α = 0,85. Vrednosti zanesljivosti lestvice so bile od zadovoljive do odlične.

Vprašalnik Pripravljenost za komuniciranje (WTC) (McCroskey, 1992) predstavlja udeležencem 20 hipotetičnih situacij, v katerih imajo možnost komunikacije ali pa ne. Situacije segajo od vsakdanjih, kot npr. pogovor s prijatelji, do izzivov, kot je npr. imeti govor. Za vsako situacijo morajo udeleženci oceniti svojo pripravljenost za komuniciranje s stopnjo od 0 do 100. Cronbach alfa zanesljivost je bila v trenutnem vzorcu odlična, α = 0,93.

Vprašalnik samoučinkovitosti pri učenju angleškega jezika (QESE) (Kim idr., 2015) obsega 32 stopenj in uporablja sedemstopenjsko lestvico od 1 ("Tega nikakor ne zmorem.") do 7 ("To lahko zelo dobro naredim."). Oblikovan je tako, da meri naslednja štiri področja:

- *samoučinkovitost poslušanja (8 stopenj);*
- *samoučinkovitost govorjenja (8 stopenj);*
- *samoučinkovitost branja (8 stopenj) in*
- *samoučinkovitost pisanja (8 stopenj).*

Med podstopnjami, ki merijo različne jezikovne spretnosti, je bila zelo visoka korelacija in odveč jih je bilo uporabljati ločeno, ker bi v nekaterih analizah porušile zanesljivost statističnih postopkov. Združene so bile v eno splošno lestvico, ki predstavlja splošno merilo samoučinkovitosti. Cronbach alfa zanesljivost je bila v trenutnem vzorcu odlična, α = 0,98.

Vprašalnik samoučinkovitosti pri učenju angleškega jezika in vprašalnik Pripravljenost za komuniciranje sta bila prevedena v srbski jezik z uporabo iterativnega pro-

cesa ponovljenega neodvisnega prevajanja in slepega povratnega prevajanja. Manjše razlike v izboru besed in fraz so bile popravljene, da bi besede v srbskem jeziku zagotovo imele enak pomen kot besede v izvirniku.

Rezultati nakazujejo povprečne ravni pripravljenosti za komuniciranje v angleškem poslovnem jeziku pri večini udeležencev (53,8%), vendar obstaja tudi relativno visoko število udeležencev z nizko pripravljenostjo za komuniciranje (28,0%). Nekoliko nižji je odstotek (18,2%) tistih, ki so pokazali visoko pripravljenost za komuniciranje. Pridobljeni rezultati se ujemajo s tistimi iz predhodne študije (Šafranj in Katić, 2019). Rezultati se delno ujemajo tudi z nekaterimi drugimi ugotovitvami (Knežević in Halupka-Rešetar, 2015), v katerih je bila ugotovljena visoka raven pripravljenosti za branje in komuniciranje v in zunaj učilnice (Halupka-Rešetar idr., 2018) za študente humanističnih ved, vendar nižja za njihove kolege, tj. študente naravoslovnih ved.

Korelacije med variablami razkrivajo, da ima samoučinkovitost v angleškem poslovnem jeziku pomembno pozitivno korelacijo z odprtostjo za izkušnje in pozitivno valenco, ki sta šibko do zmerno intenzivni. Posamezniki z višjo ravnjo odprtosti za izkušnje in pozitivne valence izkazujejo tudi večjo jezikovno samoučinkovitost. Osebe odprtega duha so ustvarjalnejše in se bolj zavedajo svojih občutkov, kar jim pomaga pri dobrem in učinkovitem komuniciranju. Pozitivna valenca pomeni pozitivno samopodobo. Posamezniki čutijo samozavest in lastno vrednost, če se spoštujejo in cenijo.

Pripravljenost za komuniciranje ima pomembno pozitivno korelacijo z ekstravertnostjo in pozitivno valenco, vendar pa negativno korelacijo z nevrotizmom. V primeru nevrotizma je korelacija šibka, vendar zelo intenzivna v primeru ekstravertnosti. Ti rezultati se delno ujemajo s predhodno raziskavo (Šafranj in Katić, 2019), ki je ugotovila majhno pozitivno korelacijo med pripravljenostjo za komuniciranje, ekstravertnostjo in odprtostjo za izkušnje.

Glede na druge rezultate (Öz, 2014) sta ekstravertnost in odprtost za izkušnje najboljša napovedovalca pripravljenosti za komuniciranje. Ti rezultati podpirajo naše ugotovitve, da bodo študenti, ki so radovedni, družabni, ustvarjalni, osredotočeni na osebo, zgovorni in odprti, bolj verjetno komunicirali v angleškem jeziku. Podobno so zaupanja vredni, ljubeznivi, pošteni in koristni posamezniki bolj nagnjeni k pripravljenosti za komunikacijo. Te ugotovitve so v skladu z nekaterimi drugimi raziskavami (Costa in McCrae, 1985; Dewaele, 2007, 2012; Naiman idr., 1978), vendar v nasprotju z nekaterimi predhodnimi raziskavami (Adelifar idr., 2016), ki nakazujejo, da ekstravertnost in odprtost za izkušnje nista vplivali na pripravljenost za komuniciranje. Slednja študija je tudi odkrila negativno korelacijo med nevrotizmom in pripravljenostjo za komuniciranje, kar se ujema z našimi ugotovitvami.

Rezultati prikazujejo, da je pozitivna korelacija med spolom in ekstravertnostjo, vestnostjo in odprtostjo za izkušnje. Povprečno so ženske dosegle boljši rezultat kot moški kolegi pri teh dimenzijah. Korelacija med spolom in negativno valenco je bila negativna. Odprtost za izkušnje izstopa kot pozitiven in pomemben napovednik. Ekstravertnost je presenetljivo zabeležena kot negativni napovednik, vendar se je izkazalo, da je zmernost med ekstravertnostjo in spolom pomembna in je potrebno ta skupni učinek poudariti. Spol pomembno ublaži odnos med dvema osebnostnima lastnostima, ekstravertnostjo in vestnostjo, ter samoučinkovitostjo v poslovni angleščini. Glede na rezultate imajo udeleženke z višjima ravnema v obeh dimenzijah višjo raven samoučin-

kovitosti, za njihove moške kolege pa je vzorec drugačen. Ekstravertnost karakterizirajo različne dejavnosti, spodbuda zaradi dogodkov ali situacij v okolju in ustvarjanje energije iz zunanjih virov. Pozitivna in negativna valenca sta tako imenovani ocenjevalni dimenziji, ki predstavljata, kako posameznik doživlja samega sebe. V tej raziskavi negativna valenca ni pomembneje povezana s samoučinkovitostjo in pripravljenostjo za komuniciranje. Pozitivna valenca ima pomembno pozitivno korelacijo z obema lestvicama, kar na splošno pomeni, da tisti, ki sebe doživljajo pozitivno, izkazujejo večjo samoučinkovitost in pripravljenost za komuniciranje. V kontekstu regresije se ta učinek zmanjšuje, ker imajo pomembnejši vpliv druge osebnostne lastnosti, predvsem odprtost za izkušnje na samoučinkovitost in ekstravertnost na pripravljenost za komuniciranje.

Sorodne pedagoške vsebine se nanašajo na učitelje, ki morajo spodbujati pridobivanje znanja pri študentih, da bi izboljšali njihovo ustno komuniciranje, spretnosti predstavitev in uporabo drugih govornih zvrsti. Napredek v znanju študentov bi jim lahko pomagal, da se bolje pripravijo za ustne predstavitve, ki bi bile bolj podprte z njihovim znanjem angleščine. Prav tako je potrebno upoštevati in izboljšati tako komunikacijske spretnosti kot aktivno vedenje, bližino občinstva, neverbalno komuniciranje, jasnost sporočila in uporabo vizualnih pripomočkov kot dopolnilnih orodij. Učitelji morajo ustvariti več možnosti predstavitev za študente, da izkusijo in ponotranjijo uspeh, vključno s predavanjem brez občinstva, v manjših skupinah in pred celotnim oddelkom ter, če je to izvedljivo, v virtualnem okolju javnih nastopov. V kontekstu angleškega poslovnega jezika to vključuje telefonske pogovore s kolegi in strankami, poslovne predstavitve, pogajanja, sestanke, predstavljanje trendov s pomočjo tabel in grafov ipd.

Učitelji morajo tudi spodbujati študente, da porabijo več časa za pripravo, na primer raziskovanje zanimivih tem, iskanje visokokakovostnih gradiv in vaje iz govornih dogodkov. Poleg tega je potrebno spodbuditi zanimanje študentov za druge teme, kot npr. zagotavljanje osnovnih informacij in predstavljanje konfliktov, mnenj, ki izražajo različne poglede, izboljšujejo kritično razmišljanje ter komunikacijske spretnosti.

Prav tako morajo učitelji vzpostaviti v učilnici prijateljsko in sodelovalno okolje namesto tekmovalnega in stresnega. To bo pomagalo študentom, da bodo čutili manj anksioznosti, spodbudilo bo pozitivno podporo in zmanjšalo druga negativna čustva.

Končno se morajo učitelji zavedati tudi pomena razvoja samoreguliranega učenja pri svojih študentih (Gojkov Rajić idr., 2021; Šafranj idr., 2021; Čepon, 2018), da bi spodbudili napredek v spretnostih njihovega ustnega komuciranja, spretnostih predstavitev in uporabe drugih govornih zvrsti v angleškem poslovnem jeziku.

Sklepamo lahko, da je interakcija med osebnostjo študenta, samoučinkovitostjo in pripravljenostjo za komuniciranje očitna in poudarjena v učinkoviti komunikaciji.

Razmere v družbi se hitro spreminjajo, znanje nenehno zastareva, spreminjajo se metode poučevanja, saj se fokus iz "na predavatelja osredinjenega poučevanja in učenja" vedno bolj premešča v "na študenta osredinjeno poučevanje" in spodbujanje aktivne vloge študentov pri usvajanju znanja. Digitalizacija in zahteve po učinkoviti uporabi informacijsko-komunikacijske opreme (IKT) v pedagoškem procesu so vedno večje in zahtevajo nenehno usposabljanje in izpopolnjevanje kadrov. Pedagoška usposobljenost predavateljev bistveno vpliva na kakovost poučevanja in posledično na kakovost znanja in kompetenc diplomantov ter njihovo zaposljivost, zato bi jo bilo potrebno nenehno izpopolnjevati (Goltnik Urnaut, 2022, str. 128).

Rezultati te študije nudijo prostor za nadaljnje raziskave v smeri interakcije med samoučinkovitostjo, pripravljenostjo za komuniciranje, osebnostnimi lastnostmi in motivacijo kot pomembnim dejavnikom uspešne komunikacije, ki vpliva na samoregulacijo učenja. Raziskovanje vpliva notranje in zunanje motivacije, njunega prepletenega odnosa ter kontinuuma med svobodnim in kontroliranim avtonomnim vedenjem, kar predstavlja osnovo samoregulacije motivacije, prispeva k boljšemu razumevanju učenja angleškega jezika.

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Sekundarna analiza podatkov in masovni podatki v pedagoškem raziskovanju

Prejeto 10. 10. 2022 / Sprejeto 8. 5. 2023

Znanstveni članek

UDK 001.891+311.213.5

KLJUČNE BESEDE: sekundarna analiza podatkov, masovni podatki, rudarjenje podatkov, učna analitika

POVZETEK – Prispevek se usmerja v dva koncepta, ki se tudi na področju raziskovanja vzgoje in izobraževanja vse pogosteje pojavljata v strokovnih razpravah, nista pa bila znotraj tega področja pri nas še deležna dovoljšne pozornosti, zato sta manj poznana in razširjena ter skromno implementirana. V prvem delu prispevka se usmerjamo v sekundarno analizo podatkov, pri čemer najprej opredelimo sam koncept sekundarne analize podatkov, nato pa analiziramo potencial in zadržke pri rabi tovrstnih podatkov. V nadaljevanju predstavimo pojem masovni podatki, ki z vse večjo digitalizacijo, tudi v šolskem prostoru, postajajo vse pomembnejši vir podatkov, ki predstavlja pomembno osnovo za načrtovanje sprememb za višjo kakovost izobraževanja. Hkrati predstavimo tudi pomembne slabosti rabe masovnih podatkov, med katerimi se zlasti usmerimo v problem varnosti podatkov na spletu ter pomanjkanja kompetentnih strokovnjakov za analizo tovrstnih podatkov. Oba koncepta skušamo tudi smiselno umestiti v polje pedagoškega raziskovanja.

Received 10. 10. 2022 / Accepted 8. 5. 2023

Scientific paper

UDC 001.891+311.213.5

KEYWORDS: secondary data analysis, massive data, data mining, learning analytics

ABSTRACT – The paper focuses on two concepts that are increasingly emerging in professional debates in the field of educational research, but which have not yet received sufficient attention within the field and are therefore less known, less widely used and modestly implemented. The first part of the paper focuses on secondary data analysis; the concept itself is introduced, while its potential and drawbacks, such as being collected for other purposes, are analysed. We then introduce the Big Data concept which, with the shift of digitalization, has also become an important source of data in education, and a linchpin for planning changes to improve the quality of education. At the same time, we highlight the challenges of using Big Data, such as security and the lack of competent professionals for data analysis. The paper also aims to embed both concepts in the field of educational research.

1 Uvod

Če velja, da je raziskovanje načrten, sistematičen, kritičen in samokritičen proces pridobivanja novega znanja, ki izhaja iz raziskovalnih ciljev in poteka po vnaprej določenih fazah, za raziskovanje na pedagoškem področju trdimo, da je v osnovi njegov cilj pridobivanje oz. ustvarjanje znanja na pedagoškem področju (Cencič, 2009). Pedagoško raziskovanje je tudi zelo kompleksno področje, ki vključuje in združuje različne raziskovalne paradigme, številne tehnike zbiranja podatkov, raznolike udeležence raziskav in raznolike obdelave podatkov (Štemberger, 2020). Hkrati gre tudi za področje, ki mora slediti družbenim spremembam in potrebam ter se nanje tudi kar najhitreje odzivati; med njimi je tudi vse pogostejša vsakdanja raba digitalnih tehnologij za namene poučevanja in učenja, s svojim načinom delovanja pa vodi tudi v ogromne količine zbranih podatkov. Količina podatkov in dejstvo, da so ti podatki že zbrani, odpirata številne nove možnosti

raziskovanja, pri čemer pa je pomembno, da se zavedamo prednosti in tudi pasti tako zbranih oz. izbranih podatkov ter tudi pasti teh postopkov. V prispevku se zato osredinjamo na dva ključna koncepta, ki ju je v povezavi z velikimi količinami podatkov treba tudi na pedagoškem področju ustrezno opredeliti in utemeljiti – to sta sekundarna analiza podatkov (angl. secondary data analysis) in masovni podatki (angl. big data).

2 Sekundarna analiza podatkov

Omeniti je treba, da sekundarna analiza podatkov ni nov pojav. Tako so denimo Kozina idr. (2012, str. 131) na osnovi baz raziskav TIMSS, v katerih so zbrani predhodno zbrani podatki za dijake, učitelje in ravnatelje, v svojo raziskavo "vključili tiste dijake, ki so se pripravljali na izpitni preizkus iz fizike". Kunčič idr. (2013, str. 45) so v prispevku analizirali zapise spletnih dnevnikov, ki so bili v osnovi "zapisani kot učno sredstvo za doseganje ciljev pouka". Čepar idr. (2022) so za prispevek, ki naslavlja povezovanje srednjega šolstva in gospodarstva, uporabili podatke "iz Statističnega urada Republike Slovenije", kar so tudi eksplicitno označili kot sekundarne podatke (prav tam, str. 132).

Vendarle pa so navedeni primeri dokaj osamljena praksa na področju pedagoškega raziskovanja, kar kaže na to, da je sekundarna analiza podatkov na tem področju še vedno premalo poznana in uporabljena. Smithova (2008) sicer ugotavlja, da se pojavljajo številne definicije analize sekundarnih podatkov, pri čemer prednjačijo tiste, ki poudarjajo uporabnost analize sekundarnih podatkov za raziskovanje s postavljanjem novih raziskovalnih vprašanj. Te definicije po njenem mnenju sicer zanemarjajo potencial sekundarnih podatkov za ponovno analizo istih podatkov z uporabo drugih statističnih ali teoretskih pristopov, da se torej ponovno išče odgovore na prvotno postavljena raziskovalna vprašanja, pri čemer se na primer uporabi naprednejše statistične metode.

V osnovi so sekundarni podatki definirani kot podatki, ki jih je nekdo predhodno že zbral in tudi uporabil (Smith, 2008), pri čemer pa Schutt (2007) navaja, da to velja, tudi če podatke ponovno uporabi ista oseba ali ista skupina oseb, ki je te podatke že zbrala in obdelala. Iz tega sledi, da ni vedno mogoče postaviti natančne ločnice med primarnimi in sekundarnimi podatki. Zato Jary in Jary (2000, str. 540) predlagata precej splošno definicijo analize sekundarnih podatkov, in sicer da gre za vsako raziskavo, ki temelji na ponovni analizi predhodno analiziranih podatkov.

Potencial sekundarne analize podatkov

Glaser (1963) je že pred desetletji poudaril, da z rabo sekundarnih podatkov prihranimo čas in denar, a tudi ohranjamo kariere, raziskovalne interese, samopodobo ter tako na neki način "rešimo" ogromne količine podatkov pred njihovo izgubo.

Smithova (2008) povzema naslednje prednosti sekundarne analize podatkov:

- Raziskovalcem omogoča dostop do velikih vzorcev, ki bi jih z lastnim zbiranjem podatkov bistveno težje dosegli.
- Če raziskovalec uporabi sekundarne podatke, mu ni treba vložiti časa in napora za pripravo instrumenta zbiranja podatkov, kar je tudi prednost za raziskovalce z manj metodološkega pa tudi tehničnega znanja. Še več, kot poudarja Yorke (2011), so

sekundarni podatki na voljo takoj, tako da na rezultate ni treba dolgo čakati, kar v hitro spreminjajoči se družbi omogoča tudi sorazmerno hitro prilagajanje trenutnim razmeram.

Navaja pa tudi, da sekundarni podatki lahko predstavljajo priložnost za generiranje novih raziskovalnih idej, npr. za odkrivanje drugačnih razmerij, povezanosti ali razlik, kot so bile zasnovane v primarni raziskavi. Podobno navaja tudi Yorke (2011), saj meni, da zbrani podatki omogočajo tudi uresničevanje raziskovalnih ciljev, ki jih primarna analiza ni naslovila. Poudarja, da celo organizacije, ki imajo dostop do ogromnih baz podatkov in razpolagajo s kompetencami za statistično obdelavo podatkov (pri čemer navaja npr. National Center for Educational Statisitcs (ZDA), Higher Education Funding Council (Velika Britanija)), ne uspejo izkoristiti vsega potenciala teh podatkov, kar odpira pot sekundarni analizi podatkov. Smithova (2011) dodaja, da sekundarni podatki ponujajo številne priložnosti za ponavljanje analiz in ponovno interpretacijo. Omogočajo izpeljavo longitudinalnih raziskav, raziskovanje preteklih dogodkov ter eksploratorne raziskave za testiranje novih idej, teorij in modelov. Z uporabo podatkov drugih virov je omogočena triangulacija. Že leta 1974 je Cook (1974) poudaril, da zastavljanje drugačnih raziskovalnih vprašanj, uporaba drugih statističnih metod za sekundarne podatke lahko pripelje tudi do tega, da se razkrijejo morebitne napake prvotnih analiz.

Nadalje se poudarja tudi (Hakim, 1982; Glaser, 1963), da so sekundarni podatki običajno visokokakovostni in s finančnega vidika (Hakim, 1982; Smiht, 2008; Yorke, 2011) visoko dostopni. Ta vidika sta pomembna, ker je v številnih primerih sicer zbiranje podatkov lahko zelo drag proces in je zato dostopnost do visokokakovostnih podatkov na eni strani pomembna za raziskovalce začetnike, pa tudi za izkušenejše raziskovalce, saj jim omogoča visoko stopnjo raziskovalne neodvisnosti. Z izpustitvijo faze zbiranja podatkov lahko raziskovalci začetniki in tudi študentje pridobijo dragoceno izkušnjo izvedbe neodvisne raziskave na področju zanimanja in možnosti objave rezultatov. V tem smislu imajo sekundarni podatki pomembno vlogo pri izgrajevanju raziskovalnih kompetenc, pa tudi razvoju raziskovalnih interesov (Smith, 2021). Na pomen sekundarnih podatkov za izgrajevanje raziskovalnih kompetenc opozarja tudi Sobal (1981), ki meni, da imajo ti pomembno vlogo pri poučevanju, še posebej pri poučevanju raziskovalne metodologije. Ob sekundarnih podatkih imajo lahko zainteresirani namreč tudi vpogled v vprašalnike (s katerimi so bili podatki zbrani), ki so lahko izhodišče za diskusijo o pozitivnih in slabih praksah pri oblikovanju vprašanj, konstrukciji lestvic, vrstnem redu vprašanj in pri uporabljenih metodah statistične obdelave (Sobal, 1981). Prav tako so sekundarni podatki zelo uporabni pri učenju in poučevanju statistike, od postavljanja hipotez, vzorčenja do izbire ustreznih statističnih metod za obdelavo podatkov (Smith, 2008).

Bulmer (1980) poudarja, da raba sekundarnih podatkov predstavlja zelo nevsiljiv način zbiranja podatkov (pravzaprav le obdelave podatkov), saj ne posega v življenje posameznika ali skupine, ščiti njihovo zasebnost, saj ne sprašuje o nekom in njegovih dejavnostih. Ta značilnost je še toliko pomembnejša v raziskavah, ki naslavljajo občutljive teme ali skupine ljudi, še posebej v primeru, ko so skupine ali posamezniki težje dostopni. Kot navaja Gorard (2002), so sekundarni podatki v današnjih družbenih razmerah lahko še kako pomembni tudi z vidika opisovanja neenakosti, saj omogočajo opisovanje stanja brez poseganja v ranljive skupine oz. izpostavljanja ranljivih skupin zaradi namenskega zbiranja podatkov. Ti podatki lahko služijo politiki za postavljanje mehanizmov, ki bi omogočili premagovanje neenakosti, tudi v šolstvu. Kot opozarja

Petlák (2021, str. 42), so zato potrebne reforme izobraževalnih sistemov, ki vnašajo inovacije v vsebine izobraževanja, pa tudi take, ki poudarjajo kakovost izobraževanja učiteljev. Gorard (2002) predlaga dvostopenjski pristop: najprej se na osnovi obstoječih sekundarnih podatkov identificira neki trend, vzorec ali situacijo, nato pa se to preuči bolj poglobljeno, predvsem z rabo kvalitativnih pristopov.

Pomembno je poudariti tudi pomen analize sekundarnih podatkov v deskriptivnih raziskavah, in to kljub dejstvu, da imajo v akademskih krogih deskriptivne študije običajno nižji status kot študije, ki preverjajo povezanost, razlike ali napovedi, nižje pa je tudi zaupanje v možnost posploševanja, pri čemer se raziskovalci pogosto usmerjajo v pojasnjevanje nekega pojava, še preden se dokaže njegov dejanski obstoj. Zadnje vodi v to, da so številni pojavi prešibko opisani in slabo izmerjeni, saj se prehitro preide v preverjanje napovedi itn. (Campbell idr., 1982).

Zadržki pri sekundarni analizi podatkov

Yorke (2011) opozarja, da je sekundarne podatke treba natančno pregledati, da se razjasnijo morebitne šibkosti in da se, če je treba, izpostavijo omejitve teh podatkov, ki jih je treba upoštevati pri analizi in predstavitvi rezultatov teh analiz. Smithova (2008) kot glavna zadržka pri rabi sekundarnih podatkov navaja dejstvi, da je lahko v obstoječih zbirkah podatkov veliko napak in da so družboslovni podatki "zreducirani" na številke, ki ne morejo predstaviti kompleksnosti tovrstnih pojavov. Na obstoj napak v zbirkah podatkov kažejo napake v podatkih, ki se uporabljajo za uradne statistike. Ob tem je veliko podatkov zreduciranih na določene kategorije, kot na primer na etnično pripadnost ali socialni sloj, kar v nekaterih krogih vodi v zadržke o rabi numeričnih podatkov v družboslovnem raziskovanju. Smithova (2008) pa opozarja, da kompleksnost podatkov ne bi smela biti razlog, da sekundarnih podatkov ne bi uporabljali. Meni namreč, da lahko sekundarni podatki omogočijo še drug pogled na svet, lahko pripomorejo k identifikaciji trendov in neenakosti, kar je lahko izhodišče za nadaljnje, bolj poglobljene raziskave. Uradni statistični podatki so po njenem mnenju preveč pomembni, da jih ne bi vključili v raziskave oz. da bi njihovo interpretacijo prepustili politiki ali medijem. Poudarja, da se prav tu kažeta pomen in vloga raziskovalcev, saj pomagajo povezati in osmisliti empirične podatke, družbeni kontekst in obstoječe teoretične modele.

Nadalje avtorji Yorke (2011), Smith (2008) ter Gorard in Smith (2004) kot pomembno šibkost sekundarne analize podatkov izpostavljajo dejstvo, da podatki mogoče ne predstavljajo točno tistih značilnosti, ki jih je raziskovalec želel raziskati: gre torej za kompromis med podatki, ki so na voljo, in podatki, ki bi jih želeli imeti, torej "idealnimi podatki". Raziskovalec se mora v zgodnji fazi raziskovalnega procesa odločiti, ali so podatki dovolj dobri za namen raziskave.

Yorke (2011) nadaljuje, da je treba ob vsaki raziskavi vzeti v obzir dejstvo, da so bili podatki zbrani za druge namene in da se je za vsakokratno situacijo treba odločiti, ali je tveganje upravičeno. Pri tem se mora raziskovalec zavedati, da podatki niso vedno najvišje kakovosti, saj se na primer lahko zgodijo napake pri vnosu in tudi v povezavi s hranjenjem podatkov. Pri zadnjem gre npr. za princip, ali in kako neki novejši podatki izpodrinejo stare (npr. višanje ocen). Baze podatkov mogoče niso kompatibilne, kar vodi v kompromis o kategorizaciji podatkov.

3 Masovni podatki

V zadnjem času je znotraj osrednjega koncepta sekundarnih podatkov opazen trend rabe masovnih podatkov, katerega poimenovanje izhaja iz angleške besedne zveze "big data" in je na pedagoškem področju pri nas res šibko poznano, kar pa sicer velja tudi za druge države (Smith, 2021). Masovni podatki se lahko različno definirajo, v osnovi pa je to poimenovanje za velike količine strukturiranih in nestrukturiranih podatkov (Smith, 2021). Brands (2014) opredeljuje masovne podatke kot proces združevanja enormnih količin na različne načine zbranih podatkov, ki se jih analizira z rabo kompleksnih algoritmov z namenom informiranja v procesu odločevanja.

Dejstvo je, da digitalizacija – tudi kot posledica izrednih razmer v povezavi s šolanjem na daljavo – vse bolj vstopa tudi v izobraževanje ter s tem omogoča zbiranje in množenje digitalnih podatkov, ki se lahko uporabijo za namene raziskovanja učenja in poučevanja ter v končni fazi za zviševanje učinkovitosti izobraževalnega procesa. Razširjena in, kot ugotavljata Müller in Kuprešak (2018, str. 95), tudi priljubljena raba e-okolij, forumov, spletnih pogovorov, spletnih učilnic odprtih izobraževalnih virov (angl. OER-open educational resources), raba pametnih telefonov za učenje izjemno povečujejo količino že zbranih podatkov, pri čemer pa pristopi k raziskovanju ostajajo še precej tradicionalni. Kljub temu pa se že kažejo nekatere rabe masovnih podatkov, ki uspešno izkoriščajo prednosti že zbranih podatkov (Anirban, 2014). Keržič (2022) podobno izpostavlja, da se med izobraževanjem na daljavo v različnih informacijskih sistemih hranijo podatki o študentu, prav tako pa izobraževalne ustanove na terciarni ravni s spletnimi vprašalniki zbirajo mnenja o vsebinah, ki se navezujejo npr. na kakovost študijskega procesa. V spletnih učnih okoljih se shrani vsaka interakcija, vsak klik v e-okolju, kar se zapiše v dnevniških datotekah (npr. vstop v učilnico, ogled vira, objava na forumu, oddaja naloge, odgovarjanje na vprašanja v kvizu). Vse te velike količine raznovrstnih in nestrukturiranih podatkov, shranjenih v različnih oblikah, lahko ob ustrezni interpretaciji predstavljajo pomemben vir informacij o procesu učenja posameznika. Bamiah idr. (2018) poudarjajo, da je z razmahom digitalnih tehnologij in povečano rabo MOOC-ov prišlo do spremenjenega načina poučevanja, učenja in ocenjevanja, pa tudi do spremenjenega dostopa do izobraževanja. Izobraževanje po njihovem mnenju prehaja v okolje pametnega kombiniranega učenja z vključevanjem najrazličnejših digitalnih orodij, vendar pa izobraževalne ustanove običajno nimajo resursov za upravljanje in analiziranje kompleksnega korpusa tako zbranih podatkov. Prav na osnovi teh podatkov pa je mogoče učinkovito napovedati npr. dosežke učencev. Računalniški napredek omogoča samodejno in v realnem času (ne naknadno) izvedeno zbiranje podatkov, njihovo hranjenje, obdelavo in analizo.

Pri uresničevanju potenciala masovnih podatkov v izobraževanju sta zlasti pomembna koncepta rudarjenje izobraževalnih podatkov (angl. EDM – Educational Data Mining) in učna analitika (angl. LA – Learning Analytics), na osnovi katerih se lahko preučuje vedenje in dosežke učečih se. Omogočata analizo procesa učenja skozi preučevanje interakcije v učnem okolju prek avtomatizirane interaktivne platforme, kot so npr. LMS, ITS Learning Management Systems (LMS), Intelligent Tutoring Systems (ITSs) (Prakash idr., 2014). Rudarjenje izobraževalnih podatkov se uporabi za iskanje novih vzorcev, algoritmov in modelov, kar poteka na podlagi principov statističnih metod in na podlagi metod rudarjenja podatkov. Te podatke se lahko raziskuje za oblikova-

nje prilagodljivih sistemov učenja, ki lahko podprejo proces učenja. Učna analitika se nanaša na merjenje in analizo ogromnih baz podatkov in njihovih kontekstov s ciljem izboljšanja učnih dosežkov (Prakash idr., 2014). Učna analitika vključuje interpretacijo teh baz podatkov in predstavljanje podatkov z orodij (npr. vizualnimi), ki omogočajo napovedovanje prihodnjih dosežkov in zaznavanje morebitnih šibkih področij (Yu in Wu, 2015) oz. vodijo k zbiranju in vzorčenju podatkov o zainteresiranosti učencev, njihovem ravnanju, rabi učnih pripomočkov, navadah, rabi jezika, trajanju pozornosti, o akademski uspešnosti itn. (Beneito-Montagur, 2017; Jarke in Breiter, 2019). Keržič (2022) navaja, da učna analitika predstavlja preplet računalniških in statističnih znanosti ter učnih in vedenjskih teorij ter vključuje merjenje in zbiranje podatkov, ki nastajajo med izobraževanjem, ter njihovo analizo, ki je prilagojena tako, da se na njeni osnovi lahko opredeli procese učenja in poučevanja. Siemens (2011) pa učno analitiko deli na učno in akademsko, pri čemer obema pripisuje pomen pri izboljševanju učnega procesa in učnih dosežkov. Meni, da se učna analitika lahko izpelje na osebni ravni, na ravni nekega predmeta ali programa, akademska pa na institucionalni, regionalni, nacionalni ali na mednarodni ravni.

Ko izobraževanje v celoti ali delno poteka z rabo digitalnih tehnologij in spletnih platform, se o njem s pomočjo učne analitike generirajo številni podatki (Oi idr., 2017), kar učitelju omogoča, da takoj dostopa do učenčevih učnih dosežkov in vzorcev sodelovanja ter da učencu takoj da povratno informacijo (Black in William, 2018). Pravočasna in seveda konstruktivna povratna informacija lahko pomembno vpliva na učenčevo nadaljnje ravnanje, saj ga dodatno spodbudi in usmeri (Zheng in Bender, 2019). Podatki učitelju omogočijo tudi analizo lastnih pristopov k poučevanju in ga tako spodbudijo za spremembe lastne poučevalne prakse v smislu prilagajanja procesa potrebam in zahtevam učencev.

Anirban (2014), Russom (2011) in Siemens (2011) poudarjajo, da analitika masovnih podatkov vključuje rabo naprednih metod analitike na velikih količinah podatkov ter tako omogoča odkrivanje vzorcev in osmišljeno rabo informacij. Avtomatizirana poročila analitike povečujejo učinkovitost, omogočajo boljši vpogled in zavedanje, kar lahko vodi v dvig kakovosti izobraževanja z vidika posameznika in ustanove. Vendarle pa se, kot poudarja Daniel (2014), analitika masovnih podatkov, tudi zaradi kompleksnosti identifikacije relevantnih podatkov, ki terjajo znanje, resurse in čas, na področju vzgoje in izobraževanja uvaja le počasi. Ta vključuje rudarjenje podatkov, analitiko podatkov in spletne prikazovalnike. Kot navajata Cope in Kalantzis (2015), analitika omogoča poglobljen vpogled v področje. Na pedagoškem področju se torej masovni podatki uporabljajo za izboljšanje izobraževanja, predvsem za spodbujanje k boljšim učnim dosežkom, vztrajanje v izobraževanju, preučevanje načinov učenja in poučevanja ter ocenjevanja in prilagajanje procesa učenja in tudi poučevanja glede na potrebe učencev in njihove sposobnosti ter tudi institucionalno odgovornost.

Prednosti masovnih podatkov

Raba masovnih podatkov po navedbah nekaterih avtorjev (Riffai idr., 2016) lahko pomembno pripomore k izboljšanju učne izkušnje. Podatki s področja vzgoje in izobraževanja se namreč lahko agregirajo za veliko število učečih se in se do njih lahko dostopa prek algoritmov za rudarjenje s ciljem izgradnje modela. Modeli se uporabijo za izgradnjo prilagodljivih sistemov učenja, v katerih se na osnovi modelskih napovedi

prilagodi/spremeni učenčevo naslednjo učno izkušnjo ali se priporoča neko drugo učno izkušnjo. Na osnovi analize masovnih podatkov se tako lahko poveča učiteljeva učinkovitost, ki na osnovi povratne informacije lažje poskrbi za zagotavljanje ustreznega, učinkovitega okolja za učenje in poučevanje ter se lažje prilagaja potrebam učečih se in virom, ki jih ima na voljo. Podatki in množična vključenost v vzgojno-izobraževalni sistem pomembno prispevajo k oblikovanju pričakovanih dosežkov, odgovornosti in dostopa, kar se lahko uresniči z zagotavljanjem infrastrukture in uvajanjem trajnostnih sprememb, ki vodijo v institucionalizacijo ustvarjanja, in izmenjave znanja (Amershi in Conati, 2009). Liñán in Pérez (2015) navajata, da masovni podatki omogočijo učitelju, da nemudoma pridobi povratne informacije, na osnovi katerih lahko opravi evalvacijo nekega predmeta ter tudi lastnega poučevanja in ocenjevanja. Učitelj lahko nadzoruje proces učenja in tako zelo hitro odkrije šibka področja, dejavnike tveganja glede na sposobnosti učencev in raven njihovega znanja. Russom (2011) dodaja, da masovni podatki omogočajo tudi individualizacijo, formativno ocenjevanje, participacijo, aktivno sodelovanje učečih se in sodelovalno učenje. Omogočajo tudi napovedovanje učnih izidov in sledenje napredku znotraj nekega modula. V slovenskem prostoru dobro poznan Moodle na primer zbira podatke o nekem predmetu, sledi aktivnosti učečega, njegovim interakcijam, oddaji nalog, prezentacijam ali kvizom.

Nadalje Russom (2011) poudarja vlogo masovnih podatkov za višjo kakovost izobraževanja, pri čemer se usmerja predvsem na visoko šolstvo. Skrb za kakovost v tem sektorju je predvsem posledica konkurence med visokošolskimi zavodi, postopkov akreditacije, evalvacije in različnih drugih regulacij, pa tudi, kot navaja Blažič (2021, str. 94), konkurenčnega trga dela. Hmelak idr. (2020, str. 147) dodajajo, da je kakovost študija odvisna tudi od časa in prostora, ne nazadnje pa se morajo visokošolske institucije odzivati tudi na nenehne spremembe v družbi. Presoja kakovosti temelji na analizi podatkov, ki se zbirajo prav v vseh vzgojno-izobraževalnih ustanovah, prav tako pa se med zaposlenimi dviguje zavedanje, da so vzgojno-izobraževalne ustanove odgovorne za zadovoljstvo in uspeh študentov ali drugih učečih se.

Masovni podatki po avtorjih Amershi in Conati (2009) vodijo v učinkovito odločanje, saj omogočajo zaznavanje, razumevanje, analizo in napovedovanje ravnanj učečih se, njihovega napredka in učnih izidov. Med procesom učenja in poučevanja v virtualnem okolju se lahko analizira vedenje učečih se med opravljanjem neke aktivnosti, lahko se analizira participacijo, diskusije na forumih in prav s tem se lahko pridobijo informacije o močnih področjih in šibkih točkah učečih se. Še več, Bichsel (2012) trdi, da morajo vzgojno-izobraževalne ustanove nujno investirati v profesionalne analitike, ki bodo pomagali definirati ključna vprašanja v celotnem procesu do točke, ko bodo razvili podatkovne modele za oblikovanje in informiranje o nevralgičnih točkah, priporočilih in poročilih.

Slabosti masovnih podatkov

Med najpogostejšimi izzivi v povezavi z masovnimi podatki se omenjajo: varnost, zasebnost, hranjenje podatkov in vizualizacija (Bamiah idr., 2018).

Z vidika varnosti se pri masovnih podatkih pojavljajo varnostni zadržki, ki se tudi sicer omenjajo v povezavi s spletno varnostjo, tudi zato, ker se kaže, da tradicionalne varovalne strategije (gesla, požarni zidovi, protivirusni programi) niso več dovolj. Z vi-

dika masovnih podatkov in izobraževalnih ustanov pa se dodatno poudarja še pomanjkljiva določila glede intelektualne lastnine, pa tudi dostopa do podatkov ter njihovega hranjenja, obdelave in analize (Daniel, 2014).

Nadalje se pojavi še vprašanje zasebnosti. Masovni podatki v izobraževanju so namreč transparentni, saj pretežno razkrivajo identiteto učečega se. Tako se v okviru MOOC-ov (angl. Massively Open Online Courses) zbirajo, centralizirajo in analizirajo podatki učečih se udeležencev, ki pa lahko hitro postanejo predmet zlorabe (Young, 2015). Raba masovnih podatkov se poleg iskanja načinov za ohranjanje zasebnosti dotika tudi drugih etičnih izzivov, npr. vprašanja posameznikove privolitve, lastništva podatkov in transparentnosti. Pojavijo pa se tudi vprašanja o avtentičnosti uporabnikov, pooblaščenosti oseb za dostop do podatkov in namenu uporabe, npr. ali gre na primer za sisteme napovedovanja, ki povezujejo demografske podatke s preteklimi in z zdajšnjimi učnimi dosežki, za angažiranost za delo s spletnimi materiali ali prisotnostjo, končnimi učnimi izidi itn. (Wang, 2016).

Pomemben izziv za rabo masovnih podatkov je tudi pomanjkanje ustrezno kompetentnih strokovnjakov (Bamiah idr., 2018). Russom (2011) celo meni, da je prav to največja ovira pri rabi in nadaljnjem razvoju masovnih podatkov. Pri tem je treba omeniti, da morajo strokovnjaki za rabo masovnih podatkov na področju izobraževanja znati pridobivati, analizirati in smiselno uporabiti podatke, hkrati pa morajo tudi znati identificirati konstrukte, ki se vsebinsko navezujejo na področje vzgoje in izobraževanja.

Z masovnimi podatki se seveda odpira tudi vprašanje hranjenja in analize podatkov ter ravnanja z njimi. Izobraževanje ustvarja ogromne količine podatkov v sklopu LMS, spletnih repozitorijev, digitalnih knjižnic, informacijskih sistemov, družabnih medijev, posameznih računalnikov in administrativnih sistemov, ki vključujejo informacije o predmetih in programih, učnih poteh itn. Ti podatki so zbrani v različnih formatih, kar je izziv za integracijo in hranjenje, pojavi pa se tudi vprašanje kakovosti teh podatkov, predvsem v povezavi z robustnostjo v oblikovanju meril za njihovo izbiro (Bamiah idr., 2018).

Baig idr. (2020) so pripravili sistematični pregled literature na področju rabe masovnih podatkov v izobraževanju. Ugotavljajo, da se je v pedagoškem raziskovanju trend uporabe masovnih podatkov pojavil leta 2014 in se znatno povečal v letu 2017. Identificirali so štiri najpogostejše teme, ki so bile naslovljene z rabo masovnih podatkov. Prva taka tema je bila vedenje in dosežki učencev, znotraj katere so avtorji ugotavljali odnos učencev, njihovo zadovoljstvo, strategije, vedenje, pri čemer so se naslanjali na učno analitiko. Druga najpogostejša tema je bila modeliranje in hranjenje izobraževalnih podatkov. Gre za študije, ki so uvedle modeliranje z masovnimi podatki in analizirale orodja za analizo teh podatkov, skupaj s "skladišči" podatkov. Raziskovale so okolje oblaka za shranjevanje podatkov ter uporabile klastrsko analizo za ugotavljanje dostopnosti in obdelovanje podatkov s področja vzgoje in izobraževanja. Tretja tema je bila izboljšanje izobraževalnega sistema. Te študije so se usmerjale v analizo statističnih orodij in meritev ter z njimi povezanih izzivov, pa tudi v učinkovitost informacijsko-komunikacijske tehnologije in rabo spletnih strani kot vira za izboljšanje izobraževalnega sistema. Zadnje področje, ki so ga avtorji poudarili, je vključitev masovnih podatkov v kurikulum. Gre za študije, ki vključujejo tematike masovnih podatkov v različne predmete in poudarjajo vlogo masovnih podatkov za izobraževanje.

4 Sklep

V prispevku smo se najprej osredinili na sekundarno analizo podatkov, za katero ugotavljamo, da ima številne prednosti, med katerimi gre poudariti predvsem dejstvo, da so podatki že zbrani in da raziskovalec tako prihrani čas za pripravo instrumenta za zbiranje podatkov kot tudi za zbiranje podatkov, kar je dragoceno z vidika raziskovalcev začetnikov in tudi zelo koristno za študente, ki začenjajo raziskovanje. Sekundarno analizo podatkov odlikuje tudi možnost, da se podatke analizira z drugega zornega kota, da se torej postavi drugačna raziskovalna vprašanja, pa tudi, da se analizo lahko nadgradi z naprednejšimi načini obdelave podatkov, kar seveda pripomore h kompleksnejšim znanstvenim spoznanjem. Na tem mestu bi poudarili, da so tudi v Sloveniji na voljo podatki nacionalnih študij (npr. PISA, TIMMS), ki jih hrani Pedagoški inštitut, nekateri podatki drugih študij pa so na voljo tudi na spletni strani Arhiva družboslovnih podatkov. Velja pa seveda izpostaviti tudi zadržke pri sekundarni analizi podatkov, predvsem da se mora raziskovalec zavedati, da so lahko podatki tudi napačni in da se mora vsakič znova vprašati, ali podatki, ki primarno niso bili zbrani za cilje njegove raziskave, dejansko lahko odgovorijo na zastavljena raziskovalna vprašanja.

V drugem delu smo več prostora namenili masovnim podatkom, za katere ugotavljamo, da se v pedagoškem raziskovanju kljub pomembnim prednostim njihova vloga in vrednost uveljavljata le počasi. V praksi se masovne podatke največkrat upravlja v smislu rudarjenja podatkov za t. i. institucionalne evalvacije, npr. reakreditacije, samoevalvacije itn., torej predvsem v terciarnem izobraževanju. Uporabljajo pa se tudi za napoved dosežkov, raziskovanje vedenja, sledenje prisotnosti/odsotnosti, priporočila za izvedbo predmetov, takojšnjo pomoč in ocenjevanje, za vizualno analitiko učenčeve interakcije v diskusiji znotraj foruma, povečano dostopnost izobraževanja, raziskovanje in razvoj. Predvsem vidimo prednosti tega pristopa v:

- rabi učne analitike za prilagajanje poučevanja sposobnostim učencev in razpoložljivim virom;
- napovedovanju prihodnjih dosežkov učečih se in iskanju vzorcev za identifikacijo dejavnikov tveganja za neuspeh ali opuščanje šolanja;
- evalvaciji;
- v višji dostopnosti izobraževanja, pripomore pa lahko tudi k izboljšanju raziskovanja, evalvaciji in odgovornosti.

Tina Štemberger, PhD

Secondary Data Analysis and Big Data in Educational Research

The paper addresses two concepts which appear more and more often in general professional discussions, but that have not yet received sufficient attention in educational research in our country, which is why they are less known, less used and modestly implemented. The first part of the paper focuses on secondary data analysis, which is not a new phenomenon (see for example Kozina et al., 2012, p. 136; Kunčič et al., 2013, p. 48;

Čepar et al., 2022, p. 132). Basically, secondary data are defined as data that someone has previously collected and used (Smith, 2008), with Schutt (2007) stating that this applies even if the data are reused by the same person or group of people that collected and processed the data. It follows that it is not always possible to draw a clear line between primary and secondary data. Therefore, Jary and Jary (2000, p. 540) propose a more general definition of secondary data analysis, namely that it is any research based on the re-analysis of previously analysed data. As Glaser (1963) pointed out decades ago, by using secondary data we not only save time and money, but also preserve careers, research interests and self-image, and thus in a sense "save" huge amounts of data from being lost.

Smith (2008) also states that secondary data can provide opportunities to develop new research ideas, such as discovering different relationships, associations, or differences than were hypothesized in the primary research. It is further emphasized that secondary data are usually of high quality and highly available from a financial perspective (Hakim, 1982; Smith, 2008; Yorke, 2011). These two aspects are important because data collection can be a very costly process in many cases and therefore access to high-quality data is important for both novice and more experienced researchers, because it allows them a high degree of research independence. By omitting the data collection phase, both novice researchers and students can gain valuable experience conducting independent research in an area of interest and have the opportunity to publish the results. Smith's (2008) main objection to the use of secondary data is that existing databases may contain many errors and that social science data are "reduced" to numbers that cannot reflect the complexity of such phenomena.

In recent years, there is a clear trend towards the use of Big Data, which is hardly known in the educational field in our country, but this is also the case in many other countries (Smith, 2021). Big Data can be defined in different ways, but basically it is a term for large amounts of structured and unstructured data (Smith, 2021). Brands (2014) defines Big Data as the process of combining enormous amounts of differently collected data, which are analysed using complex algorithms, with the goal of providing information for the decision-making process.

The fact is that digitization – also as a result of COVID-related emergency distance learning – is increasingly entering education, and thus enabling the collection and multiplication of digital data that can be used to research learning and teaching and, ultimately, to increase the efficiency of the educational process. The widespread use of e-environments, forums, online conversations, online classrooms with open educational resources (OER), and the use of smartphones for learning greatly increase the amount of data already collected, while research approaches are still quite traditional.

In realizing the potential of Big Data in education, the concepts of Educational Data Mining (EDM) and Learning Analytics (LA) are particularly important, based on which the behaviour and performance of learners can be studied. They enable the analysis of the learning process by examining interaction in the learning environment through an automated interactive platform, such as Learning Management Systems (LMS), Intelligent Tutoring Systems (ITSs) (Prakash et al., 2014). Educational data mining is used to find new patterns, algorithms and models, and is based on both the principles of statistical methods and the data mining methods. Data can be explored to design adaptive learning systems that can support the learning process. Learning analytics refers to the measurement and analysis of large databases and their contexts

with the goal of improving learning outcomes (Prakash et al., 2014). Learning analytics involves interpreting these databases and presenting data with tools (e.g., visual) that can predict future performance and identify potential weaknesses (Yu and Wu, 2015) or lead to the collection and sampling of data on students' interest, their behaviour, use of teaching aids, habits, use of language, attention span, academic performance, etc. (Beneito-Montagur, 2017; Jarke and Breiter, 2019). Keržič (2022) states that learning analytics is an intertwining of computer and statistical sciences with learning and behavioural theories, and involves the measurement and collection of data generated during instruction as well as their analysis, which is adapted to define the learning processes based on them. When education partly or in whole takes place with the use of digital technologies and online platforms, learning analytics generates a lot of data about it (Oi et al., 2017), which enables the teacher to immediately access the data on students' learning performance and participation patterns, so that he or she can provide immediate feedback to the learner (Black and William, 2018). Timely and naturally constructive feedback can have a significant impact on the learner's further behaviour, providing additional encouragement and guidance (Zheng and Bender, 2019). The data also allows the teachers to analyse their own teaching methods and thus encourage them to make changes to their own teaching practice in terms of adapting the process to the needs and demands of the students.

In addition, Russom (2011) emphasizes the role of Big Data for higher quality education, which is mainly discussed at the level of higher education. Concern about quality in this sector is primarily a result of competition among higher education institutions, accreditation procedures, evaluation and other regulations. Quality assessment is based on an analysis of data collected across educational institutions, and the employees' awareness that higher education institutions are responsible for student satisfaction and success.

Some of the most common challenges associated with Big Data are: security, privacy, data storage and visualization (Bamiah et al., 2018). The security concerns with Big Data are mainly related to the general online security issues, also because it appears that traditional security strategies (passwords, firewalls, antivirus programs) are no longer sufficient. From the perspective of Big Data and educational institutions, the insufficient regulations on intellectual property, as well as access to data and its storage, processing and analysis are additionally emphasized (Daniel, 2014).

Furthermore, the issue of privacy also arises; Big Data in education is transparent, as it mainly reveals the identity of learners. For example, in the context of MOOCs (Massively Open Online Courses), learners' data is collected, centralized and analysed, but can quickly become an object of misuse (Young, 2015). In addition to the question of how to preserve privacy, the use of Big Data also raises other ethical challenges, such as issues of individual consent, data ownership and transparency. There are also questions about the authenticity of the users and those authorized to access the data, as well as questions about the intended use, such as whether there are predictive systems that link demographic data to past and present learning performance, engagement to work with online materials or presence, final learning outcomes, etc. (Wang, 2016).

An important challenge in using Big Data is also the lack of sufficiently competent experts (Bamiah et al., 2018). Russom (2011) even believes that this is the biggest obstacle in the use and further development of Big Data. Experts in the use of Big Data

in education need to be able to collect, analyse and meaningfully use data, while also being able to identify constructs that are substantively related to education.

For secondary data analysis, we can sum up that it has many advantages, including the fact that the data has already been collected, which saves the researcher time not having to prepare the instrument for data collection and perform the data collection itself, which is valuable from the point of view of novice researchers and also very useful for students beginning their research. Secondary data analysis is also distinguished by the possibility of analysing the data from another point of view, so that different research questions can be proposed, as well as by the fact that the analysis can be extended with more advanced methods of data processing, which naturally contributes to more complex scientific findings. At this point, we would like to point out that in Slovenia data from national studies (e.g., PISA, TIMMS) are also available, which are kept by the Slovenian Educational Research Institute, while some data from other studies are also available on the website of the Social Science Data Archive. However, it is also necessary to point out caveats in secondary data analysis, especially that the researchers must be aware that the data might be wrong and that they must ask themselves every time whether the data, which were not primarily collected for the purposes of their research, can actually answer the research questions posed.

Regarding Big Data, we conclude that their role and value in educational research has been slow to take hold, despite the significant benefits. In practice, Big Data are most often managed in terms of data mining for so-called institutional evaluations (e.g., reaccreditation, self-evaluation, etc.), i.e., mainly in tertiary education. They are also used for performance prediction, behavioural research, attendance/absence tracking, course recommendation, instant help and assessment, visual analytics of student interaction, forum discussions, improved access to education, research and development. Above all, we see the benefit of this approach in:

- *using learning analytics to match instruction to student abilities and available resources;*
- *predicting future learner performance and looking for patterns to identify risk factors for failure or dropping out of school;*
- *evaluation;*
- *its contribution to greater educational accessibility and improved research assessment and accountability.*

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Preschool Teachers' Job Satisfaction

Prejeto 3. 2. 2023 / Sprejeto 16. 6. 2023

Znanstveni članek

UDK 373.2-051:331.101.32

KLJUČNE BESEDE: vzgojitelji, poklicna identiteta, delovne izkušnje, smisel pri delu, zadovoljstvo pri delu

POVZETEK – Ključna vloga vzgojitelja se nanaša na njegove poklicne in osebne kompetence, ki jih vsakodnevno uporablja v praksi. Kot odziv učitelja na posamezne vidike njegovega dela se pojavi zadovoljstvo z delom, ki ima lahko pozitiven ali negativen predznak, odvisno od učiteljeve ocene. Cilj raziskave je vpogled v percepcijo delovne vloge in zadovoljstvo z delom vzgojiteljev v vrtcih. V raziskavi je sodelovalo 536 vzgojiteljev, dve vprašanji odprtega tipa pa sta bili sestavni del anketnega vprašalnika, v katerem so morali našteti tri izkušnje pri delu, s katerimi so bili najbolj zadovoljni, in tri, s katerimi so bili najmanj zadovoljni. Rezultati, pridobljeni z metodo kvalitativne analize, kažejo, da vzgojitelji kot glavne vire zadovoljstva pri svojem delu navajajo neposredno delo z otroki, uspeh in napredek otrok ter odnose z drugimi vzgojitelji, strokovnimi sodelavci in starši. Največji viri nezadovoljstva vzgojiteljev so povezani z neprimernimi delovnimi pogoji in slabim položajem v družbi ter odnosom družbe do poklica vzgojitelja. Dobljeni rezultati so prispevek k profesionalnemu razvoju vzgojiteljev z namenom izboljšanja kakovosti njihovega dela in osebnega razvoja.

Received 3. 2. 2023 / Accepted 16. 6. 2023

Scientific paper

UDC 373.2-051:331.101.32

KEYWORDS: job meaningfulness, job satisfaction, preschool teachers, professional identity, work experiences

ABSTRACT – The key role of preschool teachers relates to using their professional and personal competencies in daily practice. Depending on the teachers' assessment, their job satisfaction reflects either a positive or a negative response to specific aspects of teaching. This research aims to provide insight into preschool teachers' perception of their job role and job satisfaction. A total of 536 teachers participated in the survey and answered two open-ended questions in which they were asked to list three of the most and least satisfying experiences at work. The results obtained by the method of qualitative analysis have shown that preschool teachers see the main sources of job satisfaction in their direct work with children, in the success and progress of children, and in their relations with fellow teachers, expert staff and parents. The biggest sources of dissatisfaction include inadequate working conditions, low status in society, and the attitude of society toward the teaching profession. The results obtained contribute to the professional development of preschool teachers with the aim of improving their work quality and personal development.

1 Introduction

The fundamental role of early childhood and preschool education is to create optimal conditions that will enable the quality development of preschool-age children. According to the 2030 Agenda, every boy and girl must enjoy access to high-quality preschool education, and the preschool teacher is a decisive factor in the educational process. The teacher's key role relates to using their professional and personal competencies in daily practice, thus creating a dynamic pedagogical process. Moreover, critical attitudes toward educational practice and continuous reflection and learning provide teachers with space for their professional growth and development (Maksimović and Osmanović, 2018). In this respect, job satisfaction presents the teachers' response to specific job aspects and can be either positive or negative depending on the teachers'

assessment of their job and the institution's management. In other words, job satisfaction refers to how an individual feels at work and how the heads of the organization meet the needs of their employees (Slišković et al., 2016). The principals of educational institutions that focus on job satisfaction will foster a supportive environment as they understand that this can affect the institutional culture (Starc, 2015). Neutrality does not go along with professional engagement. As some authors claim (Čotar Konrad and Kukanja Gabrijelčič, 2014; Erdamar and Demirel, 2016), teaching implies an emotional context because the participants are emotionally involved in mutual relations. Teachers' positive work attitude and enthusiasm are reflected in their work with children, colleagues and parents. It has been shown that a job which creates a sense of pleasure, enjoyment or satisfaction motivates preschool teachers to enjoy working and look forward to coming to work, which consequently affects the quality of their educational work (Kafetsios and Zampetakis, 2008; Tatalović Vorkapić and Jelić Puhalo, 2016; Tatalović Vorkapić and Lončarić, 2013).

A comparison of the available literature on the job satisfaction of professionals who work with children has shown that much research has been done on class teachers, while preschool teachers have been involved to a lesser extent. Factors that have been shown to increase job satisfaction include positive relationships with children, interaction with fellow employees, a competitive salary, job security, the organizational environment, a positive atmosphere, and connection, cooperation and collegiality (Bhamani, 2012; Lambert et al., 2016; Tatalović Vorkapić and Jelić Puhalo, 2016). Maforah (2015) adds the factors of working conditions and preschool teachers' autonomy. The absence of these components creates an environment that can cause stress, which has also been confirmed by the research conducted by Dolenc and Virag (2019). However, whenever the mentioned components are fulfilled, preschool teachers' job satisfaction increases, which contributes to the well-being of the entire staff of the educational institution, to the overall cohesion, and to the improvement of the status of the preschool teachers' profession. In addition to teacher turnover, examining teacher job satisfaction can reveal different benefits or problems they have at work, which is why the paper focuses on the perspective of preschool teachers.

Job satisfaction is a multidimensional concept and different researchers have defined it in different ways. Wang, Lin and Liang (2017) claim that job satisfaction originates from the teachers' comparison of job expectations with real results, and implies teachers' reactions to work. According to some authors (e.g., Kafetsios and Zampetakis, 2008; Tabancali, 2016), job satisfaction reflects an individual's overall assessment of where they work and of their job as a whole. Another way of describing job satisfaction relates to the teacher's feelings about the job or about how their needs are met in the workplace. The teacher shows either positive or negative feelings toward the job, and those feelings may be somewhat independent. Research has shown that teachers have a high level of energy and enthusiasm, focus and work engagement, which speaks in favor of a positive affective state (e.g., Erdamar and Demirel, 2016; Kafetsios and Zampetakis, 2008). On the contrary, negative feelings are characterized by repulsion or dislike for the workplace, where various negative emotions can occur (Kafetsios and Zampetakis, 2008). Sources of preschool teachers' dissatisfaction related to job responsibilities, i.e., increasing the workload, were also recognized. Some of the consequences of job dissatisfaction are withdrawal and lack of productivity, which lead to changes in

the workplace as a whole (Grant et al., 2019; Spector, 1997). More recent studies (e.g., Grant et al., 2019; Tatalović Vorkapić and Jelić Puhalo, 2016) indicate a correlation between the mental health of early childhood and preschool teachers, their job satisfaction, and the quality of their interaction with children.

Generally, when job satisfaction reflects an opinion about work and its various aspects, it refers to the degree to which a person likes (satisfaction) or dislikes (dissatisfaction) their job. Job satisfaction can be considered a global feeling about the job or a related constellation of attitudes about different job aspects.

In addition to the individual's attitude, job satisfaction also has a component of expectation. Teachers reflect on their experiences at work, and work assignments are closely related to their individual job expectations. Spector (1997) mentions several main reasons for job satisfaction, primarily treating employees with respect and fairness, thus creating a positive attitude and a sense of well-being. This relates to the approach that the heads of the organization take toward employees as this affects the organization's operations, either positively or negatively. Employees' feedback on job satisfaction is also considered important because it helps identify the areas requiring improvement. Furthermore, the principals of educational institutions need to know the effects of job satisfaction to avoid the factors that can affect the institutional culture and lead to low productivity and a high staff turnover rate. Stressful requirements, poor working conditions and a lack of professional recognition can be predictors of job dissatisfaction and turnover rates (Farewell et al., 2022; Torquati et al., 2007).

Finally, it should be pointed out that the job satisfaction of employees in educational institutions is crucial for the long-term growth and development of any educational system in the world (Bhamani, 2012) and requires the support and attention of society, researchers and educational policy makers (Lambert et al., 2016). However, most research in this area is much more focused on various other institutions and the business world, while few studies cover the field of early childhood and preschool education and care (Grant et al., 2019), which is an important reason for addressing this issue in the paper.

Based on what has been presented in the paper, we start from the definition of job satisfaction (Evans, 1997, p. 328), which recognizes the two main components of job comfort (how (un)satisfying the conditions and circumstances at work are for the individual) and job fulfillment (the level of an individual's (dis)satisfaction with personal achievements within significant job aspects) and includes "a state of mind determined by the extent to which the individual perceives his/her job-related needs to be met".

2 Research methodology

Research aim and questions

This research is part of a larger study aimed at examining some of the characteristics of the job of preschool teachers. The main goal of this research is to complement and deepen the results of the quantitative part of the study by analyzing teachers' experiences (experienced situations) related to their job satisfaction. As pointed out in the previous chapter, the theoretical framework within which the qualitative part of the

study was designed is based on some aspects of job satisfaction. Job satisfaction and job meaningfulness are considered key prerequisites for making decisions about leaving or keeping a job, and different experiences and situations at work generally play a significant role in the life of the professional. Namely, the experience of job satisfaction generates life satisfaction and can result in better productivity and creativity (Keleş and Findikli, 2016; Slišković et al., 2016). In this context, the *aim* of this research is to gain an insight into the perception of teachers' job satisfaction in their daily work in preschool institutions. In line with the aim and the theoretical framework, two *research questions* were formulated in the paper:

- What are the aspects of preschool teachers' job satisfaction in their direct educational practice with children?
- What are the aspects of preschool teachers' job satisfaction in their relations with fellow teachers, expert staff, principals and parents?

Participants

A total of 536 preschool teachers participated in the survey. As for their work experience in preschool institutions, the majority have up to five years of service (39.9 %), followed by 5 to 15 years (28.7 %), 16 to 25 years (18.2 %), while the percentage of teachers with 26 and more years of service is the lowest (13 %). As for their professional qualifications, the majority of teachers have a college degree (73.13 %), followed by those with a university degree (23.70 %), while 2.42 % of teachers finished secondary education.

Research instrument and the way of conducting research

The survey was conducted in 2021/2022 in an online environment (via Google Forms) and its participants were teachers working in preschool institutions in the city of Zagreb and Zagreb County. For the purpose of conducting this survey, two open-ended questions were formulated, in which teachers were asked to list three of the most and least satisfying experiences/situations at work.

Research methods

Since teachers were asked to list three of the most and least satisfying experiences/situations at work, their answers to the two open-ended questions were analyzed using the method of qualitative analysis. The collected data were analyzed as follows: the units of analysis consisted of all answers about the highest satisfaction or dissatisfaction. In this way, two units of analysis were created, containing the responses of individual research participants (or parts of the responses) defined as coding units. Initial codes representing the first level of data abstraction were attached to the coding units. After initial coding, all codes were revised and classified into parent categories according to the similarity in meaning. In further analysis, the original categories were revised and grouped according to similarity. Some categories were reduced, i.e., analytically merged with other categories, or expanded, i.e., subcategories were created. This process depended on the data quantity and quality, which means concrete, clear and broader descriptions in participants' answers. This was followed by a revision of the categories, and their merging and organizing into themes.

3 Results and discussion

Data analysis was approached thematically. In accordance with the defined research questions, the analysis of the research results included two content and thematic units related to teachers' job satisfaction through their most and least satisfying experiences and situations at work:

- in their direct educational work with children and
- in their relations with fellow teachers, expert staff, principals and parents.

To demonstrate the representation of the same elements of satisfaction and dissatisfaction, the above data can be observed with respect to their mutual relations. Therefore, they were elaborated and presented through the following themes and their corresponding sub-themes:

- Theme 1: *Preschool teachers' job satisfaction related to children*
  - Sub-theme1.1: S*atisfaction with their work and relationship with children, satisfaction with children's activity and interest;*
  - Sub-theme 1.2: *Feeling their own success through the child's progress.*
- Theme 2: *Preschool teachers' job satisfaction related to cooperation with other teachers, expert staff and parents*
  - Sub-theme 2.1: *Positive feedback;*
  - Sub-theme 2.2: *Challenges in relationships;*
  - Sub-theme 2.3: *A sense of personal fulfillment at work;*
  - Sub-theme 2.4: *A desire for continuous learning and professional development*.

Preschool teachers' job satisfaction related to children

When addressing the work situations and experiences they are most satisfied with, teachers mostly describe working with children, more specifically activities with children, relationships with children, certain characteristics of children's behavior and children's progress, which are all interconnected elements. An analysis of participants' answers shows they find satisfaction in working with children which includes mutual warm emotions. These are some examples: "*I am pleased when my children show me love and trust…*"; "*My heart is completely filled with joy when it comes to children and anything related to children and creativity.*"; "*Children's hugs when I come to work...*"; "*When a child welcomes me with open arms and a smile on their face.*". Furthermore, when it comes to the child's active behavior as one of the important sources of satisfaction, teachers mention the child's natural desire to participate in joint play and learning, as well as their willingness to engage and accept the planned suggestions and activities, but also the importance of children's ideas ("*Their ideas impress me every time; sometimes when preparing the material we imagine the situation might work in one way, but then the children take us into a completely new, different direction.*"). In addition to the natural motivation of children to participate in activities, teachers point out other positive characteristics such as the child's curiosity, openness, cheerfulness and desire to explore and learn ("*Children's openness, smiles, the wonder in their eyes.*"). The majority of teachers' answers show that children are the most important factor of their job

satisfaction, yet certain characteristics of children's behavior represent possible sources of dissatisfaction. For example, teachers highlight some children's lack of cooperation and interest in activities in the educational group: "*There are problems with aggressive and disinterested children.*"; "*... and an increasing number of hyperactive children who fail to concentrate on the activity.*".

A great source of job satisfaction is also the teachers' feeling of success through the children's progress and the direct recognition of the children's implementation and realization of anything related to the educational process ("*When I see children developing and progressing before my eyes.*"; "*I am happy with the results of my personal engagement and work with a child with special needs.*"; "*When I feel that I am "the wind at the children's backs" and their support in things they find difficult to do, and when I see that they have made progress.*"; "*When a child told me "you have taught me this".*"). The analysis of teachers' answers shows that their satisfaction is conditioned by the fact that they can help children, which reflects the teachers' motivation and desire to contribute to early childhood education and care and the child's overall well-being. Concerning their (lack of) success in working with children, teachers mention the complexity of working with certain children and inadequate working conditions ("*Having too many children in the group makes it harder to approach the child individually, which makes it difficult to work.*"; "*I feel dissatisfied when I cannot provide each child with as much as I should.*"; "*Obsolete principles of work, not much or almost nothing has been digitized – tedious and boring administration and red tape, so I cannot devote myself to the children as much as I would like.*"). In the context of concerns related to working with children, teachers emphasize possible children's injuries ("*When a child is at risk, or injuries, accidents, conflicts are the hardest for me, because I am responsible, and I feel the worst in such situations.*"). It is interesting that when offering these answers, teachers also indicate possible solutions, such as reducing the number of children in educational groups and having more than two teachers working in the same shift, thus highlighting their own satisfaction and individualized approach, as well as the safety of children and meeting their basic existential and psychological needs.

Preschool teachers' job satisfaction related to cooperation with fellow teachers, expert staff and parents

When it comes to job satisfaction related to colleagues, the participants primarily emphasize collegial and friendly relations at work. Furthermore, their answers show they value cooperation and support received from fellow teachers, but also from the expert staff and the principal ("*I am also satisfied with the professional support and friendliness of the expert team, my fellow teachers, and the positive and professional working atmosphere in the kindergarten where I work.*"). They stress the importance of collegiality, teamwork, a motivating working atmosphere, as well as good overall interpersonal relationships ("*I can discuss anything with my work colleagues, exchange experiences. Teachers have established successful cooperation with the principal and the expert staff.*"; "*I am very pleased when we cooperate as a team.*"; "*Support of the expert staff, a supportive and positive relationship in the team.*"; "*Teamwork in the relationship with my colleagues.*"). In particular, teachers express their satisfaction with the positive feedback they receive from other stakeholders in education. They are pleased when their peers show them appreciation and accept their ideas, and when they are en-

gaged and active ("*I am satisfied when I have a colleague who is open to cooperation, who is on a similar "level" and is willing to work and exchange information...*"; "*I am satisfied when my suggestions on working arrangements are appreciated, praised or met with a positive and constructive criticism, with an emphasis on cooperation.*"). On the other hand, teachers' job dissatisfaction originates from poor relations in the work team, i.e., with fellow teachers, expert staff and the principal. When it comes to dissatisfaction with the support of superiors, participants mention the principal's lack of understanding and lack of support in some initiatives, emphasizing excessive control and distrust or disrespect ("*When the principal does not appreciate what we do; we want to educate ourselves, and they make it impossible.*"; "*The pressure coming from the principal that sometimes makes me feel scared and anxious.*"). In this regard, teachers also see a source of dissatisfaction in the lack of support of the expert staff, and to some extent they resent the expert staff for approaching them from the position of superiors ("*When the expert team acts as a hierarchical superior and as superior experts, instead of co-experts.*"). Teachers lack concrete assistance and support coming from the expert staff in problem situations, an appreciation of teachers and their competencies, and a general understanding of their work ("*When the expert staff act as if we teachers are not professionals but less educated staff.*"). Dissatisfaction also comes from the expert staff's criticism and direct control over their work ("*I am not satisfied with the relationship between the expert team and teachers. They should offer assistance and support, not supervision.*").

In the context of job satisfaction and cooperation with the stakeholders in education, most teachers highlight the importance of their partnership with parents. An analysis of teachers' answers has shown that positive parental feedback on teachers' work is related to job satisfaction ("*I am happy to see that parents are satisfied and tell us that the child feels comfortable in kindergarten.*"; "*I care about information from parents when they express satisfaction with the child's happiness and joy in attending kindergarten.*"). Furthermore, teachers feel satisfied when they can help parents raise their children, offering them their knowledge and advice. Teachers feel that parents have confidence in them, which in turn creates a partnership with the parents ("*I am most satisfied when I achieve a partnership with parents, when we work together for the benefit of the child, and when we succeed.*"). Furthermore, it is always a pleasure for teachers when they receive direct support and positive feedback from parents and members of the expert team, which gives them the feeling that they are recognized as experts and competent professionals ("*When I am perceived as competent and educated by parents and the expert team.*"; "*I am satisfied when my suggestions at parent-teacher conferences are met with appreciation, praise, or a positive and constructive criticism with an emphasis on partnership. And when the parents respect me as a teacher and as a person.*"). On the other hand, teachers point out certain dissatisfaction that generally comes from poor relations with parents, i.e., possible obstacles and misunderstandings in communication that make cooperation difficult. Kindergarten is a community with its own culture, peculiarities, rules, and certain professional features. Teachers are dissatisfied when parents do not refer to them as professionals ("*When they call me "nanny", I personally consider this a sign of disrespect.*"; "*We are considered babysitters, and kindergarten a place that provides childcare while parents are at work.*"). In addition, teachers emphasize that some parents sometimes do not take their professional opinion

and suggestions seriously ("*It is easier for parents to find an answer on the internet where all sorts of things are available, and they take this information for granted.*"). According to teachers' answers, it is evident that they are dissatisfied with parents' unrealistic expectations and excessive demands, their lack of cooperation that implies a lack of interest on the part of some parents, and with the difficulties in communication ("*They do not have time, they are constantly in a hurry; after kindergarten they take children to after-care programs.*"). When addressing difficulties in communication with parents, teachers warn of their wrong parenting styles ("*Parents are becoming increasingly "worse" – an extremely permissive parenting style.*"; "*Parents are overindulging their children; the children do not want to go home unless the parents buy what they have promised.*"). Teachers also suggest organizing a number of quality lectures and workshops conducted by teachers or members of the expert team, so that parents can find new ways of fulfilling their parental responsibilities for the well-being of the child and their own parental satisfaction. It can be concluded that the teachers who participated in this survey appreciate it very much when their work is publicly recognized and considered valuable, and when they are praised for their success at work.

A part of the participants' satisfaction was also generated and described through their sense of personal fulfillment, achievement, professional progress and satisfaction ("*Putting aside some bad situations, some problematic parents, colleagues, associates... I just can't imagine doing anything else. At work, I feel that I am fulfilling my mission in this earthly world.*"). The teachers are delighted with the progress in their work, which is mostly reflected in the progress of children, but also in the progress of trainee teachers ("*When I feel and see the motivation of students and trainees after working in our kindergarten.*"). In the context of personal fulfillment and achievement, it should be stressed that when teachers talk about their success at work, they are mostly referring to the development and progress of children, which supports the earlier categories of answers indicating that one of the key elements of their satisfaction lies in the progress of children ("*When I design incentives, form a new center, or supplement the existing one with new materials, and the children explore and use the materials with excitement and great curiosity, in accordance with their logic.*"). As already mentioned, it is important for teachers to see and notice the results of their work; to feel personal satisfaction with their work (level of personal achievement and internal motivation), but also to receive recognition from others (parents, expert staff, principals and the wider community). In addition to the above elements, the teachers see a source of their satisfaction also in some of their personal traits and professional qualities, such as creativity, resourcefulness, openness, responsibility and a desire for constant learning and personal development ("*I am satisfied with the symbolic creative process, the quality documentation of the process, and with how the space has been adapted to the needs of children and adults.*"; "*Opportunities for innovation, imagination and creativity at work.*"; "*Professional and personal growth and development through everyday situations with children at work.*"; "*When I educate myself about something new and have the option of continuous education.*").

4 Conclusion

This research aimed to gain an insight into the perception of preschool teachers' job satisfaction in their daily practice in preschool institutions. The first research question focused on determining teachers' job satisfaction in their direct educational work with children. The obtained results have shown that teachers see the main sources of satisfaction in the direct work with children; in the children's success and progress; in the children's interest and desire to participate in activities; in their successful mastery of educational content; in the positive emotional relationship with children; and in happy and satisfied children. The biggest sources of dissatisfaction, according to this research, include inadequate working conditions that relate to having too many children in educational groups, which makes it difficult to approach each child individually and thus provide better professional assistance and support to the more demanding children in educational terms. This is followed by the low status of teachers in society and the attitude of society (and superiors) toward the teaching profession.

As for the second research question, which relates to job satisfaction in relations with fellow teachers, expert staff, principals and parents, the results show that teachers most value supportive and collaborative relationships. In the context of satisfaction, they emphasize the importance of receiving recognition for their work and contribution from parents, expert staff, principals and the wider community. When talking about dissatisfaction, they point out the lack of interest on the part of some parents and permissive parenting styles, which makes communication with parents difficult. Consequently, they emphasize the importance of receiving support and education. Furthermore, teachers mention the lack of support of expert staff as a source of dissatisfaction; they resent the expert staff for approaching them from the position of superiors. In addition to these elements, teachers also see a source of satisfaction in their personal traits and professional qualities, such as creativity, resourcefulness, openness, responsibility and a desire for constant learning and personal development.

According to the available data, in Croatia and worldwide, there is a lack of research on the satisfaction of preschool teachers conducted using the qualitative methodology used in this paper. Therefore, the results of this research have theoretical and practical implications. Principally, the research results are an incentive for gaining a deeper understanding of the possibility of improving initial teacher education, teachers' employment and professional development, and thus improve the quality of preschool teachers' life and work.

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Zadovoljstvo pri delu z vidika vzgojiteljev

Odnos zaposlenih do dela se odraža v njihovem zadovoljstvu z delom, pri čemer velja, da so to občutki, ki jih imajo zaposleni o svojem delu ali določenih vidikih dela (Spector, 1997) oziroma o tem, v kolikšni meri so zadovoljni ali nezadovoljni s svojim delom (Grant idr., 2019). S tem želimo poudariti, da je zadovoljstvo pri delu pogojeno s

tem, kakšen odnos ima oseba do dela, kakšna so njena pričakovanja ter kako in koliko želi pri delu doseči. Pregled literature kaže, da enotne definicije zadovoljstva pri delu ni. Gre za kompleksen konstrukt, ki ga različni avtorji v znanosti različno opredeljujejo. Obstaja več dejavnikov, ki lahko vplivajo na stopnjo zadovoljstva pri delu. Ilyas in Abdullah (2016) poudarjata, da zadovoljstvo pri delu vključuje sledeče elemente: uspešno sodelovanje s sodelavci, naloge, vodenje, organizacijsko strukturo in delovne pogoje. Nadalje se je v eni izmed izvedenih raziskav izkazalo, da povečanje zadovoljstva pri delu pogojuje številne interakcije z otroki, sodelovanje in kolegialnost z drugimi zaposlenimi, varnost zaposlitve ter splošno organizacijsko okolje in pozitivno vzdušje (Edwards in Peccei, 2007).

Delo vzgojitelja velja za izredno občutljivo, zahtevno in odgovorno, pogosto zahteva intenziven fizični in psihični napor. Raziskava avtorjev Pavlović in Sindik (2014) kaže, da viri stresa za vzgojitelje niso neposredno povezani z njihovo primarno vlogo vzgojitelja oziroma z neposrednim delom z otroki, pač pa so to medčloveški odnosi, sodelovanje s starši, administrativna opravila in nasploh slab status vzgojiteljskega poklica v hrvaški družbi. Stres vzgojiteljev je povezan z delovno obremenitvijo, konflikti med sodelavci, slabimi odnosi s starši otrok, časovnimi omejitvami in pritiski (Sass idr., 2011). Druge raziskave, izvedene na manjšem številu vzgojiteljev, kažejo podobne rezultate. Šimić-Šašić, Klarin in Lapić (2011) so izvedle raziskavo, s katero je bilo ugotovljeno, da so vzgojitelji na splošno zadovoljni s svojim delom. Najvišje stopnje zadovoljstva izražajo v kategorijah, ki se nanašajo na neposredno delo z otroki, najmanj pa so zadovoljni z družbenim statusom poklica in številom otrok v vzgojnih skupinah. Eno ključnih vprašanj, s katerimi se sooča sodobno izobraževanje, je, kako podpreti kakovostne vzgojitelje, ki jih v zgodnji predšolski vzgoji in izobraževanju vse bolj primanjkuje.

Raziskave kažejo, da nezadovoljstvo pri delu vodi v umik in pomanjkanje produktivnosti, fluktuacijo vzgojiteljev, kar posledično vodi v zmanjšano produktivnost in spremembe na delovnem mestu (Grant idr., 2019). Podobno raziskava avtorjev Butt in Lance (2005) kaže, da so viri nezadovoljstva vzgojiteljev povezani s kompleksnostjo dela oziroma z naraščajočo delovno obremenitvijo. V tej smeri raziskave avtorjev Gerber, Whitebook in Weinstein (2007) ter Grant, Jeon in Buettner (2019) kažejo na povezavo med duševnim zdravjem vzgojiteljev, njihovim zadovoljstvom pri delu in kakovostjo njihovih interakcij z otroki. Glede na to, da je primarna naloga vzgojitelja vzpostavljanje kakovostne interakcije z otroki, je zadovoljstvo vzgojitelja pri delu izjemno pomembno. Visoka stopnja zadovoljstva vzgojiteljev je povezana s kakovostjo vzgojno-izobraževalnega dela in s tem z izboljšanjem kakovosti življenja otroka v ustanovi za predšolsko vzgojo (Tatalović Vorkapić in Jelić Puhalo, 2016). Sklicujoč se na izvedene novejše raziskave, omenjene avtorice poudarjajo, da tisti otroci, ki so v času zgodnje in predšolske vzgoje in izobraževanja deležni več socialne in čustvene podpore, dosegajo boljše razvojne rezultate.

Če povzamemo vse navedeno, je upravičeno poudariti, da ravno način, na katerega vzgojitelji dojemajo svoje delo, vpliva na njihov odnos do dela. Kadar vzgojitelji svoje delo dojemajo kot naporno ali stresno, so s svojim delom manj zadovoljni in so dlje časa odsotni z dela ter se manj posvečajo svojemu delu. Pomembno je poudariti, da je zadovoljstvo z delom zaposlenih v vzgojno-izobraževalnih ustanovah izrednega pomena za dolgoročno rast in razvoj katerega koli izobraževalnega sistema na svetu (Bhamani, 2012) ter zahteva podporo in pozornost družbe, raziskovalcev in oblikovalcev izobraže-

valnih politik (Lambert idr., 2016). Vendar pa je večina raziskav na tem področju veliko bolj usmerjena v raziskovanje različnih drugih ustanov in poslovnega sveta, le manjši del pa pokriva področje zgodnje in predšolske vzgoje in izobraževanja (Grant idr., 2019), kar je bila spodbuda za izvedbo te raziskave. Raziskovanje zadovoljstva vzgojiteljev pri delu lahko osvetli različne težave ali pa koristi, ki jih imajo pri opravljanju poklica, zato se to delo osredotoča na perspektivo vzgojiteljev. Poleg tega je zadovoljstvo pri delu pomemben dejavnik, ki zahteva dodatno pozornost, hkrati pa je razumevanje in ugotavljanje dejavnikov, ki nanj vplivajo, lahko koristno za uvajanje izboljšav v zgodnjo in predšolsko vzgojo, še posebej v današnjem času, ko so sodobni trendi usmerjeni v zagotavljanje visokokakovostnega okolja za vse otroke (Fiala in Sindik, 2013).

Cilj raziskave, katere rezultati so predstavljeni v tem delu, je bil pridobiti vpogled v percepcijo zadovoljstva z delom vzgojiteljev pri vsakodnevnem delu v ustanovah za predšolsko vzgojo. V raziskavi je sodelovalo 536 vzgojiteljev, dve vprašanji odprtega tipa pa sta bili del anketnega vprašalnika in pri njiju so morali našteti tri izkušnje pri delu, s katerimi so bili najbolj in najmanj zadovoljni. V skladu s tem sta bili zastavljeni dve raziskovalni vprašanji o vidikih zadovoljstva vzgojiteljev pri neposrednem vzgojno-izobraževalnem delu z otroki in o vidikih zadovoljstva vzgojiteljev z odnosi z drugimi vzgojitelji, strokovnimi sodelavci, ravnatelji in starši.

Rezultati, ki smo jih pridobili z metodo kvalitativne analize pri prvem raziskovalnem vprašanju, kažejo, da vzgojitelji navajajo neposredno delo z otroki, otrokov uspeh in napredek, otrokovo zanimanje in željo po sodelovanju v dejavnostih, pozitiven čustveni odnos med vzgojiteljem in otrokom ter srečnega in zadovoljnega otroka kot glavne vire zadovoljstva pri njihovem delu. Zadovoljni so tudi s svojimi osebnimi in poklicnimi lastnostmi, kot so ustvarjalnost, iznajdljivost, odprtost, odgovornost ter želja po nenehnem učenju in osebnem razvoju. Zato poudarjajo pomen opolnomočenja in izobraževanja. Kot največji vir nezadovoljstva so se izkazale neustrezne delovne razmere, ki se nanašajo na preveliko število otrok v vzgojnih skupinah, kar otežuje individualni pristop do vsakega otroka in s tem zagotavljanje kakovostnejše strokovne pomoči in podpore vzgojno zahtevnejšim otrokom, pa tudi slab položaj vzgojiteljev v družbi in odnos družbe (in nadrejenih) do poklica vzgojitelja.

Pri drugem raziskovalnem vprašanju rezultati kažejo, da so za vzgojitelje najpomembnejši podporni sodelovalni odnosi. V kontekstu zadovoljstva poudarjajo pomen tega, da sta njihovo delo in prispevek prepoznana s strani staršev, strokovnih sodelavcev, ravnateljev in širše družbene skupnosti. Pri nezadovoljstvu so poudarjene težave pri sodelovanju in komunikaciji z nekaterimi starši, poudarjajo pomanjkanje podpore strokovnih sodelavcev in dejstvo, da do vzgojiteljev pristopajo s pozicije nadrejenih. Na podlagi navedenega je še posebej pomembno raziskovati in argumentirano obravnavati izzive vzgojiteljskega poklica ter v skladu z rezultati znanstvenih raziskav zagotavljati podporo in spodbujati njegov razvoj. Predstavljeni rezultati te raziskave so prispevek h globlji obravnavi zadovoljstva vzgojiteljev pri delu, hkrati pa tudi oblikovanju priporočil, predlogov in odprtih vprašanj za prihodnje raziskave, katerih cilj je izboljšanje kakovosti življenja in dela vzgojiteljev.

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Moral (Dis)engagement among Higher Education Student-Bystanders in Cyberbullying

Prejeto 15. 2. 2023 / Sprejeto 15. 5. 2023

Znanstveni članek

UDK 364.636:004.738.5

KLJUČNE BESEDE: moralna (ne)zavzetost, spletno nasilje, opazovalci, intervencijski model, študenti

POVZETEK – V študiji smo želeli ugotoviti, kako različne demografske spremenljivke (spol, starost, preživljanje prostega časa na spletu) in mehanizmi moralne (ne)zavzetosti (moralno upravičevanje, minimalizacija škodljivih učinkov, zanikanje ali razpršitev odgovornosti, razčlovečenje) napovedujejo zaznavanje spletnega nasilja pri študentih opazovalcih v skladu z intervencijskim modelom, ki predvideva, da mora opazovalec opraviti pet korakov, da posreduje pri nasilju: opazi dogodek, dogodek si razlaga kot tako resen, da nujno zahteva pomoč, sprejme odgovornost za posredovanje, ve, kako posredovati ali priskrbeti pomoč, in posreduje (Latané in Darley, 1970). Vzorec je vključeval 205 študentov opazovalcev. S pomočjo multiplih linearnih regresijskih modelov smo največ variance (27%) lahko pojasnili pri drugem koraku intervencijskega modela – tj. pri razlagi dogodka kot nujnega in potrebi po nudenju pomoči. Starejši študenti in študenti z manj izraženo dehumanizacijo so pogosteje dojemali spletno nasilje kot bolj resno in bili bolj pripravljeni pomagati. Naše ugotovitve kažejo na potrebo po večjem interesu za raziskovanje vedenja opazovalcev in oblikovanje intervencij pri spletnem nasilju tudi pri študentih.

Retrieved 15. 2. 2023 / Accepted 15. 5. 2023

Scientific paper

UDC 364.636:004.738.5

KEYWORDS: moral (dis)engagement, cyberbullying, bystanders, intervention model, higher education students

ABSTRACT – In our study, we aimed to determine how different demographic variables (gender, age, free time spent online) and mechanisms of moral (dis)engagement (justification, disregarding or misrepresenting injurious consequences, diffusion of responsibility, dehumanization) predict perceptions of cyberbullying among student bystanders, according to the Bystander Intervention Model. The model proposes that a bystander must take five steps in order to intervene: notice the event, interpret the event as an emergency requiring help, accept responsibility for intervening, know how to intervene or provide help, and implement decisions to intervene (Latané and Darley, 1970). Our sample included 205 student-bystanders in cyberbullying. The most variance (27%) was explained in the second step – to interpret the event as an emergency and help. Older students and students with less pronounced dehumanization were more likely to perceive cyberbullying as serious and to help. Our findings suggest a need for greater interest and intervention in the group of cyber-bystanders among this age group of students as well.

1 Introduction

In recent years, the expansive use of electronic devices in the daily lives of higher education students has prompted researchers to look at the darker side of ICT communication – cyberbullying.

Cyberbullying is defined as an aggressive act carried out repeatedly by an individual or group of individuals through an electronic medium (Kowalski et al., 2014). Most studies (e.g., Cappadocia et al., 2013; DeSmet et al., 2016) focused on adolescents, leaving out another important group – higher education students. The reason may be that students at this age are perceived as adults capable of taking care of themselves,

that the influences of the school and home environments are less important, and that "nothing can be done" (Myers and Cowie, 2019). However, as research on the health consequences of cyberbullying and its impact on psychosocial well-being demonstrates (Erişti and Akbulut, 2019; Peled, 2019), there is a need to systematically address these issues and identify the risk and protective factors also in this age group. Especially as the negative consequences (e.g., depression, anxiety, substance abuse, poorer academic performance, suicidality) of cyberbullying in children and adolescents are already well documented (Patchin and Hinduja, 2013; Kowalski et al., 2014).

Most studies among adolescents and higher education students have focused more on the roles of victims and perpetrators (Dou et al., 2020; Tanrikulu and Erdur-Baker, 2021) rather than cyberbullying-bystanders, although bystanders are the largest group and consequently, in a social sense, the group with the greatest social power to stop this bullying (Pečjak and Pirc, 2014, p. 163).

In recent years, researchers have focused on the mechanisms of moral disengagement (MD) in the context of cyberbullying (Lo Cricchio et al., 2021). Given that some authors suggest that targeting cyber-bystanders in cyberbullying prevention efforts can reduce incidents and mitigate harm (e.g., DeSmet et al., 2016; Moxey and Bussey, 2020), our goal was to identify factors that could be acted upon in cyberbullying prevention efforts. We derived from socio-cognitive theory, which considers the interaction between environmental, personal, and behavioural factors. We focused on research that examines MD as an individual factor and the Bystander Intervention Model as a contextual factor (Machackova, 2020).

MD refers to a set of socio-cognitive mechanisms that enable individuals to "turn off" self-sanctions in the form of feelings of shame, guilt, or negative self-esteem that, in principle, occur when they violate their own moral standards (Bandura, 1999). According to Bandura (2002), the most common mechanisms are moral justification, diffusion or displacement of responsibility, disregarding or minimizing the injurious effects of perpetrators, and blaming and dehumanizing victims.

There is ample evidence that MD is one of the most important individual factors explaining involvement in traditional bullying and cyberbullying (Gini et al., 2014; Lo Cricchio et al., 2021). However, Lo Cricchio et al. (2021) caution that these associations are still unclear as the findings are inconclusive. This is particularly true for MD in bystander behaviour. Some studies found no associations between cyber-defending and MD (Allison and Bussey, 2016; DeSmet et al., 2016); others found that mechanisms of MD reduce the willingness to intervene in cyberbullying (DeSmet et al., 2014; Moxey and Bussey, 2020).

Latané and Darley's (1970) Bystander Intervention Model (BIM) has already been operationalized for traditional bullying intervention by Nickerson et al. (2014). Machackova (2020) notes that it is also applicable to cyberbullying incidents as a contextual factor. It refers to five steps that a bystander must take in order to intervene:

- notice the event,
- interpret the event as an emergency requiring help,
- accept responsibility for intervening,
- know how to intervene or provide help, and
- implement decisions to intervene (Latané and Darley, 1970).

In relation to the first step of the model, Heirman and Walrave (2008) noted that cyber-bystanders are unable to see the emotional reactions of victims and therefore often underestimate the severity of the event, which can lead them to remain passive and not take further steps. For the second step, some authors found that the most important predictor of cyber-bystanding were more or less positive attitudes towards cyberbullying (DeSmet et al., 2016) and that cyber-bystanders are more motivated to help if they interpret a cyberbullying event to be very serious (DeSmet et al., 2014). The third step – taking responsibility for intervening – is often diffused in cyberbullying among many cyber-bystanders in an online context (Leung, 2021). The fourth step is knowing how to intervene and Leung (2021) warns that cyber-bystanders may not have enough ICT knowledge to respond appropriately. Only knowledge of effective strategies motivates cyber-bystanders to act (DeSmet et al., 2014; 2016).

Research on bystanders in general, both in traditional bullying and cyberbullying, has shown conflicting results with respect to gender. Some studies found no differences between female and male participants in providing help against traditional bullying and cyberbullying (Barlińska et al., 2013; Machackova et al., 2013); others found that female cyber-bystanders were more likely to defend cyber-victims (DeSmet et al., 2016; Ma et al., 2019; Pečjak and Pirc, 2014, p. 164).

In terms of participant age, some studies on adolescents found that younger students were more likely to intervene than older ones (Ma et al., 2019; Van Cleemput et al., 2014). According to Moxey and Bussey (2020), these contradictory findings may be due to the anonymity of the online environment, which may lead to less pressure to act in a gender- and age-specific manner. We found no studies which would explore the relationship between cyber-bystanders' age and their reactions to cyberbullying events among higher education students.

The relationship between time spent online and involvement in cyberbullying is clearer also among higher education students and younger adults. Findings from multiple studies indicate that more time spent online predicts involvement in cyberbullying (Adebayo et al., 2019; Balakrishnan, 2015). Costello et al. (2017) found that, for cyber-bystanders in particular, time spent online predicted their more frequent intervention in cyberbullying events.

In a meta-analysis by Killer et al. (2019), only two studies of MD and cyber-bystanders among children and adolescents and none among higher education students were included. Therefore, we were interested in examining the relationship between MD among higher education student-cyber-bystanders and their perceptions of the steps of the BIM. Moreover, there is a need to clarify the role of age and gender with respect to the relationship between MD and cyberbullying, since Lo Cricchio et al. (2021) did not find a clear pattern of associations between these variables. In line with the results of the studies presented in the introduction, our research questions were:

- How do demographic variables (gender, age, time spent online) and mechanisms of MD predict each step of the BIM?
- What are the key MD mechanisms that might prevent a cyber-bystander from taking further steps that lead to their reaction?

2 Method

Participants

Our total sample comprised 764 students, but the current study was conducted on a sample of 205 students (71.7 % female, 27.8 % male, 0.5 % undefined) who were identified as cyber-bystanders. The mean age of students was 21.25 years (SD = 2.96).

Instruments

We created an online survey. First, we designed a questionnaire to find out what role students predominantly play in cyberbullying. We followed the form proposed by Cheng et al. (2011) and prepared three versions of the same items. The first referred to cyber-perpetrators (e.g., *In the last six months, I have sent someone an angry, abusive, or vulgar message using a computer or smartphone*), the second to cyber-victims (e.g., *In the past six months, someone threatened and intimidated me on my computer or smartphone*), and the third to cyber-bystanders (e.g., *In the past six months, I saw or learned that someone sent a violent or horrific photo or video to someone using a computer or smartphone*). Participants responded on a 6-point scale: 1 – never; 2 – once; 3 – two or three times; 4 – once or twice a month; 5 – once a week; 6 – more than once a week. A participant was assigned a role if they responded "once or twice a month" to one or more items. The higher the sum of the points within the scale, the more pronounced was the representative of a particular role. The alpha reliability coefficient for the perpetrator scale was 0.81, for the victim scale 0.80, and for the bystander scale 0.90.

The Bystander Intervention Model in Cyberbullying Questionnaire (BIMCQ – Bystander Intervention in Bullying and Sexual Harassment, Nickerson et al., 2014; Slovenian adaptation by Kos, 2021) asks students about their attitudes towards cyberbullying (sensitivity, responsibility and help for the victim) on a 5-point scale (1 – strongly disagree, 5 – strongly agree). The original questionnaire includes 16 items with 5 steps (*Notice the event; Interpret the event as an emergency; Accept responsibility to help; Know how to help; Implement an intervention decision*). On a Slovenian sample of late adolescents, Kos (2021) found four factors (explaining 67.1 % of the variance): *Notice the event* ($\alpha = 0.74$), *Know how to help* ($\alpha = 0.79$), *Interpret the event as an emergency and help* ($\alpha = 0.86$), and *Accept responsibility and help* ($\alpha = 0.82$). The confirmatory factor analysis (CFA) for our sample had an acceptable model fit (CFI = 0.93, RMSEA = 0.07, SRMR = 0.06; Browne and Cudeck, 1993). Internal consistency coefficients were 0.68 for *Notice the event*, 0.80 for *Know how to help*, 0.76 for *Interpret the event as an emergency and help* and 0.84 for *Accept responsibility and help*.

The Moral Disengagement in Cyberbullying Questionnaire (MDCQ) was developed by Kos (2021), based on the Moral Disengagement in Cyberbullying Questionnaire – CBMDQ-15 (Day and Lazarus, 2016) and measures participants' justifications for cyberbullying. The questionnaire consists of 12 items with four factors. CFA was performed in our sample. The fit indices (CFI = 0.96, RMSEA = 0.06, SRMR = 0.04) indicated a moderate model fit. Internal consistency coefficients were low for *Moral justification* (0.49) and *Diffusion of responsibility* (0.59), good for *Dehumanization* (0.76) and excellent for *Disregarding or misrepresenting injurious consequences* (0.85).

Students were also asked to indicate how much of their free time they usually spend online: 1 – none, 2 – up to half an hour, 3 – from half an hour to 1 hour, 4 – 1 to 2 h, 5 – 2 to 4 h, 6 – 4 to 6 h and 7 – 6 or more hours.

Procedure and data analysis

We asked psychology students to send links to the online survey to their friends and acquaintances who attend college, higher education programmes, or universities. Students gave their informed consent to participate in our study. On the last page of the survey, students were given information about call centres and websites about (cyber) bullying. Data were collected in March and April 2021. Confirmatory factor analyses were conducted using the R lavaan package v0.8. Pearson correlations between dependent and independent variables and multiple linear regression (MLR) analyses were conducted in IBM SPSS Statistics for Windows, version 25.0.

3 Results

First, we present the descriptive statistics and intercorrelations between the studied variables (Table 1).

Table 1

Means, SDs and Pearson correlations between dependent and independent variables

	BIM 1	BIM 2	BIM 3	BIM 4	MD 5	MD 6	MD 7	MD 8
BIM-Na	–	0.20⁑	0.16*	0.09	–0.06	–0.09	–0.06	–0.23⁑
BIM-Eb		–	0.43⁑	–0.10	–0.33⁑	–0.34⁑	–0.30⁑	–0.34⁑
BIM-Rc			–	0.40⁑	–0.24⁑	–0.31⁑	–0.15*	–0.26⁑
BIM-Kd				–	0.08	0.05	0.08	0.21⁑
MD-Juse					–	0.31⁑	0.51⁑	0.38⁑
MD-Disf						–	0.32⁑	0.57⁑
MD-Difg							–	0.44⁑
MD-Dehh								–
M	3.77	4.36	3.33	2.84	1.87	2.14	1.92	2.20
SD	0.73	0.55	0.66	0.78	0.67	1.06	0.64	0.84

Note. * $p < 0.05$, ⁑ $p < 0.01$, BIM-N Bystander Intervention Model – Notice the event, BIM-E – Interpret the event as an emergency and help, BIM-R – Accept responsibility and help, BIM-K – Know how to help, MD-Jus Moral disengagement – Justification, MD-Dis – Disregarding or misrepresenting injurious consequences, MD-Dif – Diffusion of responsibility, MD-Deh – Dehumanization

The intercorrelation matrix shows that the correlations between the factors of MD are slightly stronger than the correlations between the factors of BIM. The correlations

between BIM and MD are either negligible or low to moderate, the strongest being negative associations between interpreting the event as an emergency (seriousness) and all MD factors. The mean scores for the BIM factors indicate that students generally notice cyberbullying events, take them seriously, and feel somewhat responsible to take some form of action. However, it is evident that the mean score for knowledge is the lowest. The average scores for the MD factors are relatively low, with the highest SD for disregarding or misrepresenting injurious consequences.

Next, we were interested in how students' gender, age, free time spent online, and moral disengagement mechanisms predicted different factors in BIM. We used multiple linear regression analysis (Table 2). In the proposed models, gender, age, and free time spent online were included in the first step, and MD factors in the second step.

Table 2

Regression coefficients for steps of the Bystander Intervention Model

		Model 1 Notice the event			*Model 2 Interpret the event as an emergency and help*			*Model 3 Accept responsibility and help*			*Model 4 Know how to help*		
		B	*β*	*p*	*B*	*β*	*p*	*B*	*β*	*p*	*B*	*β*	*p*
Step 1	Gender	0.04	0.03	0.703	–0.32	–0.27	0.000⁂	–0.16	–0.12	0.100	0.21	0.13	0.075
	Age	0.03	0.14	0.043*	–0.02	–0.09	0.202	0.04	0.17	0.015*	0.03	0.13	0.064
	Free time online	0.14	0.21	0.003‡	0.09	0.17	0.012*	–0.00	–0.00	0.954	–0.07	–0.11	0.137
		R = 0.25 R^2 = 0.06 ΔR = 0.06*			R = 0.32 R^2 = 0.10 ΔR = 0.10⁂			R = 0.22 R^2 = 0.05 ΔR = 0.05*			R = 0.20 R^2 = 0.04 ΔR = 0.04*		
Step 2	Gender	0.16	0.10	0.168	–0.20	–0.17	0.012*	–0.04	–0.03	0.679	0.12	0.07	0.335
	Age	0.03	0.12	0.085	–0.02	–0.12	0.052	0.03	0.15	0.026*	0.04	0.15	0.032‡
	Free time online	0.14	0.21	0.004‡	0.10	0.19	0.003‡	0.01	0.02	0.762	–0.07	–0.09	0.192
	MD-Jus	–0.03	–0.03	0.714	–0.14	–0.18	0.021*	–0.17	–0.17	0.034*	0.01	0.01	0.895
	MD-Dis	0.02	0.03	0.747	–0.09	–0.18	0.020*	–0.13	–0.22	0.010*	–0.07	–0.10	0.260
	MD-Dif	0.08	0.07	0.378	–0.10	–0.11	0.152	0.05	0.05	0.558	–0.01	–0.01	0.930
	MD-Deh	–0.24	–0.28	0.003‡	–0.06	–0.09	0.281	–0.05	–0.06	0.505	0.25	0.27	0.005*
		R = 0.35 R^2 = 0.12 ΔR = 0.06‡			R = 0.52 R^2 = 0.27 ΔR = 0.17⁂			R = 0.39 R^2 = 0.15 ΔR = 0.10⁂			R = 0.30 R^2 = 0.09 ΔR = 0.05*		

Note. N = 195 bystanders; * $p < 0.05$, ‡ $p < 0.01$, β – standardized β coefficient; R – multiple correlation coefficient, R^2 – determinant coefficient; ΔR^2 – multiple correlation coefficient change

With the variables in the regression models, we managed to explain the most variance in *Interpret the event as an emergency and help* (27%) and in *Accept responsibility and help* (15%), but less in *Notice the event* (12%), and the least in *Know how to help* (9%).

Among the sociodemographic factors, the following proved to be important predictors of BIM steps: free time spent online (by noticing the event and by interpreting the event as serious) and age (by accepting responsibility and by knowing how to help).

For MD, the following predictors were important: dehumanization (by noticing the event and by knowing how to help) and justification and disregarding of consequences (by interpreting the event as an emergency and by accepting responsibility and helping).

4 Discussion

The aim of our study was to provide some new insights into the issue of cyberbullying among higher education students. We examined how different sociodemographic variables and mechanisms of MD predict the cyber-bystanders' perceptions of each step of the BIM.

Authors have highlighted the importance of (cyber) bystanders in (cyber) bullying dynamics (Saarento et al., 2015; Moxey and Bussey, 2020), as they are the most powerful group with the potential to exacerbate or ameliorate a (cyber) bullying event, similar to traditional peer bullying (Pečjak and Pirc, 2014, p. 163). Therefore, the following analyses were conducted on our subsample of higher education cyber-bystanders. Using a series of multiple linear regressions (MLR), we created predictive models for the perceptions of the different steps of the BIM.

In the first step of the BIM – "Notice the event", we were able to explain 12% of the differences between students with the variables included. The first step of the MLR showed that older students and those who spent more free time online were significantly more likely to notice a cyberbullying event. Only free time spent online remained a significant predictor of noticing the cyberbullying event in the second step of MLR, which is not surprising given that the likelihood of witnessing such an event increases with time spent in cyberspace (Adebayo et al., 2019; Balakrishnan, 2015; Costello et al., 2017). Another important predictor was the MD mechanism of dehumanization. Namely, students who believed that turning off the social network was not a solution to stopping cyberbullying events, or those who were less likely to believe that some students may not be affected by cyberbullying because they are not as emotional, were more likely to acknowledge that cyberbullying exists among students.

In the second step of the BIM – "Interpret the event as an emergency and help", we were able to explain 27% of the variance for this factor. Female students and students who spent more free time online were more likely to interpret a cyberbullying event as an emergency and provide help. Both predictors remained significant also in the second step of the MLR. In terms of gender, our results are consistent with other studies (DeSmet et al., 2016; Ma et al., 2019; Macaulay et al., 2019; Pečjak and Pirc, 2014, p. 164) – females are more prosocially oriented and convinced that they need to help peers in trouble. The results also support previous findings by Costello et al. (2017),

who found that higher presence in cyberspace predicted cyber-bystanders' intervention in cyberbullying incidents. Furthermore, students with less pronounced moral justification and disregard for or misrepresentation of injurious consequences tended to perceive a cyberbullying situation as serious and (intended to) help. Students who believed that cyberbullying does no real harm and those who were less likely to believe that cyberbullying is a form of retaliation were more likely to believe that cyberbullying is hurtful and could affect cyber-victims, even if a cyberbullying event is meant as a joke. They were also more likely to think that they would do something to stop cyberbullying if they noticed it. It seems that (especially female) students, who are more sensitive to the feelings of cyber-victims, see a cyberbullying event as something worth addressing and taking action against. In terms of prevention, it would therefore be beneficial to train emotion regulation in younger students as well, as it shows an improvement in their social ability and sensitivity (Romih and Košir, 2018, p. 36).

In the third step of the BIM, we predicted "acceptance of responsibility and help" in the case of cyberbullying. The included variables explained 15 % of the variance among students. It turned out that older students perceived greater responsibility and were more willing to help. Age was a significant predictor in both the first and second step of the model. The result was expected, since students were already at a high level of moral development, with simultaneously developed critical thinking skills (Mason and Gibbs, 1993), which could cause students to feel a duty to help. Regarding the MD mechanism, we found that less moral justification and disregard for consequences predicted a greater likelihood that a student would feel personally responsible when witnessing cyberbullying.

The last step of the BIM was "Know how to help". With the variables included in the model, we were able to explain 9 % of the differences between students in this factor. Two significant predictors were found – age and dehumanization. The results showed that older students have more knowledge about what to say or do to help someone who has been a victim of cyberbullying. This has to do with more experience, as they have probably already tried different strategies and found out which ones are more effective. However, the fact that dehumanization was a positive predictor was somewhat puzzling. One possible explanation would be that students believe that they know what to do, but their knowledge of strategies is based on their misconceptions about cyberbullying (e.g., that cyberbullying can be avoided by turning off the Internet, or that if the victim of cyberbullying is supposedly indifferent to what is happening to them, this means that they do not need help). Therefore, we assume that students are not sufficiently equipped with the appropriate procedures for taking action when they witness cyberbullying situations, which is also in line with the lowest mean score for "Know how to help" (Table 1). This is consistent with the results of a qualitative study by Crosslin and Golman (2014), who found that students do not know where to report cyberbullying.

Although we did not find any prevention programmes specific to college students on strategies for dealing with cyberbullying situations, we believe that some programmes could benefit higher education students as well. One way is to report cyberbullying in the online application where it occurs. Another is to offer support to the victim by talking to them in a private chat and suggesting they seek help, or by posting positive comments in response to negative ones. It is also important that students realize how

harmful it can be if they themselves engage in online bullying with offensive comments (Safe.si, 2021).

Practical implications

Our findings suggest that cyber-bystanders are indeed an important group that should be educated about strategies they can use when they witness a cyberbullying event. Moreover, uninvolved students and those who were identified as cyber-bystanders should be sensitized about the seriousness of cyberbullying events (even those meant as jokes) and of their important role in preventing cyberbullying events by taking responsibility and responding. Knauf et al. (2018) and Lo Cricchio et al. (2021) emphasize the importance of addressing the beliefs that promote the mechanisms of moral disengagement (e.g., justifying or trivializing cyberbullying incidents) and promoting moral responsibility in an online interaction. Therefore, it seems necessary to identify and address students' misconceptions about cyberbullying, as these could also be a barrier to students taking a more active role in preventing cyberbullying. Sabella et al. (2013) mention the misconception that cyberbullying can be stopped by disconnecting from the Internet or deleting offending messages, which is not enough and can lead to the destruction of evidence. Instead, they suggest providing students with information and skills they can use when confronted with cyberbullying. This could be done by organizing short, mandatory workshops that could include activities to increase awareness of cyberbullying incidents and a sense of responsibility for non-aggressive online communication (Crosslin and Golman, 2014; Knauf et al., 2018). Activities should also focus on fostering students' self-efficacy beliefs to help in cyberbullying situations (Ferreira et al., 2020), promoting empathy (Torgal et al., 2023) and highlighting the consequences that cyberbullying has on victims (Dominguez-Hernandez et al., 2018). Educational institutions can take preventive action against cyberbullying by teaching students the skills they need to resist bullying and by encouraging the development of emotional competencies that will help them avoid becoming victims or bullies (Jevtić and Petrović, 2016, p. 116). This is especially important because there is a positive interdependence between online and traditional bullying (Pšunder and Kozmus, 2020, p. 92). It would also be beneficial for college professors to set up an anonymous hotline for students to report cyberbullying incidents. In short, our findings call on stakeholders and researchers to turn their focus also to groups of cyber-bystanders and uninvolved students at post-secondary educational institutions.

Limitations and future directions

There are some limitations to our study. First, the prevalence rates could be influenced by the possibility that students who spend more of their free time on online interactions chose to participate in our online survey, thereby increasing our sample bias. There is also a need for caution when interpreting the results regarding moral justification since the internal consistency coefficient for this factor was very poor. In addition, we only captured students' perceptions at a declarative level. Namely, we sought to capture their beliefs about cyberbullying events to determine their MD mechanisms and their perceptions about the steps of BIM. However, the behavioural element was missing. Therefore, for future research, we propose that students describe their actual behaviour when they witness a cyberbullying incident. Another issue is that we treated

cyber-bystanders as a homogeneous group rather than differentiating them in terms of their aggressive/constructive behaviours (e.g., Bussey et al., 2020; Luo and Bussey, 2019) or their guilty/non-guilty feelings (Oberman, 2011). Future research, particularly studies examining MD mechanisms in cyber-bystanders, should take into account that cyber-bystanders have several other characteristics (aside from MD mechanisms) that may differentially predict their behaviour in cyber-bullying incidents (e.g., aggressiveness, empathy, prior victimization, etc.). Finally, it is important to emphasize that researchers need to reach a consensus on a time frame for reporting cyberbullying events that would allow for better comparability of results across different studies.

This study was supported by the Slovenian Research Agency (research core funding No. P5-0110).

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Moralna (ne)zavzetost pri študentih opazovalcih spletnega nasilja

Spletno nasilje je definirano kot agresivno dejanje, ki ga posameznik ali skupina posameznikov izvaja večkrat prek elektronskega medija (Kowalski idr., 2014). Pri tem se je večina dosedanjih študij (Cappadocia idr., 2013; DeSmet idr., 2016) osredotočala predvsem na otroke in mladostnike, ne pa na študentsko populacijo. Razlog je lahko v tem, da dojemamo študente kot odrasle, ki so sposobni poskrbeti sami zase in na katere ima okolje manjši vpliv, oz. menimo, da se pri njih "ne da nič več narediti" (Myers in Cowie, 2019). Vendar pa, kot kažejo sicer redke raziskave o posledicah spletnega nasilja na psihosocialno počutje študentov (Erişti in Akbulut, 2019; Peled, 2019), obstaja potreba po sistematični obravnavi teh vprašanj ter prepoznavanju rizičnih in varovalnih dejavnikov tudi pri tej starostni skupini. Večina študij med študenti se je do sedaj osredotočala na vlogi izvajalcev in tistih, ki nasilje doživljajo, tj. žrtve in storilce (Dou idr., 2020; Tanrikulu in Erdur-Baker, 2021), in ne na opazovalce spletnega nasilja, kot je to v primeru naše študije.

Eden od procesov, ki so pogosto predmet preučevanja pri (spletnem) medvrstniškem nasilju, je mehanizem moralne nezavzetosti (MNZ). Moralna nezavzetost vključuje vrsto socialno-kognitivnih mehanizmov, ki posameznikom omogočajo, da "izklopijo" samosankcioniranje v obliki občutkov sramu, krivde ali negativnega samovrednotenja. Načeloma se pojavijo, ko kršijo lastna moralna merila (Bandura, 1999). Po Banduri (2002) so najpogostejši mehanizmi MNZ: moralno opravičevanje, razpršitev ali prenos odgovornosti na druge, minimiziranje škodljivih učinkov storilcev ter obtoževanje in razčlovečenje žrtev. Pri tem raziskovalci poudarjajo, da je razvijanje moralne zavzetosti pri opazovalcih spletnega nasilja lahko pomemben zaščitni dejavnik, ki zmanjšuje pojavnost in posledice tega nasilja (DeSmet idr., 2016; Moxey in Bussey, 2020). Vendar pa dosedanje ugotovitve o povezavi med moralno nezavzetostjo in opazovalci spletnega nasilja niso konsistentne: v nekaterih niso odkrili povezav med moralno nezavzetostjo in branjenjem žrtev (Allison in Bussey, 2016; DeSmet idr., 2016), drugi pa so ugotovili, da mehanizmi moralne nezavzetosti zmanjšujejo pripravljenost za posredovanje (Moxey in Bussey, 2020).

Izhajajoč iz socialno-kognitivne teorije, ki poudarja interaktivno povezanost okoljskih, osebnih in vedenjskih dejavnikov, lahko pri spletnem nasilju moralno nezavzetost obravnavamo kot osebni dejavnik, kot pomemben okoljski dejavnik pa Machackova (2020) navaja intervencijski model opazovalcev.

Intervencijski model (Latané in Darley, 1970) opisuje pet korakov, ki jih mora opazovalec medvrstniškega nasilja narediti, preden ukrepa:

- *opaziti dogodek,*
- *interpretirati dogodek kot resen in ogrožajoč,*
- *se čutiti odgovornega za posredovanje,*
- *vedeti, kako posredovati oz. pomagati, in*
- *odločiti se za posredovanje.*

Raziskave o vedenju opazovalcev glede na intervencijski model so pri spletnem nasilju pokazale nasprotujoče si rezultate glede na spol. Nekatere študije niso odkrile razlik med spoloma pri napovedovanju pomoči (Barlińska idr., 2013; Machackova idr., 2013), druge pa so ugotovile večjo verjetnost, da bodo ženske opazovalke pogosteje branile spletne žrtve (DeSmet idr., 2016; Ma idr., 2019). Kar zadeva starost opazovalcev, so nekatere študije pokazale, da je večja verjetnost, da bodo prej kot starejši posredovali mlajši mladostniki (Ma idr., 2019; Van Cleemput idr., 2014); nismo pa našli študij, ki bi raziskovale odzive na spletno nasilje pri študentih. Pri študentski populaciji pa obstajajo raziskave, ki kažejo, da več časa, preživetega na spletu, napoveduje večjo vpletenost v spletno nasilje nasploh (Adebayo idr., 2019; Balakrishnan, 2015), pri študentih opazovalcih pa večjo verjetnost za posredovanje (Costello idr., 2017).

Zaradi pomanjkanja študij o MNZ pri študentih opazovalcih in njihovem odzivanju na spletno nasilje smo skušali v naši raziskavi odgovoriti na dve raziskovalni vprašanji:

- *Kako demografske spremenljivke (spol, starost in čas, preživet na spletu) in moralna nezavzetost napovedujejo korake pri intervencijskem modelu?*
- *Kateri so ključni mehanizmi moralne nezavzetosti, ki bi opazovalcu spletnega nasilja lahko preprečili, da opravi korake v skladu z intervencijskim modelom?*

V celotnem vzorcu 764 študentov je bilo 205 študentov opazovalcev spletnega nasilja, od tega 71,7% žensk, 27,8% moških in 0,5% neopredeljenih. Njihova povprečna starost je bila 21,25 leta (SD = 2,96).

Uporabili smo tri pripomočke. Prvi je bil spletni vprašalnik, ki smo ga oblikovali za potrebe študije. Z njim smo določili vloge pri spletnem nasilju: izvajalec nasilja, študent, ki nasilje doživlja, in opazovalec nasilja. Študenti so odgovarjali s pomočjo 6-stopenjske lestvice na vprašanje, kako pogosto so bili v zadnjih 6 mesecih v kateri od vlog (1 – nikoli; 6 – več kot enkrat na teden). Višji skupni seštevek je kazal bolj izrazito vlogo. Vse tri lestvice so imele ustrezne zanesljivosti (alfa za lestvico izvajalca je bil 0,81, za študenta, ki doživlja nasilje, 0,80 in za opazovalca 0,90). Študenti so odgovorili še na vprašanje, koliko prostega časa na dan preživijo na spletu (1 – nič, 7 – več kot 6 ur).

Drugi je bil Vprašalnik opazovalcev v intervencijskem modelu pri spletnem nasilju (Kos, 2021) s 16 postavkami, na katere so študenti odgovarjali s pomočjo 5-stopenjske lestvice (1 – sploh se ne strinjam, 5 – popolnoma se strinjam) in so vsebovale štiri faktorje: zaznava dogodka (α = 0,74), razlaga dogodka kot nujnega in pomoč (α = 0,86), odgovornost in pomoč (α = 0,82) in vedeti, kako pomagati (α = 0,79).

Tretji je bil Vprašalnik moralne nezavzetosti pri spletnem nasilju (Kos, 2021) z 12 postavkami, ki so merile stopnjo moralnega presojanja študentov s štirimi faktorji: moralno opravičevanje (α = 0,49), razpršitev odgovornosti (0,59), razčlovečenje (0,76) in minimaliziranje oz. zmanjševanje škodljivih posledic (0,85).

Po podanem informiranem soglasju so študenti odgovarjali na spletne vprašalnike. Podatke smo zbirali od marca do aprila 2021. Komfirmatorne faktorske analize so bile izvedene s paketom R lavaan v0.-8; Pearsonove korelacije med spremenljivkami ter analize multiple linearne regresije pa v IBM SPSS Statistics za Windows, različici 25.0.

S pomočjo multiple linearne regresijske analize smo odgovorili na prvo raziskovalno vprašanje – kako sociodemografske spremenljivke (spol in starost študentov ter prosti čas, preživet na spletu) in posamezni faktorji moralne nezavzetosti napovedujejo različno odzivanje študentov v intervencijskem modelu. S spremenljivkami nam je uspelo pri intervencijskem modelu opazovalcev pojasniti največ variance pri razlagi dogodka kot resnega in pomoči potrebnega (27%), najmanj pa pri tem, kako pomagati (9%).

V prvem koraku intervencijskega modela opazovalcev – pri "zaznavi spletnega nasilja" – smo z vsemi vključenimi spremenljivkami pojasnili 12% variance, pri čemer se je kot pomemben napovednik pokazal čas, preživet na spletu. To ni presenetljivo glede na to, da se verjetnost, da je študent priča takšnemu dogodku, povečuje s časom, ki ga preživi na spletu (Adebayo idr., 2019; Balakrishnan, 2015; Costello idr., 2017). Drugi pomemben napovednik je bil faktor moralne nezavzetosti – razčlovečenje. Študenti, ki so manj verjeli, da izklop iz družbenega omrežja zaustavi nasilje ali da nekateri učenci manj trpijo zaradi spletnega nasilja, ker niso tako čustveni, so bili bolj senzibilni in pogosteje zaznavali to nasilje.

V drugem koraku, tj. "razlaga dogodka kot resnega in pomoč", smo s spremenljivkami uspeli pojasniti 27% variance. Pokazalo se je, da so si študentke in tisti študenti, ki so več prostega časa preživeli na spletu, pogosteje razlagali dogodke spletnega nasilja kot resne in bili pripravljeni nuditi pomoč. Ugotovljeno prosocialno usmerjenost deklet s prepričanjem, da morajo pomagati vrstnikom v težavah, potrjujejo tudi druge študije (DeSmet idr., 2016; Ma idr., 2019; Macaulay idr., 2019). Naši rezultati podpirajo tudi ugotovitve Costella idr. (2017), da večja prisotnost študentov na spletu povečuje verjetnost, da bodo posredovali v primeru, če bodo opazili spletno nasilje. Hkrati pa študenti z manj izrazitim moralnim opravičevanjem in manj minimaliziranja spletnega nasilja dojemajo to nasilje kot bolj resno in so bolj prepričani, da vrstniki, ki ga doživljajo, potrebujejo pomoč.

V tretjem koraku intervencijskega modela "sprejemanje odgovornosti in pomoč" so vključene spremenljivke pojasnile 15% variance med študenti opazovalci. Izkazalo se je, da so starejši študenti zaznavali pri sebi več odgovornosti in bili bolj pripravljeni pomagati. Rezultat je bil pričakovan, saj so starejši študenti že na visoki stopnji moralnega razvoja, s sočasno razvitimi sposobnostmi kritičnega mišljenja (Mason in Gibbs, 1993), kar pri teh študentih prej privede do občutka dolžnosti, da pomagajo. V zvezi z moralno nezavzetostjo smo ugotovili, da manj moralnega opravičevanja in neupoštevanja posledic napoveduje večjo verjetnost, da se bo študent počutil osebno odgovornega za ukrepanje, ko bo priča spletnemu nasilju.

Zadnji korak intervencijskega modela je bil "vedeti, kako pomagati", pri čemer nam je s spremenljivkami uspelo pojasniti le 9% razlik med študenti. Ugotovljena sta

bila dva pomembna napovednika – starost in dehumanizacija. Rezultati so pokazali, da imajo starejši študenti več znanja o tem, kaj reči ali narediti, da bi pomagali nekomu, ki je doživel spletno nasilje. To je povezano z več izkušnjami, saj so verjetno že preizkusili različne strategije in ugotovili, katere so bolj in katere manj učinkovite. Nepričakovan rezultat pa je bil, da je dehumanizacija pozitiven napovednik vedenja o tem, kako pomagati. Ena od možnih razlag bi bila, da študenti verjamejo, da vedo, kaj storiti, vendar njihovo znanje o strategijah pomoči temelji na napačnih predstavah o spletnem nasilju.

V praktičnih implikacijah ugotavljamo, da imajo študenti opazovalci pomembno vlogo pri poseganju v situacije spletnega nasilja, kar pa je povezano z njihovo moralno zavzetostjo. Zato je pomembno s študenti obravnavati napačna prepričanja (npr. opravičevanje ali banaliziranje incidentov spletnega nasilja; prepričanja, da je možno to nasilje zaustaviti z izklopom interneta) in jim pomagati pri tem, kako se pridobi informacije in spretnosti, ki jih lahko uporabijo, ko se soočijo s spletnim nasiljem. Npr. s kratkimi delavnicami za povečanje ozaveščenosti o spletnem nasilju in njegovih posledicah, o odgovornosti za neagresivno spletno komunikacijo in s strategijami pomoči, z vzpostavitvijo anonimne telefonske linije za prijavo primerov tega nasilja za študente.

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Mechanisms for the Formation of Empathic Culture of Students

Prejeto 18. 4. 2023 / Sprejeto 30. 6. 2023

Znanstveni članek

UDK 159.942-057.875

KLJUČNE BESEDE: empatija, empatična kultura, študent, učitelj, pedagoška univerza, medicinska univerza

POVZETEK – Avtorici v svoji raziskavi poročata o posledicah nezadostne metodološke razvitosti mehanizmov in metod za oblikovanje empatije med študenti pedagoških in medicinskih univerz, ki je pomembna poklicna kompetenca bodočih učiteljev in zdravnikov. Empatična kultura učiteljev in zdravnikov je sestavni del osebne kulture, sestavni del poklicne spretnosti, ki zahteva namensko oblikovanje in razvoj. Namen študije je teoretično utemeljiti in eksperimentalno preizkusiti mehanizme oblikovanja empatične kulture pri študentih pedagoških in medicinskih univerz. Glavna raziskovalna metoda temelji na izbrani diagnostiki. Pri poklicih zdravnik in učitelj smo dokazali, da je empatija pomembna poklicna kvaliteta. Večina študentov pedagoških in medicinskih univerz je pokazala povprečno raven empatične kulture. Pri učiteljih so bolj razviti čustveni dejavniki in dejavnostni kanali empatije, pri zdravstvenih delavcih pa kognitivni dejavniki. Rezultati študije se lahko uporabljajo pri strokovnem usposabljanju študentov pedagoških in medicinskih univerz.

Received 18. 4. 2023 / Accepted 30. 6. 2023

Scientific paper

UDC 159.942-057.875

KEYWORDS: empathy, empathic culture, student, teacher, pedagogical university, medical university

ABSTRACT – The relevance of this study is caused by the insufficient methodological development of the mechanisms and methods for empathy formation in students of pedagogical and medical universities, which is an important professional competence of future teachers and doctors. The empathic culture of teachers and doctors is an integral part of personal culture, a component of professional skills that requires targeted training and development. The aim of the study is to theoretically justify and experimentally test the mechanisms of empathic culture formation in students of pedagogical and medical universities. The main research method is based on the selected diagnostics. We have proved that empathy is an important professional trait in the profession of doctors and teachers. Most students of pedagogical and medical universities showed an average level of empathic culture. The emotional and active channels of empathy are more prominent in teachers, and the cognitive channels are more prominent in physicians. The results of the study can be used in the professional training of students of pedagogical and medical universities.

1 Introduction

In the process of professional training of future teachers and doctors, it is especially important to develop an empathic culture as a basic professional quality for a modern specialist (Lepičnik-Vodopivec, 2003). Communication plays a crucial role in pedagogical practice as it is a fundamental component of successful pedagogical practice that enables a more engaging, collaborative, and fulfilling learning experience for everyone involved (Klopčič et al., 2016). In addition, empathic communication involves both accepting and allowing different perspectives and emotions in others and sharing them with them to provide encouragement and support. Teachers, doctors and other healthcare workers do activities in the person-to-person system, where they try to liken themselves to another person to "understand" another person's experiences and feelings

and assume the position of a communication partner (Šimec et al., 2022). The problem is that much emphasis is placed on the acquisition of clinical skills and abilities in the education of medical students, while it is necessary to develop empathy in medical students. A doctor's empathy is expressed in the ability to feel empathy and understand the patient's emotional state, to sympathise with him/her. A person's empathy results from the double contradiction between their own experiences and the perceived experiences of another person.

The Professional Standard of a Teacher states that a teacher of primary general education must be able to communicate with children, recognise their dignity, understand and accept them; be able to analyse the actual situation in the classroom; be able to protect the dignity and interests of students; be ready to communicate as the most important adult in the social situation of the development of a primary school child in conditions where children's trust in the teacher grows (Professional Standard of a Teacher, 2013).

Pedagogical activity is associated with high emotional load of the teacher. The most important moral quality of a teacher, which contributes to the formation of his/her professional communicative competence, is empathy in relationships with people (Hmelak and Rudaš, 2020). Empathy contributes to the balance of interpersonal relations, moral growth of the person and effective mutual understanding in communication with children. In conditions of lack of "warmth" in interpersonal relations, strong negative changes in socio-economic structure, people face the problem of loneliness and indifference. In this context, the problem of empathy as the ability to sympathise and empathise becomes relevant in the context of teacher training (Dolgova and Melnik, 2014).

The empathic culture of a teacher is an integrative quality, manifested in the ability to emotionally respond to the feelings of students, to build relationships with them and taking into account their inner attitudes. Empathy is an indicator of professional success of a teacher and a doctor. In this context, it seems relevant to study the mechanisms of empathy formation as a professionally important quality. The problem of empathy has been included as a scientific problem in the circle of general problems of personality formation. Without its understanding, it is difficult to carry out a productive analysis of the mechanisms and basic characteristics of a person's mental and moral development. Several foreign authors such as Jung (1996), Lipps (1907), Rogers (1994), and Kohut (2000) have studied empathy in its various forms. Jung (1996) saw the essence of empathy in the projection of subjective content: "Since the essence of empathy consists in the projection of subjective contents, the unconscious act preceding it must have the opposite character, namely, the redemption of the object's effectiveness. Self-activity fills this object to a certain extent and thus adapts to the perception of subjective empathic content". Lipps (1907) presented the content of empathy as the self-objectification in an object different from Me, whether the objectified name of the feeling deserves it or not. According to Rogers (1994), the teacher must possess the following abilities: the desire for maximum flexibility; the ability to empathise, sensitivity to the needs of school children; the ability to give a personal coloring to the process of education and training; the attitude of creating positive reinforcements for children's self-perception; the possession of a style of simple, informal, warm communication with children; emotional balance, self-confidence, cheerfulness.

Kohut (2000) considered empathy a universal need for development. The infant's experience of empathic "mirroring" of the caregiver is a necessary component of the

development of a connected self, and conversely, traumatic failures to provide empathic "mirroring" play a critical causal role in the development of defects and pathology of the self. Zhou et al. (2021) conducted a systematic review of approaches to teaching and assessing empathy in medicine and concluded that empathy is one of the core competencies medical workers can use to provide successful patient- and relationship-centred care. A high level of empathy is essential for the development of professionalism in students in training for medical professions. Other researchers (Krishnasamy et al., 2019) have conducted research on how medical student, patient and teacher perceptions affect empathy, how education influences empathy and how compassion is expressed in medical students. The results of the authors' research include important decisions for health care educators and health care curriculum developers. Yu et al. (2022) studied empathy in students, teachers, doctors and physicians and identified 3 factors for empathy stability. High stability factors form the basis for individual empathy behaviour. Low stability factors are those that are highly situation dependent. Medium stability factors are those that are persistent in the environment and can influence empathy levels in the long term. Researchers Sobczak and Popowicz (2019) compared the levels and scales of empathy of individuals studying according to different educational strategies: students of medical specialties, nursing, obstetrics, physical therapy, psychology, pedagogy and sociology. Scientists have noticed a serious decrease in the level of empathy among medical students. Empathy declines in students after the third year of study, regardless of the type of university.

Other researchers – Kanchan et al. (2018) – believe that the medical profession has been challenged due to declining quality of healthcare services. This decline is attributed to the weakening of human values and the lack of empathy and communication skills among physicians. Researcher Geoffrey (2017) found that the medical profession has adopted a cognitive model of empathy or detached concern in its professionalism and practice. Currently, there is a gap in physician empathy, as evidenced by poor patient care in the United Kingdom. Medical students may also develop empathy deficits during their studies. Based on a study of the level of empathic communication among students, a group of researchers (Lermen et al., 2022) concluded that empathy is an important component of personal characteristics, as is the ability to manage emotions, which affect the quality of communication between them and patients.

Nemov (1999) suggests several classifications of the empathy types:

- emotional empathy;
- cognitive empathy;
- predicative empathy;
- aesthetic empathy;
- egocentric empathy; 6) humanistic empathy.

Zakharova et al. (2019) study empathy as the basis of doctor-patient communication and consider the development of empathic behaviour in future teachers and doctors. The analysis of views of Russian and foreign scientists reflecting the essence of the concept of "medical empathy" is given. Empathy is the core of interpersonal relations based on effective professional communication between medical professionals and patients. Shkitina et al. (2014) reveal the features of pedagogical empathy. They believe that empathy in a teacher's professional activity is not so much a tool as the main

strategy of the teacher's activity. For a teacher, empathy is a more complex quality that implies the organisation of a certain educational influence. The result will not always be a productive communication between the teacher and the student, since the educational process can go its own way and get out of control due to serious influences caused by various random factors. The personal qualities of a teacher are inseparable from professional competencies. Podlasy (2004) refers to scientific enthusiasm, love for one's professional work, erudition, mastery of the subject and teaching methods, mastery of the technologies of pedagogical work, organisational skills and abilities, pedagogical tact, mastery of communication technologies, oratory skills, and spiritual sensitivity as these professional competencies. Studying the professional component of the teacher's psychological and pedagogical competence, Sinyagina and Derkach (1998) found that the teacher's empathy, together with reflection, flexibility, sociability, and the ability to cooperate, stimulates a state of emotional well-being, intellectual activity, creative search, and promotes mutual understanding in relations with the student.

Thus, the analysis of psychological and pedagogical literature shows the interest of researchers in empathy and allows us to define empathy as a personality trait expressed in sympathy, compassion, engagement, based on genetically determined abilities of projection and emotional response to another person.

2 Materials and methods

The *aim* of the study is to theoretically justify and experimentally test the levels of formation of an empathic culture in students of pedagogical and medical universities.

Research objectives:

- To determine the most effective methods for the formation of empathy among students majoring in education and medicine;
- Experimentally test the level of empathy formation among students of pedagogical and medical universities;
- Development of a special course on the formation of empathy among students at a pedagogical university.

Various methods were used to test the hypothesis, complementing each other: observation, summative and formative pedagogical assessment, questioning, testing, analysis of the results of experimental work.

Within the framework of the studies, the authors used quantitative research methods, an anonymous survey of 65 first-year students majoring in General Medicine of the Faculty of General Medicine of the Kirov State Medical University; 60 first-year students of the training programme "Primary education and foreign (English) language" of the Institute of Psychology and Education of Kazan Federal University.

We chose the following diagnostic method for the study:

- The method of diagnosis of communicative control by Schneider (Fetiskin et al., 2002);
- Assessment programme of non-verbal communication by Kuznetsova (Fetiskin et al., 2002);

- Methodology "Balanced Emotional Empathy Scale" by Mehrabian and Epstein (Fetiskin et al., 2002).

Schneider's communicative control diagnostic method aims to determine the level of communicative control. Participants are required to read 10 statements reflecting reactions to specific communication situations and rate each statement as true (t) or untrue (u) in relation to themselves by placing the appropriate letter next to each item. 1 point will be awarded for the answering "t" to questions No. 1, 5 and 7 and for answering "u" to all other questions. The total score is calculated as follows: 0–3 points correspond to low communicative control; 4–6 points correspond to average communicative control; 7–10 points correspond to high communicative control.

In the assessment programme of non-verbal communication of Kuznetsova, test takers must answer 20 questions. There are 4 answer options: A – always; B – often; C – rarely; D – never. Each question has four possible answers, and each possibility is assigned a certain number of points from one to four (A – 4 points; B – 3 points; C – 2 points; D – 1 point). This technique makes it possible to diagnose three parameters of non-verbal communication: 1) General assessment of a person's non-verbal repertoire in terms of its diversity, harmony and differentiation (questions No. 1, 5, 8, 12, 15 and 17). Quantitative evaluation of this parameter can range from +9 to –9 points. 2) Sensibility, sensitivity of a person to the non-verbal behaviour of another (expert observer), the ability to identify appropriately (questions No. 2, 4, 7, 11, 14, 18 and 20). The quantitative assessment varies from 28 to 7 points. 3) The ability to manage one's non-verbal repertoire adequately to the purpose and situation of the communication (questions No. 3, 6, 9, 10, 13, 16 and 19). The quantitative assessment varies from 23 to 2 points. The level of development of each of the described skills is calculated as the sum of points for the answers to the corresponding questions (for questions No. 5, 8, 12, 19, the points obtained are subtracted from the total for each of the three parameters). For each evaluated parameter, the arithmetic mean of three expert evaluations is calculated. Based on the total score for the three analysed parameters, a general indicator of the development level of a person's perceptual and communication skills is determined. This indicator can vary from 0 to 60 points. Then, a qualitative analysis of the structure of the subject's non-verbal communication is performed.

With the "Balanced Emotional Empathy Scale" by Mehrabian and Epstein, the general empathic tendencies of the study participant can be analysed, i.e. parameters such as the level of expressiveness of the ability to respond emotionally to the experience of another and the degree of correspondence/inconsistency of the signs of the experience of the object and the subject of empathy. The objects of empathy are social situations and people with whom the participant can empathise in everyday life. The questionnaire consists of 25 closed-ended judgments. The participant must rate the degree to which he/she agrees or disagrees with each of these judgements. Each response is scored from 1 to 4 points. A person's ability to respond emotionally to other people's experience (empathy) can be divided into the following levels: 82–90 points – a very high level; 63–81 points – high level; 37–62 points – normal level; 36–12 points – low level; 11 points or less is a very low level.

3 Results

In the summative phase of the experiment, the method of communicative control diagnosis (Schneider) was used to determine the level of communicative control and to examine the cognitive component in the experimental and control groups. The diagnosis showed that most of the participants in the experimental group (48.3%) had an average level of communicative control (4–6). Some respondents (16.7%) have a high level of communicative control (7–10), and 35% showed a low level of communicative control (0–3).

Most study participants have an average level of communicative control (46.6%) and have no difficulties in interaction. 18.3% of the subjects have a high level of communicative control and have well-developed communication skills. A low level of communicative control is typical for two study participants (40%).

In the summative phase of the experiment, the diagnosis of Kuznetsova was used to determine the level of expert assessment of non-verbal communication in the experimental and control groups. The results of the diagnosis show that the general assessment of the student teachers' non-verbal repertoire in terms of its variety, harmony and differentiation has a high value in nine respondents (15%), a medium value in 27 people (45%) and a low value in 24 (40%) respondents.

10 study participants (16.7%) in the experimental group have a high sensitivity to the non-verbal behaviour of others and the ability to identify adequately. This group is dominated by the tendency to empathy and compassion. 22 people (36.6%) have low scores; they do not experience negative emotions when watching a movie or reading, because they have low sensitivity. 28 people (46.7%) have an average level of sensitivity. A high ability to control their non-verbal reactions is found in 11 study participants (18.2%). Most participants have the ability to control their facial expressions, gestures and posture. In interaction, such people tend to use and control non-verbal communication tools at the right time. A low ability to control their non-verbal repertoire was found in 20 participants (33%), which manifests itself in the substitution of words with gestures. Most subjects (48.8%) showed an average level of ability to control their non-verbal behaviour.

In the control group, a high level of non-verbal repertoire was found in 4 subjects (6.6%), an average level in 30 subjects (50%), and a low level in 31 subjects (53.4%). The indicators of sensibility, sensitivity of a person to the non-verbal behaviour of others in the control group are as follows: high – 7 people (10.8%), average – 28 people (43%), low – 29 people (46.2%). High ability to control their non-verbal repertoire was found in 8 persons (12.1%). Most of the study participants (29 people – 44.5%) have an average level of control over their facial expressions, gestures and posture. Twenty-eight individuals (43.4%) demonstrated a low ability to control their non-verbal repertoire. They have difficulty correlating gestures with words. Often these individuals substitute words for gestures, so they are unable to explain their thoughts.

In the summative phase of the experiment, the diagnostics of Mehrabian and Epstein was used to determine the level of emotional response in the experimental and control groups. According to the results of the diagnostics, the average optimal level of emotional response prevails in twenty-eight subjects (47.8%), 16.7% of the subjects had

a high level of emotional response. 4 subjects had a very high level (6.7%). 6 subjects (10%) showed a very low level.

Table 1

The results of the methodology "Balanced Emotional Empathy Scale" of the control group (Mehrabian and Epstein)

Level	*Number of subjects*	*Percentage*
Very high (82–90)	5	7.6
High (63–81)	5	7.6
Average (37–62)	22	33.9
Low (12–36)	25	38.7
Very low (11 or less)	8	12.2

Diagnostics showed that the average level of emotional response predominated (33.9%). Students with an average level of empathy tended to judge others by their actions rather than trusting their personal impressions. In the control group, 7.6% of subjects have a very high level of emotional response. Most subjects (38.7%) showed a low level of emotional response (Table 1).

During the formative experiment, during the academic year 2022–2023, in order to form an empathic culture of students majoring in education, the experimental group conducted lectures, practical lessons and trainings on the special course "Empathic culture of a student-future teacher" developed by the authors, which includes the following blocks:

- Block 1. Formation of the emotional component of empathy.
- Block 2. Formation of the cognitive component of empathy.
- Block 3. Formation of the activity component of empathy.

The main goal of the special course is theoretical and methodological support of the process of formation of empathic culture of the teacher. The main tasks are to form empathy as a professional life value, to know ways of expressing empathy in various situations in the pedagogical process, to use empathic listening in dialogue, and to show empathy in non-verbal reactions in speech. The special course "Empathic culture of a student-future teacher" consists of 24 lecture hours and 48 practice hours (72 hours = 2 credits). Active methods of teaching (brainstorming, theatricalisation, trainings) were used for implementation of the special course within the framework of students' study of the course "Children's Literature"; also the programme of teaching practice for students in schools, mentoring in children's theater "Rainbow" of the Kazan Federal University was implemented.

Practical lessons in the form of brainstorming were conducted on the basis of the works of Yershov "The Little Humpbacked Horse", Tolstoy "The Shark", "Jump", "The Lion and The Dog", Odoyevsky "The Snuff-Box Town". A theatrical performance based on the work of Aksakov "The Scarlet Flower" was staged. In the reading and analysis of these literary works, the method of empathic reading was used, which aims to pro-

mote the reader's primary reactions (the level of direct impression), the formation of emotional reactions (the level of emotional experience) and the development of rational comprehension (analysis of the situation). Reading and analysing the works of children's book authors contributed to the understanding of the concept of "empathy", awareness of one's emotions and feelings; the development of skills to recognise the emotional states characters; the formation of empathic skills and empathic understanding.

Theatricalisation of works of children's literature aims at understanding and developing empathy. The task of theatricalisation is to develop the ability to recognise one's own emotional states and those of the other person and to develop empathic skills. Pedagogical training of students in elementary school aims to study the personality of younger school children, to explore the psychology of the child, to grasp the individual characteristics of the school child, to recognise the empathic understanding and feelings of the child by the student. Mentoring in children's theater "Rainbow" of the Kazan Federal University is aimed at development of emotional, cognitive and active components of empathy in students – future elementary school teachers. The students conducted lessons with children of primary school age, studied different ways of interaction and communication with younger school children while working on the performance and showed the activity component of empathy.

Thus, the formative experiment in the experimental group allowed to develop three components of empathy: emotional component, cognitive component and activity component. In the control experiment phase, the goal was set to determine the most effective mechanisms for the formation of empathic culture in students of pedagogical and medical universities. In the experimental and control groups of students the following tests were carried out:

- The diagnostic method of communicative control (Schneider);
- The assessment programme of non-verbal communication (Kuznetsova);
- The methodology "Balanced Emotional Empathy Scale" (Mehrabian, Epstein).

Table 2

Comparative diagnostics of communicative control of the experimental and control groups (Schneider)

Level	*Experimental group (%)*	*Control group (%)*	*Difference*
High (7–10)	20	17.0	3% more
Average (4–6)	55	49.2	5.8% more
Low (0–3)	25	38.8	8.8% less

Diagnostics showed the dynamics in the development of communicative control in the students of the experimental group. High and average levels of development of empathic control dominate. The students of this group showed sensitivity to the needs and problems of others, magnanimity, interest in people, emotional responsiveness, sociability, and the ability to avoid conflicts and find compromise solutions. Most respondents in the control group showed a low level of empathic skills, indicating the need for

their development (intuitive, rational, and emotional channels of empathy, management of their emotions) in order to form communicative professional competencies.

Table 3

Comparative diagnostics of assessment program of non-verbal communication of the experimental (EG) and control groups (CG) (Kuznetsova)

Indicators	*General assessment of the non-verbal repertoire in terms of its diversity, harmony, EG and CG*	*Sensibility, sensitivity of a person to the non-verbal behaviour of others, EG and CG*	*The ability to adapt one's nonverbal repertoire to the purpose and situation of communication, EG and CG*
High	18.4 (EG); 6.1 (CG)	20 (EG); 10.8 (CG)	21.6 (EG); 12.1 (CG)
Average	53.3 (EG); 47.5 (CG)	55 (EG); 46.1 (CG)	53.4 (EG); 46.1 (CG)
Low	28.3 (EG); 46.4 (CG)	25 (EG); 43.1 (CG)	25 (EG); 41.8 (CG)

Diagnostics showed the ability of students of the experimental group to analyse and appropriately interpret the state of the subject, to use empathic listening in dialogue, to show empathy in non-verbal responses in speech, indicating the development of the activity channel of empathy.

Table 4

Comparative diagnostics of the difference in expert assessment of non-verbal communication of the experimental (EG) and control groups (CG) (Kuznetsova)

Indicators	*General assessment of the non-verbal repertoire in terms of its diversity, harmony, EG and CG (%)*	*Sensibility, sensitivity of a person to the non-verbal behaviour of others, EG and CG (%)*	*The ability to adapt one's nonverbal repertoire to the purpose and situation of communication, EG and CG (%)*
High	12.3 more	9.2 more	9.5 more
Average	5.8 more	8.9 more	7.3 more
Low	17.9 less	17.9 less	16.8 less

In the experimental group, students demonstrated the dynamics of changes in empathic abilities during the process of vocational training as future elementary school teachers. For students in this group, the emotional component of empathy dominated, followed by the cognitive and active components.

In the control phase of the experiment, the development of the emotional component of empathy was demonstrated in the students – future teachers. For the students of this group, empathy manifests itself as a professional life value, a positive emotional attitude to the situation in professional pedagogical activity, a positive emotional attitude to people.

Table 5

Comparative diagnostics of the level of emotional response according to the method Balanced Emotional Empathy Scale" of the experimental and control groups (Mehrabian, Epstein)

Level	*Experimental group (%)*	*Control group (%)*	*Difference (%)*
Very high (82–90)	13.4	7.6	5.8 more
High (63–81)	23.3	10.8	12.5 more
Average (37–62)	23.3	30.7	14.3 more
Low (12–36)	15	38.7	23.7 less
Very low (11 or less)	3.3	12.2	8.9 less

The experimental group developed a cognitive component of empathy, which consists of a certain knowledge about empathy, its nature and place in professional activity, understanding of the peculiarities of situations in pedagogical activity and the ability to understand a person and put oneself in his/her position. The diagnostic results demonstrated the development of the activity component of empathy in the students of the experimental group as the ability to analyse and appropriately interpret the state of the subject in the educational process, to use empathic listening in dialogue, and to show empathy in non-verbal reactions in speech and behaviour.

Particularly important is the formation of the emotional component of empathy in the experimental group – the ability to empathise with a school child, understand his/her feelings and emotions and sympatise with him/her. The results of the study showed that all three components of empathy gradually developed in the student teachers, while the cognitive component of empathy predominated in the medical students.

The experimental study showed that an empathic culture is essential for future elementary school teachers and general physicians to be competent in the person-to-person profession. The special course developed and implemented to form components of empathic culture of students of pedagogical and medical universities contributes to the development of empathy as an important professional quality of a teacher and a physician. The special course helps to form the emotional, cognitive and active components of empathy, the formation of empathic culture of students of pedagogical and medical universities. The results of the study can be used for professional activity of elementary school teachers, medical students and general physicians.

4 Discussion

One of the main reasons for the ineffective professional activity of teachers and doctors is the low level of empathy, which leads to a significant decrease in professional success. Foreign and domestic scholars provide evidence of the relationship between

high professional success and high levels of empathy in a number of papers. According to Rogers (1975), a person's ability to help another depends on building warm, sincere empathic relationships. The doctor must feel the patient's inner world as if it were his own, without losing the quality of "if." In medical practice, empathy is considered an integral, stable personal quality that affects the social-perceptual and communicative sphere in the "doctor–patient" system. Scholars consider empathy as a communication skill that can be mastered and, to a lesser extent, as a purely subjective emotional experience or an innate, unchangeable personality trait. Haque (2020) considers empathy to be the most important professional quality that needs to be formed during medical university. Omid et al. (2018) revealed the relationship between empathy and human emotional intelligence: the higher the empathy, the higher the emotional intelligence. Shapiro et al. (2004) investigated the process of teaching empathy to first-year medical students by assessing an elective course in literature and medicine. Chen et al. (2019) analysed data on the mediating role of anxiety, self-efficacy, and sleep quality in the relationship between physician-reported empathy and patient illness. Garnett et al. (2020) conducted an online survey to determine the level of empathy among British medical students. Students' empathy levels were found to decrease in the third year of study, whereas first-year medical students had a higher empathic culture.

Medical empathy is defined as the ability to understand the patient's situation, point of view, and feelings, to show their understanding in a conversation, to act on that understanding, and to provide (therapeutic) help to the patient. According to Friedemann (2013), empathic behaviour does not require witnessing the patient's feelings, which can lead to excessive identification of the doctor with the patient and overstepping professional boundaries. Rogers (1994) points out the processual side of empathy: it is the entry into the inner world of another person, the sensitivity to ever-changing meanings. Pedagogical empathy is an emotional feature of the teacher, which plays a great role in the relationship between the participants in the educational process, in the perception of the other and in establishing mutual understanding between them. Ilyin (2013) confirms that teachers' empathy should manifest itself as a basic professional skill in the form of sympathy. Sympathy leads to activation of relationships of warmth, trust, care, openness and support for the child. Simonova (2013) considers it appropriate to abandon the technocratic model of training future doctors. The integration of the humanitarian component into the clinical disciplines will solve the problem of training a competitive specialist with a stable value system and the necessary general cultural and professional competencies that will enable them to perform their professional duties with high quality and responsibility.

Empathy contributes to the balance of interpersonal relations; it makes a person socially adjusted. Empathy developed in a person is a key factor of success in activities that require understanding one's own "I", emotional empathy with a partner and especially in training and education. Therefore, empathy is considered a professionally important quality of a teacher and a doctor.

5 Conclusion

In our study, it was found that empathy distinguishes the following components: cognitive, emotional and active. The formation of empathy mechanisms is carried out through the implementation of the model of the special course "Empathic culture of the student-future teacher":

- the use of active teaching methods for students;
- using the method of empathic reading;
- theatricalisation of literary works;
- pedagogical practice of students in school;
- mentorship in children's theater "Rainbow" of the Kazan Federal University.

Implementation of the special course allowed to develop three components of empathy in the experimental group: emotional component, cognitive component and activity component. The data of our study showed that students of a pedagogical university demonstrated dynamics in the developmental level of empathy. The general assessment of the non-verbal repertoire in terms of its diversity, harmony: high – more by 3.4%, average – more by 8.3%, low – less by 11.7%. Sensibility, sensitivity of a person to another's non-verbal behaviour of another: high – more by 3.3%, average – more by 8.3%, low – less by 9.6%. The ability to use one's non-verbal repertoire appropriately to the purpose and situation of communication: high – more by 3.4%, average – more by 4.6%, low – less by 8%. We can see the dynamics in the development level of emotional response in the experimental group. Very high – more by 6.7%, high – 6.7%, average – less by 1.6%, low – less by 5%, very low – less by 6.7%. According to the results of diagnostics, it can be stated that the average optimal level of emotional response prevails in 27 respondents (45%), 23.3% of respondents have a high level of emotional response. Eight people have a very high level (13.4%). A very low level was found in 2 people (3.3%). The diagnosis showed that the high level of communicative control in the experimental group increased by 3.3%, the average level decreased by 6.7% and the low level decreased by 10%.

The results of this study can be used in the training of students – future teachers of elementary school and students of medical universities majoring in "General Medicine".

This paper has been supported by the Kazan Federal University
Strategic Academic Leadership Program (PRIORITY-2030).

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Mehanizmi za oblikovanje empatične kulture študentov

V procesu strokovnega usposabljanja bodočih učiteljev in zdravnikov je še posebej pomembno razvijati empatično kulturo kot temeljno strokovno kvaliteto sodobnega specialista (Lepičnik-Vodopivec, 2003). Komunikacija ima v pedagoški praksi ključno vlogo, saj je temeljna sestavina uspešne pedagoške prakse, ki omogoča bolj sodelovalno in izpolnjujočo učno izkušnjo za vse vpletene (Klopčič idr., 2016). Empatična komunikaci-

ja vključuje sprejemanje, dopuščanje različnih perspektiv in čustev pri drugih ljudeh ter njihovo deljenje, tako da se omogoči ustrezna spodbuda in podpora. Učitelji, zdravniki in drugi zdravstveni delavci izvajajo aktivnosti v sistemu z neposredno komunikacijo, kjer se poskušajo primerjati z drugimi ljudmi, "razumeti" izkušnje in občutke drugega človeka, se postaviti v njegovo vlogo ter zavzeti položaj komunikacijskega partnerja (Šimec idr., 2022). Težava je v tem, da se v procesu izobraževanja in usposabljanja študentov medicine in drugih zdravstvenih delavcev veliko pozornosti posveča pridobivanju kliničnih veščin in spretnosti, premalo pa empatiji. Empatija zdravnika se kaže v sposobnosti občutiti empatijo in razumeti čustveno stanje bolnika, sočustvovati z njim.

Pedagoška dejavnost je povezana z veliko čustveno obremenitvijo učitelja. Najpomembnejša učiteljeva moralna lastnost, ki prispeva k oblikovanju njegove profesionalne komunikacijske kompetence, je empatija v odnosih z ljudmi. Empatija prispeva k uravnoteženosti medosebnih odnosov, moralni rasti osebe in učinkovitemu medsebojnemu razumevanju. V razmerah pomanjkanja topline medčloveških odnosov, ostrih negativnih sprememb v družbenoekonomski strukturi se ljudje soočajo z osamljenostjo in brezbrižnostjo okolja (Dolgova in Melnik, 2014).

Empatična kultura učitelja je integrativna lastnost, ki se kaže v sposobnosti čustvenega odzivanja na občutke učencev, vzpostavljanja odnosov z njimi in upoštevanja njihovega notranjega položaja. Empatija je kazalnik poklicnega uspeha učiteljev in zdravnikov. V zvezi s tem je treba pomembno preučiti mehanizme oblikovanja empatije kot poklicno pomembne lastnosti. Problem empatije je vključen v krog splošnih problemov oblikovanja osebnosti kot znanstveni problem. Brez njegovega razumevanja je težko opraviti analizo mehanizmov in temeljnih lastnosti duhovnega in moralnega razvoja osebe. Številni tuji avtorji, kot so Jung (1996), Lipps (1907), Rogers (1994) in Kohut (2000), so preučevali empatijo v njenih različnih oblikah. Lipps (1907) je vsebino empatije predstavil kot samoobjektivizacijo v predmetu, ki je drugačen od mene, ne glede na to, ali si objektivizirano ime občutek zasluži ali ne. Po Rogersu (1994) mora imeti učitelj naslednje sposobnosti: željo po čim večji prilagodljivosti sposobnosti empatije, občutljivost za potrebe učencev; zmožnost osebnega obarvanja procesa izobraževanja in usposabljanja; odnos do ustvarjanja pozitivnih spodbud za samopodobo otrok; način lahkotne, neformalne in tople komunikacije z otroki; čustveno ravnovesje, samozavest in veselje.

Kohut (2000) je menil, da je empatija univerzalna razvojna potreba. Dojenčkova izkušnja empatičnega "zrcaljenja" skrbnika je nujna sestavina razvoja povezanega jaza in nasprotno. Travmatične napake pri zagotavljanju empatičnega "zrcaljenja" imajo ključno vzročno vlogo pri razvoju pomanjkljivosti in patologije jaza. Zhou idr. (2021) so naredili sistematičen pregled pristopov k poučevanju in ocenjevanju empatije v medicini in ugotovili, da je empatija ena od ključnih kompetenc zdravstvenih delavcev, ki jo lahko uporabijo za uspešno oskrbo bolnikov. Visoka raven empatije je bistvena za razvoj profesionalizma pri študentih, ki se usposabljajo za zdravstvene poklice. Drugi znanstveniki (Krishnasamy idr., 2019) so opravili raziskave o tem, kako zaznave študentov medicine in učiteljev vplivajo na empatijo; kako izobraževanje vpliva na empatijo in kako se pri študentih medicine izraža sočutje. Rezultati raziskav vključujejo tudi vlogo visokošolskih učiteljev, ki pripravljajo in izvajajo izobraževanje po učnih načrtih za področje zdravstva. Yu idr. (2022) so preučevali empatijo pri študentih, učiteljih in zdravnikih ter opredelili tri dejavnike stabilnosti empatije, ki so temelj posameznikove lastnosti empatije. Dejavniki nizke stabilnosti so tisti, ki so zelo specifični za določen

položaj, in dejavniki srednje stabilnosti so tisti, ki so v okolju trajni in lahko dolgoročno vplivajo na raven empatije. Znanstvenika Sobczak in Popowicz (2019) sta primerjala ravni in lestvice empatije pri študentih, ki se izobražujejo po različnih izobraževalnih strategijah: študentih medicinskih specializacij, zdravstvene nege, porodništva, fizioterapije, psihologije, pedagogike in sociologije. Znanstveniki so opazili resen upad ravni empatije med študenti medicine. Empatija pri študentih upade po tretjem letniku študija, ne glede na vrsto univerze. Kanchan idr. (2018) menijo, da je zdravniški poklic pod drobnogledom zaradi vse slabše kakovosti zdravstvenih storitev. Ta upad pripisujejo slabšanju človeških vrednot ter pomanjkanju empatije in komunikacijskih spretnosti med zdravniki. Geoffrey (2017) je ugotovil, da je medicinski poklic v svojem profesionalizmu in praksi sprejel kognitivni model empatije ali distancirane skrbi. Trenutno obstaja vrzel v zdravniški empatiji, kar dokazujejo izpadi v oskrbi bolnikov v Združenem kraljestvu. Pri študentih medicine se lahko tudi med študijem razvijejo primanjkljaji empatije. Skupina znanstvenikov (Lermen idr., 2022) je na podlagi študije o stopnji empatične komunikacije med študenti ugotovila, da je empatija pomembna sestavina osebnostnih lastnosti, prav tako pa sposobnost obvladovanja čustev vpliva na kakovost komunikacije med njimi in bolniki.

Nemov (1999) predlaga več klasifikacij vrst empatije: čustvena empatija, kognitivna empatija, predikativna empatija, estetska empatija, egocentrična empatija in humanistična empatija. Zakharova idr. (2019) preučujejo empatijo kot osnovo komunikacije med zdravnikom in pacientom, obravnavajo razvoj empatičnega vedenja pri bodočih učiteljih in zdravnikih. Podana je analiza stališč ruskih in tujih znanstvenikov, ki odražajo bistvo pojma "zdravniška empatija". Empatija je jedro medosebnih odnosov, ki temeljijo na učinkoviti strokovni komunikaciji med zdravniki in bolniki. Shkitina idr. (2014) razkrivajo značilnosti pedagoške empatije. Menijo, da empatija v poklicnem delovanju učitelja naj ne bo toliko orodje kot glavna strategija njegovega delovanja. Za učitelja je empatija kompleksnejša lastnost, ki predstavlja organizacijo določenega vzgojnega vpliva. Rezultat tega ne bo vedno produktivna komunikacija med učiteljem in učencem, saj lahko vzgojno-izobraževalni proces zaradi resnih vplivov več naključnih dejavnikov poteka po svoje in uide izpod nadzora. Osebnostne lastnosti učitelja so neločljivo povezane s strokovnimi kompetencami. Podlasy (2004) k tem poklicnim kompetencam prišteva znanstveno navdušenje, ljubezen do svojega poklicnega dela, erudicijo, obvladovanje predmeta in učnih metod, obvladovanje tehnologij pedagoškega dela, organizacijske sposobnosti in spretnosti, pedagoški takt, obvladovanje komunikacijskih tehnologij, govorništvo in duhovno občutljivost. V procesu preučevanja poklicne komponente psihološke in pedagoške kompetence učitelja sta Sinyagina in Derkach (1998) razkrila, da učiteljeva empatija skupaj z refleksijo, fleksibilnostjo, družabnostjo in sposobnostjo sodelovanja spodbuja stanje čustvenega ugodja, intelektualno dejavnost, ustvarjalno iskanje in medsebojno razumevanje v odnosih z učenci. Analiza psihološke in pedagoške literature kaže zanimanje raziskovalcev za empatijo in nam omogoča, da empatijo opredelimo kot osebnostno lastnost, ki se izraža v sočutju in zavzetosti na podlagi genetsko pogojenih sposobnosti projekcije in čustvenega odziva na drugo osebo.

Namen študije je bil teoretično utemeljiti in eksperimentalno preveriti ravni oblikovanja empatične kulture pri študentih pedagoških in medicinskih univerz.

Cilji raziskave so bili naslednji:

- *ugotavljanje najučinkovitejših metod za oblikovanje empatije pri študentih pedagoških in medicinskih smeri;*
- *eksperimentalno preverjanje stopnje oblikovanja empatije pri študentih pedagoških in medicinskih univerz;*
- *razvoj posebnega predmeta za oblikovanje empatije pri študentih pedagoške univerze.*

Za preverjanje hipoteze smo uporabili različne metode, ki se med seboj dopolnjujejo: opazovanje, sumativno in formativno pedagoško ocenjevanje, spraševanje, testiranje in analizo rezultatov eksperimentalnega dela. V okviru študij sta avtorja uporabila kvantitativni pristop s tehniko anketiranja, v kateri je sodelovalo 65 študentov prvega letnika, smeri splošna medicina, Fakultete za splošno medicino Kirovske državne medicinske univerz ter 60 študentov prvega letnika izobraževalnega programa Primarno izobraževanje in tuji (angleški) jezik Inštituta za psihologijo in izobraževanje Kazanske zvezne univerze.

Raziskava je pokazala, da se študenti razlikujejo glede na naslednje komponente empatije: kognitivna, čustvena in aktivna. Oblikovanje mehanizmov empatije poteka z izvajanjem modela posebnega predmeta, ki je poimenovan Empatična kultura študenta in prihodnjega učitelja: uporaba aktivnih učnih metod za študente, uporaba metode empatičnega branja, teatralizacija literarnih del, pedagoška praksa študentov v šoli, mentorstvo v otroškem gledališču Mavrica Kazanske zvezne univerze.

Rezultati so pokazali, da so študenti pedagoške univerze pokazali dinamiko v stopnji razvoja empatije. Glede na rezultate diagnostike lahko ugotovimo, da prevladuje povprečna raven čustvenega odziva pri 45 % anketiranih, 23,3 % anketirancev pa ima visoko raven čustvenega odziva. Zelo visoko raven ima 13,4 % anketirancev. Zelo nizka raven se je pokazala pri 3,3 % anketirancev. Rezultate te študije je smiselno uporabiti pri usposabljanju študentov oz. bodočih učiteljev v osnovni šoli in študentov medicinskih univerz na področju splošne medicine.

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   - For articles in journals: the author's surname and name, year of publication, title of the journal, volume, number, pages. For example: Strmčnik, F. and Kramar, M. (2017). Reševanje problemov kot posebna učna metoda. Pedagoška obzorja, 12(5), 3.
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8. The inclusion of references in the text: If it is an exact reference, the surname, the year of publication and the page should be written in brackets (Kroflič, 2017, p. 15). If it is a general reference, the page is omitted (Kroflič, 2017).
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