IPA

Filozofski fakultet

Nastava i vaspitanje

Studies in Teaching and Education

2

2026

Nastava i vaspitanje

2 | Beograd, 2026.

NASTAVA I VASPITANJE God. 75 Broj 2. str. 261–396 ISSN 0547-3330 eISSN 2560-3051 UDK 37

Izvršni izdavač:
Pedagoško društvo Srbije
Terazije 26, 11000 Beograd
tel. 011 268 77 49
www.pedagog.rs
E-mail: casopis@pedagog.rs

Suizdavač:
Institut za pedagogiju i andragogiju Filozofskog fakulteta Univerziteta u Beogradu
Čika Ljubina 18-20, 11000 Beograd
tel. 011 3282 985

Za izvršnog izdavača
Ivan Davidović

Za suizdavača
Dr Lidija Miškeljin

Glavni i odgovorni urednik
Dr Milan Stančić, vanredni profesor,
Filozofski fakultet, Univerzitet u Beogradu

Uredništvo
Dr Lidija Vujičić (Lidija Vujičić), redovni profesor,
Učiteljski fakultet Sveučilišta u Rijeci,
Hrvatska
Dr Julijana Vučo, redovni profesor u penziji,
Filološki fakultet, Univerzitet u Beogradu
Dr Pavel Zgaga (Pavel Zgaga), redovni profesor,
Pedagoški fakultet, Univerzitet u Ljubljani,
Slovenija
Dr Saša Milić, vanredni profesor,
Filozofski fakultet u Nikšiću, Univerzitet
Crne Gore
Dr Vladeta Milin, docent,
Filozofski fakultet, Univerzitet u Beogradu
Dr Lidija Miškeljin, vanredni profesor,
Filozofski fakultet Univerziteta u Beogradu
Dr Ilke Paršman (Ilke Parchmann),
Lajbnic institut za pedagogiju Prirodno-matematičkog
fakulteta, Univerzitet u Kielu, Nemačka
Dr Jan Peters (Jan Peeters), redovni profesor,
Centar za razvoj na ranom uzrastu Odeljenja za studije
socijalne zaštite, Univerzitet u Gentu, Belgija
Dr Rosica Aleksandrova Penkova, redovni profesor,
Odeljenje za obrazovanje nastavnika, Univerzitet „Kliment
Ohridski" u Sofiji, Bugarska
Dr Lidija Radulović, vanredni profesor,
Filozofski fakultet, Univerzitet u Beogradu
Dr Mirjana Senić Ružić, docent,
Filozofski fakultet, Univerzitet u Beogradu
Dr Alla Stepanovna Sidenko, redovni profesor,
Akademija za obrazovanje nastavnika Državnog univerziteta
„Lomonosov" u Moskvi, Rusija
Dr Jelisaveta Todorović, redovni profesor,
Filozofski fakultet, Univerzitet u Nišu

Međunarodni izdavački savet
Dr Ondrej Kaščak (Ondrej Kaščák), redovni profesor,
Pedagoški fakultet, Univerzitet u Trnavi, Slovačka
Dr Nataša Lacković (Natasa Lackovic), viši predavač,
Odeljenje za istraživanja u obrazovanju, Univerzitet
u Lankasteru, Ujedninjeno Kraljevstvo
Dr Monika Miler (Monika Miller), redovni profesor,
Institut za likovnu umetnost, muziku i sport, Univerzitet
obrazovanja u Ludvigsburgu, Nemačka
Dr Snežana Lorens (Snezana Lawrence), viši predavač,
Odeljenje za inženjerstvo, dizajn i matematiku,
Midlseks Univerzitet London, Ujedinjeno Kraljevstvo
Dr Goran Bašić (Goran Basic), vanredni profesor,
Fakultet društvenih nauka, Univerzitet Linijus
u Vekšeu, Švedska
Dr Mitja Krajnčan (Mitja Krajnčan), redovni profesor,
Pedagoški fakultet, Univerzitet Primorska u Kopru,
Slovenija
Dr Sofija Vrcelj (Sofija Vrcelj), redovni profesor,
Filozofski fakultet, Sveučilište u Rijeci, Hrvatska

Sekretari redakcije
Tijana Milešević, Pedagoško društvo Srbije
MA Tamara Injac, Institut za pedagogiju i andragogiju
MA Zorana Pešić, Institut za pedagogiju i andragogiju

Lektor za srpski i engleski jezik
Ružica Milovanović

Tehnički urednik
Jelena Panić

Štampa
„Službeni glasnik" d. o . o.

Tiraž
50

Izdavanje časopisa finansijskim sredstvima pomaže
Ministarstvo nauke, tehnološkog razvoja i inovacija
Republike Srbije i Filozofski fakultet Univerziteta u
Beogradu

Indeksiranje časopisa: SCIndeks, ERIH PLUS, CEEOL,
Redalyc

Na godišnjem nivou objavljuju se tri sveske časopisa.

NASTAVA I VASPITANJE • SADRŽAJ

265-286	*Zoran Pešić*	MOGUĆNOSTI PRIMENE VEŠTAČKE INTELIGENCIJE I DIGITALNIH ALATA U NASTAVI PREDMETA MEĐUNARODNI ODNOSI
287-303	*Uroš Ćemalović*	OBRAZOVANJE O UBLAŽAVANJU KLIMATSKIH PROMENA I VEŠTAČKA INTELIGENCIJA – KRITIČKA I EMPIRIJSKA ANALIZA
305-324	*Stanislava Marić Jurišin* *Borka Malčić* *Snežana Jokić* *Simona Bekić*	LIČNE I ŠKOLSKE KARAKTERISTIKE KAO PREDIKTORI SINDROMA SAGOREVANJA NASTAVNIKA U SRBIJI
325-338	*Snežana Štrangarić* *Vesna Rodić Lukić*	KUĆNA BIBLIOTEKA KAO MEDIJATOR ODNOSA IZMEĐU OBRAZOVANJA RODITELJA I POSTIGNUĆA UČENIKA NA PISA TESTIRANJU U SRBIJI
339-353	*Milena Letić Lungulov* *Jovana Turudić* *Saška Radujkov*	POVEZANOST LIDERSKIH VEŠTINA I AKADEMSKOG POSTIGNUĆA STUDENATA PEDAGOGIJE: IMPLIKACIJE ZA RAZVOJ KURIKULUMA
355-372	*Maja Veljković Michos* *Valentina Bošković Marković* *Sacmir Seferović*	DIGITALNA PISMENOST I DIGITALNA KOMPETENCIJA U NASTAVI ENGLESKOG KAO STRANOG JEZIKA: STAVOVI NASTAVNIKA I PEDAGOŠKA STVARNOST
373-391	*Mirna Vidaković*	VRŠNJAČKA POVRATNA INFORMACIJA I USMENO IZLAGANJE U NASTAVI ENGLESKOG JEZIKA STRUKE: PERCEPCIJE STUDENATA I PEDAGOŠKE IMPLIKACIJE
393-396	*UPUTSTVO ZA AUTORE*	

STUDIES IN TEACHING AND EDUCATION • CONTENTS

399-419	*Zoran Pešić*	THE POSSIBILITIES OF APPLYING ARTIFICIAL INTELLIGENCE AND DIGITAL TOOLS IN THE TEACHING OF INTERNATIONAL RELATIONS
421-436	*Uroš Ćemalović*	EDUCATION ON CLIMATE CHANGE MITIGATION AND ARTIFICIAL INTELLIGENCE – CRITICAL AND EMPIRICAL ANALYSIS
437-455	*Stanislava Marić Jurišin* *Borka Malčić* *Snežana Jokić* *Simona Bekić*	PERSONAL AND SCHOOL-RELATED CHARACTERISTICS AS PREDICTORS OF TEACHER BURNOUT IN SERBIA
457-470	*Snežana Štrangarić* *Vesna Rodić Lukić*	THE HOME LIBRARY AS A MEDIATOR OF THE RELATIONSHIP BETWEEN PARENTAL EDUCATION AND STUDENTS' ACHIEVEMENT ON PISA ASSESSMENTS IN SERBIA
471-485	*Milena Letić Lungulov* *Jovana Turudić* *Saška Radujkov*	THE RELATIONSHIP BETWEEN LEADERSHIP SKILLS AND ACADEMIC ACHIEVEMENT AMONG PEDAGOGY STUDENTS: IMPLICATIONS FOR CURRICULUM DEVELOPMENT
487-501	*Maja Veljković Michos* *Valentina Bošković Marković* *Sacmir Seferović*	DIGITAL LITERACY AND DIGITAL COMPETENCE IN EFL TEACHING: TEACHERS' PERCEPTIONS AND PEDAGOGICAL REALITIES
503-519	*Mirna Vidaković*	PEER FEEDBACK IN ESP PRESENTATION TASKS: STUDENTS' PERCEPTIONS AND PEDAGOGICAL IMPLICATIONS
521-524	*CONTRIBUTORS' NOTES*	

Nastava i vaspitanje, 2026, *75*(2), 265-286
https://doi.org/10.5937/niv75-65332

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Mogućnosti primene veštačke inteligencije i digitalnih alata u nastavi predmeta Međunarodni odnosi

Zoran Pešić[1]
Fakultet za poslovne studije i pravo, Univerzitet Union - Nikola Tesla, Beograd, Srbija

Apstrakt *Cilj ovog rada jeste da prikaže i analizira mogućnosti, domete i ograničenja primene veštačke inteligencije (VI) i digitalnih alata (DA) u nastavi međunarodnih odnosa, polazeći od specifičnosti ove naučne discipline i savremenih tendencija u digitalizaciji obrazovanja. Razmatra se u kojoj meri je moguće integrisati VI i DA u nastavu, a da se pritom ne izazovu negativne posledice po nastavnike i studente. Rad je strukturiran u tri celine: teorijski okvir, koji ukazuje na značaj VI i DA u proučavanju međunarodnih odnosa; konkretizaciju primene VI i DA u nastavnom procesu; te analizu implikacija i izazova njihove upotrebe. Identifikovane su tri oblasti primene, pri čemu je poseban akcenat stavljen na metodičko-didaktičku pripremu nastavnika, personalizovano učenje, analizu međunarodnih događaja u realnom vremenu, kao i na pisanje i analizu dokumenata i predviđanje trendova na nivou međunarodnog sistema. Rad ukazuje na ulogu VI i DA u unapređenju procesa učenja, razvoju digitalne pismenosti i povezivanju teorije i prakse. Predstavljeni su određeni digitalni alati i oblasti primene, uključujući i konkretizaciju za pojedine nastavne teme u okviru predmeta Međunarodni odnosi. Istovremeno se razmatraju implikacije primene novih tehnologija, etičke dileme, pitanja zaštite podataka, algoritamska pristrasnost, akademska čestitost, kao i rizik od pasivizacije studenata i smanjenja kritičkog mišljenja. U radu se koriste analitičko-sintetička metoda, kao i metode dedukcije, analogije, generalizacije i konkretizacije. Zaključuje se da VI i DA mogu da značajno unaprede nastavu međunarodnih odnosa, ali da njihova primena zahteva promišljen pristup, jasno definisane pedagoške ciljeve i odgovarajući nadzor.*

Ključne reči: *veštačka inteligencija, nastava međunarodnih odnosa, digitalni alati, implikacije, etičke dileme.*

1 zoran.pesic@fpsp.edu.rs

Uvod

Veštačka inteligencija i digitalni alati, kao novi i neizbežni deo naše stvarnosti, imaju snažan uticaj na sve oblasti života, uključujući i savremeno obrazovanje. Integracija u obrazovanje transformiše i proces učenja, čime se otvaraju nove mogućnosti mimo tradicionalnog pristupa. Uticaj veštačke inteligencije (VI) i digitalnih alata (DA) može se ispoljavati u sticanju novih znanja, kroz promenu prakse, ovladavanja novim veštinama i u metodičko didaktičkoj pripremi za izvođenje nastave. Međunarodni odnosi (MO) i spoljna politika (SP) veoma se brzo i dinamično menjaju, kao i savremeni svet u celini, zbog čega udžbenici, pa čak i sadržaji u časopisima, postaju brzo zastareli. Upotreba veštačke inteligencije i savremenih digitalnih alata omogućuje studentima da na poseban način proučavaju subjekte međunarodnih odnosa, njihovo ponašanje, diplomatiju, konflikte i javno mnjenje u realnom vremenu, analizirajući mnoštvo faktora uticaja. Na taj način se brže uočavaju globalni ili regionalni trendovi, čime se doprinosi razumevanju i predviđanju političkih procesa. Međutim, primena VI i DA, pored značajnih mogućnosti i pozitivnih efekata, proizvodi i rizike koji otvaraju tehničke, metodološke, humanističke i etičke dileme, pri čemu ključni problem nije sama upotreba, već pitanje njihove kontrole i upravljanja. Cilj rada je da se prikažu i analiziraju mogućnosti primene VI i DA u nastavi predmeta Međunarodni odnosi, sa posebnim osvrtom na njihove potencijale, ograničenja i njihovu ulogu u nastavnom procesu. Pri tome, primena VI i DA ne bi trebalo da stvore negativne posledice i dodatne probleme za predavače i studente.

Društveni značaj primene VI i digitalnih alata u nastavi MO ogleda se u novom pristupu znanja, u širenju znanja, kao i pripremi studenata za sve složeniju, međusobno povezanu globalnu stvarnost. Sa naučnog stanovišta, ovi alati revolucionarno menjaju metodologiju istraživanja i učenja, čime se unapređuje empirijska utemeljenost discipline i podstiče interdisciplinarnost. Primer toga jeste povezivanje međunarodnih odnosa sa računarskim, pedagoškim i drugim naukama, što omogućava nastavu fokusiranu na veštine interpretacije, analitičke sposobnosti i etičke procene, a ne samo na usvajanje činjenica. Značaj teme treba tražiti i u konkretnim predlozima primene VI i DA u nastavi međunarodnih odnosa, kao i činjenici da se akademska javnost ovom temom retko bavi.

Teorijski okvir

Predmet međunarodnih odnosa (MO) predstavlja „proučavanje odnosa između subjekata MO, procesa koji nastaju između njih, njihovu zavisnost, razvojnost, uslovljenost i organizovanost, s ciljem saznanja i razumevanja njihove prirode, predviđanja njihovog razvoja i mogućeg uticaja u praksi“ (Pešić, 2023, str. 17). Ovako široko postavljen predmet ukazuje na kompleksnost discipline, budući da obuhvata kako pojave koje suštinski pripadaju međunarodnim odnosima, tako i one koje posredno utiču na njihovu dinamiku. Konkretnije, MO proučavaju funkcionisanje međunarodnog sistema koji je anarhičan usled odsustva naddržavnog autoriteta, što dodatno usložnjava mogućnosti

predviđanja. U tom okviru se analizira uloga država i drugih subjekta, pri čemu se njihovi odnosi kreću u rasponu između saradnje i konflikta. Međutim, redukcija ovih odnosa na dihotomiju saradnja-sukob pokazuje se nedovoljnom, te zahteva primenu različitih teorijskih perspektiva. Shodno tome, nauka o MO, pored deskripcije i eksplanacije, teži i predikciji i u ograničenoj meri, preskripciji ponašanja aktera. Iako je formulisanje univerzalnih rešenja često nedostižno, u pojedinim kontekstima moguće je ponuditi analitički utemeljene preporuke. Upravo u tom prostoru javlja se potencijal primene VI i digitalnih alata. Primena VI i DA u nastavi MO može se adekvatno razumeti samo u okviru širih teorijskih pristupa ovoj disciplini. Savremena naučna rasprava razvija se oko dileme da li VI predstavlja novu varijablu unutar postojećih teorijskih paradigmi ili otvara pitanje potrebe za novim analitičkim okvirima. U literaturi se posebno izdvajaju rasprave o VI kao faktoru transformacije moći i bezbednosnih odnosa (Bode, 2024), predmetu globalnog upravljanja (Emery-Xu et al., 2024) i izazovu za preispitivanje tradicionalnih koncepata suvereniteta, aktera i odlučivanja (Srivastava & Bullock, 2024). Različite teorije MO, prema svojim najvažnijim konceptima, pružaju različite perspektive o ulozi znanja, podataka i analitičkih alata u razumevanju međunarodne stvarnosti. Nastavnici i studenti mogu analizirati moć, identifikovati obrasce ponašanja i vršiti predviđanje ponašanja aktera, što je realistička perspektiva. Iz perspektive liberalizma, analiziraju se značaj međunarodnih institucija i međuzavisnost, pri čemu VI i DA doprinose analizi složenih interakcija i procesa globalnog upravljanja. Analizom diskursa, identiteta i interpretacija sa stanovišta konstruktivizma, studenti i nastavnici otvaraju i pitanje u kojoj meri algoritamski sistemi mogu adekvatno razumeti društveno konstruisana značenja i narative koji oblikuju međunarodne odnose. Međutim, ako primena VI u nastavi MO zavisi od nastavnika i faktora koji se relativno mogu kontrolisati, ostaje otvoren problem upravljanja u praksi, jer za sada postoji samo „fragmentisana struktura globalnog upravljanja veštačkom inteligencijom" (Klein & Patrick, 2024, str. 30), što podseća na anarhičnu prirodu međunarodnog sistema. Zbog toga što VI redefiniše tradicionalno poimanje moći i time postaje glavni eksponent moći, postoji diskrepancija između onih koji je razvijaju i potrebe da se ona kontroliše globalno.

Veštačka inteligencija „označava simulaciju procesa ljudske inteligencije pomoću mašina. VI omogućava mašinama da obavljaju zadatke koji obično zahtevaju ljudsku inteligenciju. Ti zadaci uključuju učenje, rezonovanje, prepoznavanje obrazaca, rešavanje problema, predviđanje, opažanje i razumevanje jezika" (Center for Innovation, Design, and Digital Learning, 2024, str. 10). Ovi zadaci se u manjoj ili većoj meri primenjuju i u MO, na različite načine i u različitim ulogama.

Razmatranje primene VI i digitalnih alata u nastavi međunarodnih odnosa zahteva jasno teorijsko razgraničenje i konceptualizaciju ovih pojmova. Veštačka inteligencija podrazumeva sisteme koji su sposobni za obradu podataka, prepoznavanje obrazaca i donošenje odluka na osnovu algoritamskih modela, dok digitalni alati obuhvataju širi spektar softverskih rešenja koja podržavaju prikupljanje, organizaciju i prezentaciju informacija. U kontekstu nastave, ova razlika ima značajne implikacije. Dok digitalni alati prevashodno omogućavaju tehničku podršku nastavnom procesu, sistemi zasnovani na

veštačkoj inteligenciji imaju potencijal da utiču na sam proces učenja, kroz personalizaciju sadržaja, analizu podataka i generisanje novih informacija.

Veštačka inteligencija najviše se ispoljava kroz praksu u MO upotrebom informatičkih alata u SP, diplomatiji, prikupljanju podataka i analizama. U bezbednosnoj sferi podstiče razvoj i upotrebu sofisticiranih sistema i borbenih sredstava. Sve više transformiše moć u teorijskom i praktično!m smislu, postajući predmet intenzivnih diplomatskih aktivnosti, stvarajući nove odnose, saveze i podele. Shodno ofanzivnom realizmu, „države koriste veštačku inteligenciju radi maksimizacije relativne moći, često po cenu narušavanja globalne stabilnosti" (Garrido Rebolledo, 2025, str. 13). To, naravno, utiče na MO, nauku o MO i na ustaljene teorijske paradigme. Razlog je što teorije MO analiziraju međunarodne događaje, polazeći iz „antropocentrične perspektive, dok VI analizira situaciju u različitim oblastima MO kroz algoritme, oblikuje je i konstruiše, utičući na proces donošenja odluka" (Kardumyan, 2025, str. 132). Istovremeno, predmet MO mora da prati i da se usklađuje prema međunarodnim događajima u svetu i promenama u naučnoj disciplini. U tom kontekstu je od izuzetnog značaja način podučavanja, učenja i primene znanja. Tradicionalne nastavne metode ne mogu da prikažu svu kompleksnost i dinamičnost promena u MO, kao ni da budu dovoljne za znanje i razumevanje od strane studenata. Predavanja zahtevaju mnogo veću inventivnost od predavača, a od studenta interaktivno delovanje i usvajanje znanja. S druge strane, promene donose prednosti, ali i rizike, na šta nije imuna ni nastava premeta MO. Između ostalog, VI u nastavi „donosi i značajne etičke dileme i izazove, naročito u oblastima bezbednosti podataka, zaštite privatnosti korisnika i algoritamske pristrasnosti" (Felaco et al., 2024, str. 239).

Mogućnosti primene veštačke inteligencije i digitalnih alata u nastavi predmeta međunarodni odnosi

U nastavnom procesu, veštačka inteligencija može imati ulogu sveobuhvatne podrške nastavniku – od pripreme nastave, preko njene realizacije, do provere znanja i analize efekata – doprinoseći kvalitetnijem i efikasnijem učenju studenata. Grafički prikaz ilustruje širinu mogućnosti primene VI u nastavi.

Grafikon 1

Primena veštačke inteligencije i digitalnih alata u nastavi premeta MO



Napomena. MDP – metodičko-didaktička priprema nastavnika; PU – personalizovano učenje.
Izvor: autor.

Grafički prikaz ukazuje na tri oblasti primene, prva je metodičko-didaktička priprema (MDP), za potrebe nastavnika i njegovu pripremu za izvođenje nastave. Druga oblast je proces učenja (PU) i treću oblast čine analize.

Metodičko-didaktička priprema nastavnika obuhvata opšte i posebne sadržaje.

U opšte sadržaje gde se mogu primeniti VI i DA spadaju:

- Prilagođavanje nastave studentima – optimalan odnos prema studijskom programu, očekivanjima i nivou znanja studenata.
- Određivanje ciljeva učenja – sticanje novih znanja, veština i izgradnja stavova, što podrazumeva razumevanje teorija MO, praćenje i analizu procesa i kritički pristup.
- Izbor i strukturalno uređenje sadržaja – izbor teorijskog okvira, savremeni subjekti MO, aktuelni regionalni i međunarodni problemi.
- Didaktički pristup i izbor metoda – obuhvata izbor nastave prema obliku i metodi rada i njihovo kombinovanje.

- Izbor nastavnih sredstava i izvora – udžbenici, naučni članci, međunarodna dokumenta, saopštenja, statistički podaci, multimedijalni sadržaji.
- Povezivanje teorije i prakse – analiza aktuelnih događaja i spoljne politike konkretnih država.
- Provera i vrednovanje znanja – usmena i pismena provera kroz aktivno učešće: prezentacije, testovi, eseji, seminarski radovi; izrada kriterijuma ocenjivanja, samoprovera.

Zbog širokih mogućnosti primene u metodičko-didaktičkoj pripremi nastave, VI zahteva od nastavnika otvorenost za novine i odgovarajuće znanje u primeni, inventivniji pristup nastavi, veću odgovornost, ali istovremeno i verifikaciju uspeha i adekvatnu stimulaciju. Znanjem o primeni VI i DA u nastavi, nastavnici onemogućavaju „da učenje u velikoj meri zavisi od računarskih stručnjaka koji imaju ograničeno razumevanje uspešne pedagogije" (Dimitriadou & Lanitis, 2023, str. 19). Tu je uloga nastavnika važna zbog povratnih informacija koje pružaju.

Personalizovano učenje je prilagođavanje nastave ili transfera znanja i veština prema mogućnostima svakog pojedinca ili određene grupe, a „prilagodljivost je prepoznata kao jedan od ključnih načina na koje tehnologija može da unapredi učenje" (Cardona et al., 2023, str. 18). Međutim, uprkos značajnim potencijalima, istraživanja ukazuju da u „individualizovanom pristupu studentima, gde su potencijalni dometi VI značajni, njena konkretna upotreba gotovo izostaje" (Polovina i Dinić, 2025, str. 184). Savremena literatura u oblasti primene VI u obrazovanju ukazuje da se personalizovano učenje može sistematizovati u tri osnovne kategorije: personalizovana preporuka sadržaja, personalizovano tutorstvo i podrška, kao i personalizovana povratna informacija i evaluacija (Farhood et al., 2025, str. 20-22). Polazeći od ove klasifikacije i „srodnih koncepta" (Khalifeh et al., 2026, str. 15), u nastavku se prikazuju konkretni oblici personalizacije koji su prilagođeni nastavi međunarodnih odnosa.

Personalizovano učenje obuhvata sledeće sadržaje:

- Prilagodljiv sistem učenja – proces započinje dijagnostikom VI početnog nivoa znanja (testovi i kvizovi) radi inicijalnog prilagođavanja nastavnog okvira, nakon čega se sistem dinamički transformiše tokom celog ciklusa, prateći individualan napredak i potrebe studenta.
- Analiza učenja i stepena usvojenog znanja – praćenje rezultata i identifikacija slabosti i uspeha u svakoj fazi procesa učenja i predlaganje pedagoških rešenja za svakog pojedinačno.
- Personalizacija prema stilu učenja – identifikuju se i individualne sklonosti za auditivno, vizuelno učenje, učenje kroz ponavljanje, interakciju, neposredno iskustvo, praktičnu demonstraciju ili simulaciju.
- Personalizovana preporuka sadržaja, lekcija, literature, dodatnog materijala u skladu sa napredovanjem studenta (Farhood et al., 2025).
- Personalizovano tutorstvo – VI deluje kao virtualni tutor koji pruža podršku i objašnjenja u realnom vremenu (Cardona et al., 2023).

- Personalizovano vrednovanje znanja – prilagođavanje načina ocenjivanja nivou znanja studenta u različitim fazama učenja.
- Povratne informacije nastavniku – VI omogućuje uvid u stepen i kvalitet usvojenog znanja za svakog studenta pojedinačno.

Povratne informacije mogu se prikupljati o svakom pojedincu ili grupi, i na osnovu njih procenjivati uspešnost nastave. Veštačka inteligencija pomaže u identifikaciji ključnih indikatora uspešnosti, obradi podataka i evaluaciji. Analiza obuhvata praćenje napredovanja kroz rezultate na kolokvijumima, testovima, seminarskim radovima i esejima, kao i učešće u debatama, argumentaciji, kritičkom mišljenju i povezivanju teorije s praksom. Na osnovu efekata, mogu se uočiti optimalan stil i tempo učenja, kao i slabe tačke. Značajna je i analiza pisanog izražavanja studenata, posebno u pogledu upotrebe pojmovnog aparata MO, koherentnosti radova i logičke doslednosti argumenata. Procenjuje se i dosledna primena pravila akademske čestitosti u pisanju radova. Istraživanja ukazuju da „najveći rizik predstavlja povećanje broja plagijata, što je u vezi s nekritičkim i neosvešćenim preuzimanjem informacija koje pruža veštačka inteligencija" (Polovina i Dinić, 2025, str. 187). Veštačka inteligencija i DA pomažu i kod analiza rizika i procene potrebnih radnji i postupaka, u cilju sprečavanja neuspeha u učenju. Na kraju, upotrebom VI i DA se može umanjiti subjektivnost u ocenjivanju i mogu se promovisati etičke vrednosti. Takođe je interesantan oblik tutorstva VI koji se može primenjivati, recimo, u metodološkom pristupu ili kontroli primene po unapred definisanim fazama ili koracima u analizi ili rešavanju problema koje student vrši. U spoljnoj politici se može pratiti i usmeravati odlučivanje kao model „standardnih operativnih procedura koje obuhvataju niz pravila i postupaka koji se primenjuju prema datim situacijama" (Pešić, 2023, str. 250). U tom kontekstu, VI daje „povratnu informaciju na nivou pojedinačnih koraka (a ne samo informacija o tome da li je rešenje tačno ili netačno) [što je] verovatno ključni razlog zbog kog je tutorstvo izuzetno efikasno" (Cardona et al., 2023, str. 19).

Učenje kroz dijalog se odnosi na upotrebu VI za izvođenje nastave i diskusiju. Nastavnik može da uz pomoć VI objašnjava sadržaje gradiva sa različitim stepenom složenosti, posebno najvažnije teorije, upoređujući njihove perspektive i načine objašnjenja međunarodnih političkih pojava.

Simulacija i uloge omogućavaju upotrebu VI za simuliranje određenih događaja, subjekata ili institucija i igranje konkretnih uloga. Ona može biti u ulozi protivnika ili partnera. Student koristi *Chatbot* kao eksponenta neke političke opcije, države, teorije, međunarodne organizacije ili partnera za debatu, pregovaranje ili odlučivanje. Komunikacija može biti pisana ili govorna.

Analiza u realnom vremenu odnosi se na praćenje i tumačenje tekućih događaja u MO, posebno kriznih. Čine je sledeći sadržaji:

- Praćenje međunarodnih događaja pomoću alata VI analiziranjem vesti i informacija otvorenog sadržaja.
- Identifikacija najvažnijih subjekta MO u aktuelnom događaju.
- Analiza izvora informacija – stepena verodostojnosti i pouzdanosti.

- Analiza narativa i diskursa – dominantni narativi, stavovi, interesi, ciljevi, sredstva, političke poruke, subjekti koji ih iznose.
- Primena teorija MO u tumačenju događaja – realizam, liberalizam, konstruktivizam itd.
- Procena mogućih i alterantivnih scenarija uz pomoć VI i prognoza.
- Obrada i prikaz podataka – grafikoni, mape, vremenski sled.
- Vrednovanje doprinosa VI i DA – procena istinitosti informacija, pristrasnosti i ograničenosti VI.
- Izrada kratkog pisanog izveštaja ili zaključka kao rezultata analitičko-sintetičkog procesa.

Analiza u realnom vremenu procenjuje stečena znanja i sposobnosti studenata i ukazuje na slabosti koje treba u daljem nastavnom procesu ispraviti. Istovremeno, imajući u vidu da je reč o stvarnim političkim odnosima, njihov razvoj ili rešenja na plastičan način verifikuju analitičke i prediktivne sposobnosti studenta i upotrebu VI i DA.

Pisanje i analiza dokumenata odnosi se na to da veštačka inteligencija može asistirati kod: različitih analiza; pisanja eseja, seminarskih radova, gde može pomoći u formulaciji problema; selekciji izvora i dokumenta; identifikaciji ključnih stavova i potrebnih podataka; ponudi različitih scenarija; upoređivanju konkretnih sadržaja, dokumenta, strategija, modela ili događaja, pri čemu može i izvući zaključke, trendove i predviđanja. Za studente i nastavnike je značajna i analiza primene VI i DA u nastavi. Pisanje i analiza dokumenata je najosetljivije područje primene VI, jer je teško povući jasnu granicu između „autorstva" ili „koautorstva" VI i studenata.

U okviru nastave MO, autor je studentima predstavio metodologiju pisanja radova, a od 2025. godine, informativno, i primenu VI i digitalnih alata. Dok je 2024. primarni problem bilo plagiranje, od 2025. beleži se nagli rast upotrebe generativnih alata. Anketa na uzorku od 48 studenata pokazala je da svi podržavaju primenu nove tehnologije, ali uz deficit funkcionalnog znanja o njenoj upotrebi. Te godine VI je koristilo 24% studenata, ali je samo 11% to transparentno navelo. Analiza 50 radova u aprilu 2026. pokazala je rast upotrebe na 44%, dok je navođenje upotrebe alata ostalo nisko (18%). Istovremeno su uočeni etički i metodološki problemi, posebno nekritičko preuzimanje informacija i fiktivno citiranje. Podaci imaju ilustrativni karakter i deo su šireg istraživanja u razvoju.

Analizu i predviđanje posebno smo odvojili od analize u realnom vremenu, jer se odnosi na upotrebu alata za vizuelne prikaze i analizu trendova na nivou međunarodnog sistema ili zajednice. Razlog je što tu deluje mnoštvo faktora, kao i to što VI može na veoma brz i efikasan način da analizira veliki broj informacija i podataka na globalnom nivou, što bi studentu ili istraživaču oduzelo mnogo vremena. Obrađeni podaci i ponuđeni scenariji zasnovani na dosadašnjem ponašanju subjekata MO, mogu da unaprede predvidljivost ponašanja, odvijanja procesa i posledica.

Digitalni alati i preporuke moguće upotrebe

Da bi se uspešno upotrebila VI u nastavi, neophodno je koristiti različite digitalne alate. Integracija VI u obrazovni proces nije samostalan čin, već zahteva oslonac na širok spektar digitalnih alata koji predstavljaju softverska i informaciono-komunikaciona sredstva. Digitalni alati obuhvataju spektar softvera (za uređivanje sadržaja, analizu, simulaciju), aplikacija za posebne zadatke i platforme (za komunikaciju, diskusiju, saradnju). Primena ovih alata poboljšava kvalitet odlučivanja i produktivnost, pri čemu i suštinski transformiše način sticanja i transfera znanja. Iako se „mnogi studenti bore sa digitalnom pismenošću i sposobnošću da integrišu ove alate u svoj akademski rad" (Leva et al., 2025, str. 1), sveprisutnost digitalnih alata, kao i potreba za njima u nastavi i istraživanjima, prinuđuje sve aktere obrazovanja na ovladavanje ovom tehnologijom. U nastavi MO, digitalni alati postaju ključni za operacionalizaciju složenih teorijskih koncepata. Bez obzira na to da li su komercijalni ili besplatni, oni omogućavaju studentima

Tabela 1

Klasifikacija veštačke inteligencije i digitalnih alata u nastavi međunarodnih odnosa prema teorijskoj i funkcionalnoj primeni

Tip alata	Naziv alata	Osnovna funkcija	Element VI	Nivo primene	Teorijska povezanost (MO)	Uloga u nastavi
VI	ChatGPT	Generisanje teksta, analiza, simulacija	DA	Analitički / interpretativni	Realizam / Konstruktivizam	Analiza scenarija, simulacija pregovaranja
VI	DeepSeek	Analiza podataka, generalizacija odgovora	DA	Analitički	Realizam	Predikcija trendova
VI	Grammarly	Jezička analiza i korekcija zasnovana na kontekstu	DA	Podrška pisanju, stilska i gramatička korekcija	Liberalizam	Akademsko pisanje, fokus na moć i podatke
VI	Elicit	Pretraga naučnih radova	DA	Istraživački, Semantička analiza	Liberalizam Pozitivizam	Analiza literature
DA	Voyant Tools	Analiza teksta	NE	Deskriptivni	Konstruktivizam	Analiza diskursa
DA	Kialo	Argumentacija	NE	Interpretativni	Konstruktivizam	Debata
DA	Khartis	Vizualizacija	NE	Deskriptivni	Realizam	Geopolitika
DA	Google Docs	Kolaboracija	HIBRID	Tehnički/ kognitivni	Liberalizam	Grupni rad
DA	Canva Graphs / Infogram	Vizuelizacija podataka i infografika	NE	Deskriptivni	Liberalizam	Vizuelizacija i mapiranje

Napomena. VI – veštačka inteligencija; DA - digitalni alati; MO – međunarodni odnosi.
Izvor: autor.

da na praktičan način savladaju gradivo i razumeju mehanizme delovanja VI. Polazeći od ranije konceptualno uspostavljenog razgraničenja između VI i digitalnih alata, ovde je težište na njihovoj funkcionalnoj razlici u nastavnom procesu. Dok se VI prevashodno koristi za analitičku, adaptivnu i generativnu podršku, DA imaju pre svega organizacionu, komunikacionu i operacionalnu ulogu u nastavi. U nastavi MO, ova razlika je značajna, jer različite vrste alata doprinose razvoju različitih kompetencija – od analitičkih i interpretativnih do organizacionih i komunikacionih. Na toj osnovi moguća je njihova klasifikacija prema funkcijama i stepenu primene VI, što je prikazano u Tabeli 1.

Iz priložene klasifikacije jasno proizilazi da izbor DA nije slučajan, već je direktno uslovljen teorijskim okvirom i didaktičkim ciljem časa. Prikazana klasifikacija istovremeno ukazuje na suštinsku razliku između alata zasnovanih na VI i šireg spektra digitalnih alata, kao i na mogućnosti njihove primene u nastavi MO. Alati zasnovani na VI omogućavaju napredne analitičke i interpretativne procese, uključujući generisanje sadržaja i simulaciju složenih međunarodnih interakcija. Nasuprot tome, DA bez elemenata VI imaju prevashodno podržavajuću ulogu, omogućavajući organizaciju, vizualizaciju i strukturisanje nastavnog sadržaja. Poseban značaj ima povezivanje ovih alata sa teorijskim pristupima u oblasti MO, (realizam, liberalizam, konstruktivizama), čime se omogućava njihova funkcionalna integracija u nastavi. U MO, ovi alati prvenstveno razvijaju digitalnu pismenost kod studenata, zatim deluju podsticajno, naročito kod obrade obeshrabrujuće velikog broja podataka, iniciraju idejna rešenja i na kraju, doprinose aktivnom učenju kroz primenu u praksi.

Mogućnosti primene veštačke inteligencije i digitalnih alata u obradi tema iz međunarodnih odnosa

Posebni sadržaji, ili konkretizacija primene VI u nastavi predmeta MO, mogu biti raznovrsni i zavise od više faktora, počevši od znanja i umeća nastavnika, ciljeva koji se žele ostvariti, vremena i sredstva koja su na raspolaganju, obima gradiva, programa, do samih studenata. Cilj osnovnog programa je sticanje osnovih znanja iz MO, o procesima i trendovima u praksi, zatim razvijanje veština za njihovu analizu i da studenti steknu adekvatne kompetencije za primenu u praksi i u ekspertskom ambijentu. S obzirom na to da se sadržaji i ciljevi na osnovnom akademskom nivou ne razlikuju suštinski između fakulteta, u nastavku se ukazuje na mogućnosti obrade tema uz pomoć VI i DA. Modeli su ilustrativni i nemaju normativni karakter, već predstavljaju analitički okvir za razmatranje potencijalnih načina integracije VI i digitalnih alata u nastavni proces. Tabela 2 ilustruje osnovni akademski program proučavanja MO i primenu VI i DA u njegovom usvajanju.

Tabela 2

Primena VI i digitalnih alata u obradi tema osnovnih akademskih studija predmeta Međunarodni odnosi

RB	Naziv teme	Način obrade	Digitalni alati
1.	Uvod u MO, pojam predmet i razvoj	Kratka diskusija + pojedinačni rad: student generiše različite definicije MO iz više izvora i poredi ih sa definicijom iz udžbenika	ChatGPT Perplexity, Google Docs
2.	Metod međunarodnih odnosa (pristupi i tehnički postupci)	Grupni rad: izbor jedne savremene krize i predlog metodološkog pristupa (kvalitativni/kvantitativni) uz pomoć VI	ChatGPT, Elicit (free), Zotero
3.	Kratka istorija MO (Peloponeski i svetski ratovi, Vestfalski mir, hladni rat, unipolarnost, multipolarnost)	Interaktivna vremenska linija + diskusija o prelomnim tačkama sistema i poređenje sa savremenim događanjima	TimelineJS, ChatGPT, Google Sheets
4.	Teorije MO	Studija slučaja: Ukrajina, Gaza, Južno kinesko more, Venecuela – analiza iz perspektive realizma, liberalizma i konstruktivizma	TimelineJS, ChatGPT, Google Sheets
5.	Konstruktivistička teorija i diskursi u MO	Analiza diskursa (govori lidera, npr. Trampa u Davosu 2026, Putina u Minhenu 2007, deklaracije) - mini istraživački zadatak	ChatGPT (analiza teksta) Voyant Tools
6.	Subjekti MO (država, nacije, suverenitet, organizacije itd.) suverenitet države vs. ljudska prava (NATO - SRJ)	Pojedinačni rad: mapiranje aktera u jednom savremenom konfliktu (SAD-Iran) VI dijalog: simulacija pozicije jedne države u međunarodnom sukobu	ChatGPT, Miro, draw.io, Kialo Edu
7.	Međunarodne organizacije (UN, OEBS, NATO)	Simulacija rada (sednica Saveta bezbednosti) Korišćenje VI za pretragu i analizu delovanja UN u konkretnom slučaju	ChatGPT (role-play), Google Meet, Docs, Perplexity AI
8.	Transnacionalni subjekti (NVO, pokreti, kompanije, pojedinac)	Studija slučaja: uloga jedne NVO ili kompanije u globalnoj krizi Diskusija: Uloga pojedinaca u MO i Kisindžerova studija o šest lidera i strategija	ChatGPT, Perplexity, Canva
9.	Činioci MO (geografski, ekonomski, vojni, moral, pravo i dr.)	Grupni rad: rangiranje činilaca za izabranu državu i obrazloženje Uz pomoć VI kreiranje mapa uticaja	ChatGPT, Google Sheets, Khartis
10.	Spoljna politika – pojam, odlučivanje, subjekti i sredstva	Simulacija procesa spoljnopolitičkog odlučivanja (kabinet, Vlada, MSP, predsednik) prema političkim sistemima	ChatGPT (multi-role simulation), Miro
11.	Regionalne politike: Balkan, Bliski istok, Azija	Grupni rad: Kosovo i Metohija, Palestina, Liban, Tajvan, posledice po države i međunarodni sistem	ChatGPT
12.	Spoljna politika Srbije i determinante	Analitička vežba: identifikacija determinanti za Srbiju i jednu uporednu državu. Studija slučaja: Spoljno- politički prioriteti Srbije u uslovima multipolarnosti	Perplexity, Google Docs, ChatGPT, Elicit, Zotero
13.	Budućnost međunarodnih odnosa i uloga VI	Diskusija: kako VI menja međunarodne odnose i raspodelu moći u svetu? Kako VI utiče na nastavu – analiza.	ChatGPT

Napomena. RB – redni broj; MO – međunarodni odnosi; *VI* – veštačka inteligencija. *Izvor*: Autor.

U okviru svake od navedenih tema, moguće je izdvojiti ključne koncepte i analizirati ih kroz različite oblike nastavnih aktivnosti, uključujući individualni i grupni rad, studije slučaja, simulacije i analizu diskursa. Na primer, u proučavanju države kao najvažnijeg subjekta MO, moguće je da se analizira odnos nacionalnog identiteta, interesa i suvereniteta kroz interpretaciju političkih govora i praktičnih politika. U diplomatiji i pregovaranju, VI može biti simulacioni akter u pregovorima o realnoj ili izmišljenoj temi, što omogućava studentima razvoj argumentacionih i strateških veština u kontrolisanom okruženju. Slično tome, u analizi globalne bezbednosti i moći, DA omogućavaju prikupljanje i obradu podataka o intervencijama velikih sila, otvarajući prostor za komparativnu analizu njihove efikasnosti i teorijsku interpretaciju. Istovremeno, integracija VI i DA u nastavni proces otvara i metodološka i etička pitanja izrade eseja, seminarskih radova i vežbi. Poželjno je da studenti na kraju navedu ulogu VI i DA u obradi pitanja ili istraživanju, uključujući gde su i za šta korišćeni, kao i uočena ograničenja ili greške. To doprinosi unapređenju primene i razlučivanju uloga između studenta i digitalne tehnologije. Analiza uloge VI i DA treba da bude prisutna i na kraju svakog poglavlja i nakon pređenog gradiva, kako bi nastavnik imao povratnu informaciju o njihovom doprinosu. Time dolazimo do različitih implikacija primene digitalne tehnologije. Dosadašnja analiza ukazuje da VI i DA nude značajan potencijal za unapređenje obrazovanja, ali istovremeno generišu i izazove poput „problema pristupa, inherentne pristrasnosti algoritama i potrebe za sveobuhvatnom obukom nastavnika“ (OECD, 2024, str. 4).

Implikacije upotrebe veštačke inteligencije

Izazovi digitalnog okruženja i vrednosni aspekti nastave

Kao što VI može produbiti jaz u obrazovanju između razvijenih i nerazvijenih zemalja (Klein & Patrick, 2024, str. 30-33), tako njena upotreba može i između studenata da napravi razlike. Nemaju svi studenti znanja i sposobnosti za njeno korišćenje, i o tome se mora voditi računa u nastavnom procesu. Nivo digitalne pismenosti se mora konstanto unapređivati i kod nastavnika i kod studenata, jer je on „od presudnog značaja za unapređenje kvaliteta nastave, izgradnju kvalitetnog i savremenog obrazovnog sistema, kao i za obrazovanje visoko kvalifikovanih kadrova“ (Yi & Wang, 2025, str. 79). Dosadašnji način obrazovanja je relativno svim studentima omogućavao dostupnost informacija i sadržaja gradiva, primenjivane su iste metode izvođenja nastave, vežbi i načini verifikacije. Veštačka inteligencija unosi velike promene i njena svrha je da unapredi nastavu i sticanje znanja, a ne da reprodukuje nove razlike koje s vremenom postaju društveno prihvatljive. Dakle, VI mora da afirmiše jednakost u sticanju znanja i dostupnost svima, a da novi vid transparentnosti i personalizovani pristup mora da obezbedi zaštitu podataka o svakoj ličnosti. Takođe, primena VI ne treba da negira vrednosti dosadašnjeg tradicionalnog pristupa učenju. Ukoliko se student svede na konzumenta informacija i generisanih zaključaka, i njegova uloga pojednostavi na nivo transponenta znanja, a ne

kreatora novog, onda VI ne služi svrsi. Tradicionalni pristup je zahtevao više interakcije, jer je proučavanje složenih problema tražilo timski rad, međusobnu podelu obaveza i dopunjavanje, a što se sa VI može izgubiti. Veštačka inteligencija pomaže procesima u učenju, ali i na neki način dehumanizuje, i svodi ih na algoritamske sadržaje koji su po svojoj prirodi ograničeni i uslovljeni uputstvima koja su im data. Veštačka inteligencija, dostupna studentima i nastavnicima, može ponuditi veliki broj informacija, predstaviti ih i analizirati, ali ne može da nijansirano i kritički posmatra stvarne događaje i postavlja ih u određeni kontekst (Cardona et al., 2023, str. 34-35). Alati zasnovani na VI mogu funkcionisati kao „mašine za gotova rešenja, …[i umanjiti praksu] dubinskog čitanja i time neposredno narušiti osnovu neophodnu za razvoj kritičkog mišljenja" (Hassen, 2025, str. 82). Stavovi 141 nastavnika u istraživanju u Srbiji o rizicima upotrebe VI u nastavi, ukazuju na visok rizik od plagiranja, dok „lične kompetencije pojedinaca - vreme koje provede online, razvoj kritičkog mišljenja i samostalnost pojedinaca - pokazuje tendenciju umerenog i visokog rizika, što nam govori da učestala upotreba VI… može da ugrozi dalje razvijanje ličnih kompetencija" (Polovina i Dinić, 2025, str. 187). Pored ovih navode se i rizici od neproverenih i neprimerenih sadržaja, osnaživanja stereotipa i zloupotrebe. U društvenom kontekstu se VI javlja kao nešto što otvara nove perspektive i mogućnosti, ali i kao inhibicija (Yang et al., 2021, str. 3). Veštačka inteligencija može da generiše i specifična „osećanja koja inhibiraju rad sa njom", odnosno različite forme AI-fobije – „pismenost, zamenljivost, odgovornost i implementabilnost" ali se ovi oblici otpora mogu prevazići „kroz organizacionu stabilnost, odgovarajuće metodološke pristupe i jasno artikulisanu mapu puta" (Lee & Park, 2023, str. 8). Preterana upotreba VI smanjuje međusobnu komunikaciju studenata, podstiče pasivizaciju i umanjuje kritičke sposobnosti razvijene kroz interakciju. Takođe, veoma laka dostupnost sadržaja i informacija, lakoća odgovara na istraživačka pitanja uz pomoć VI, mogu dovesti i do obrasca koji promoviše površnost studenata u pristupu problemima MO (Ustiashvil, 2025, str. 6-7). Može se javiti i neki oblik zavisnosti od VI, iako istraživanja ukazuju na umeren nivo zavisnosti od VI kao i straha od situacije bez prisustva VI (Sağlam & Kalanlar, 2025). Pored svega, VI stavlja sve subjekte pred etički izazov, odnosno koliko njena upotreba, naročito u verifikaciji postignutog, ima moralno opravdanje ili kako postaviti meru njene upotrebe i granicu između ljudskog bića i nje. Zato bi bilo poželjno, da se upotreba VI i DA posmatra iz tri etičke perspektive, etike vrline, deontološke i teleološke. Tako one ukazuju da odgovorna upotreba VI i DA u obrazovanju podrazumeva uspostavljanje dinamičke ravnoteže između razvoja vrlina, poštovanja normativnih okvira i kritičke procene posledica. Etika vrline naglašava potrebu da se VI integriše na način koji podstiče intelektualnu autonomiju, akademski integritet i kritičko mišljenje studenata. Deontološki pristup insistira na jasno definisanim pravilima koja se odnose na transparentnost upotrebe VI i DA, zaštitu podataka i pravičnost u pristupu tehnologijama i poštovanju etičkih principa. Istovremeno, teleološka perspektiva upozorava da etička opravdanost upotrebe VI i DA zavisi od njenih stvarnih efekata na obrazovne ishode, uključujući unapređenje kvaliteta učenja, ali i rizike poput tehnološke zavisnosti i potencijalnog smanjenja kreativnosti. Zato

je neophodno „balansiranje potencijalnih koristi tehnologija VI sa etičkim razmatranjima i rizikom od produbljivanja postojećih nejednakosti“ (OECD, 2024, str. 4).

Percepcije i realnost upotrebe VI i digitalnih alata

U oblasti obrazovanja postoji značajan broj istraživanja koja se bave primenom VI i DA, posebno u kontekstu studenata jezičkih studija. Studija koja analizira i sintetizuje podatke iz 49 studija sa 79 izveštaja o učenju jezika identifikuje ključne moderatore koji utiču na efikasnost VI i „pokazuje da intervencije zasnovane na VI imaju statistički značajan pozitivan uticaj na ishode učenja jezika“ (Wu, 2024, str. 1). Iako su ona ograničena lingvističkim pitanjima, u nedostatku istraživanja u oblasti MO, iz njih se mogu izvući zaključci koji imaju univerzalnu vrednost. Studija istraživanja o percepciji studenata o raspoloživim digitalnim alatima i njihovoj upotrebi na Univerzitetu u Mariboru u Sloveniji „identifikuje nedovoljnu iskorišćenost institucionalnih alata, ograničenu svest o dostupnim resursima i oslanjanje na pretraživače opšte namene, a ne na akademske platforme“ (Leva et al., 2025, str. 1). To je posledica nedostatka informacija o raspoloživim alatima i njihovim mogućnostima, ali i neznanja kako se oni koriste. S druge strane, studenti se afirmativno odnose prema upotrebi VI i digitalnih alata i imaju visoko mišljenje o sopstvenim sposobnostima upotrebe, što anketa ne potvrđuje već „otkriva konzistentan jaz između samopercepcije i stvarne upotrebe“ (Leva et al., 2025, str. 19). Potvrđuje se da studenti i nastavnici nemaju informacije i adekvatno znanje o raspoloživosti digitalnih alata i dometima VI. Drugo istraživanje ukazuje da se „85.2% upotrebe VI odnosi na pomoć pri pisanju eseja, u sažimanju i parafraziranju tekstova, generisanju ideja o načinu realizacije zadataka ili projekata, pa čak i na sugestije o samom sadržaju koji bi trebalo napisati“ (Dakakni & Safa, 2023, str. 7). To govori da se VI koristi kao lakši put, često i neakademski, a da se ona javlja kao problem u verifikaciji i autentičnosti rada i da sve ostale mogućnosti ostaju neiskorišćene. Slaba je uteha što je 100% studenata „odbacilo mogućnost da digitalni botovi zamene nastavnike u procesu učenja“ (Dakakni & Safa, 2023, str. 7). Takođe i nastavnici iskazuju nepoverenje prema VI i učili bi o VI samo da bi uspešno nadzirali studente u njenoj upotrebi. Međutim, nastava na daljinu tokom pandemije COVID-19 nametnula je upotrebu različitih platformi za učenje i donela značajna iskustva. Kao ključni problem pokazao se nedostatak fizičke interakcije, delimično nadomešten tehničkim mogućnostima i inventivnošću nastavnika, ali se potvrdila njena nezamenljiva vrednost. Studenti klasičnih programa obrazovanja su „posebno isticali vrednost diskursa i direktne interakcije licem u lice, navodeći ova iskustva kao ključni deo razumevanja složenih globalnih pitanja“ (Ustiashvil, 2025, str. 6). Ipak, problem zbog nedostatka interakcije moguće je u velikoj meri ublažiti upotrebom aplikacija zasnovanih na slobodnom i otvorenom softveru, kako to istraživanje (Peterson & Finn, 2024) ukazuje na uzorku od 165 nastavnika. U istraživanju je zaključeno da upotreba aplikacija i primena VI ne treba da zavisi samo od nastavnika, već da bi na institucionalnom nivou fakulteti i univerziteti trebali da se „posebno usmere na kadrovsku podršku i da nastavnicima obezbede strukturisane resurse, primere dobre prakse, obuke i mogućnosti

profesionalnog usavršavanja" (Peterson & Finn, 2024, str. 413). Upravo je istraživanje u Kini na uzorku od 494 studenata „ukazalo na značajnu ulogu okruženja koje podržava primenu VI i koje, uz uverenja zasnovanih na očekivanju i vrednosti" (Wang et al., 2023, str. 18) deluje podsticajno da studenti uče o VI i njenoj primeni. Taj podsticaj bi trebalo da daju nastavnici i institucije, pa onda i ostali iz okruženja. Drugi problem *online* nastave je distrakcija pažnje koja ima različite uzroke. Istraživanje sprovedeno u Srbiji na 281 studentu ukazuje da je „okruženje u kojem se nastava i učenje odvija bogato digitalnim distraktorima" (Cvetković i Opsenica-Kostić, 2024, str. 89), što je u korelaciji sa smanjenjem pažnje. Jedno rešenje je „zadavanje zadataka koji imaju visoku vrednost za studente" (Cvetković i Opsenica-Kostić, 2024, str. 89) ili koji zahtevaju više pažnje, kreativnost, koji su dinamični i iz realnog života. Upravo primena VI u kreiranju takvih sadržaja i rešavanju zadataka može da parira drugim digitalnim distraktorima. Pomenuli smo važnost tutorstva VI u personalizovanom pristupu učenja. Međutim, u Centru za VI Univerzitetskog koledža u Londonu smatraju da se tome pridaje mnogo veća pažnja nego što je potrebno, jer takve promene u „suštini podrazumevaju zamenu nastavnika, a daleko su od toga da ponude stvarne i u praksi primenljive rezultate sa značajnim društvenim efektima" (Bulathwela et al., 2021, str. 6). Zbog toga, ovakav pristup u ulaganju i trošenju resursa „nosi rizik pogrešne alokacije sredstava koja su neophodna za unapređenje postojećeg, globalno izraženog nedostatka pristupa kvalitetnom obrazovanju" (Bulathwela et al., 2021, str. 6). To je nesumnjivo tačno, jer i nakon pet godina od tog teksta, u diskusiji o upotreba VI u obrazovanju nije se mnogo odmaklo od pitanja zamene nastavnika. Takođe, izostanak standardizovane i normativne regulative na globalnom nivou ostavlja prostor državama da, u skladu sa sopstvenim mogućnostima i interesima, razvijaju i primenjuju VI. Iako je Evropska unija najviše odmakla u regulaciji VI, u njenom razvoju i dalje zaostaje za SAD i Kinom.

Rezultati istraživanja u Srbiji takođe su interesantni. Istraživanje obavljeno na nastavnicima iz sve četiri naučne grupacije ukazuje da u Srbiji „nastavnici u velikom broju koriste digitalne alate i tehnologije u nastavi – pre svega, prezentacije koje koristi 98.6% nastavnika … digitalne platforme za učenje na daljinu 73.8%, *online* alate različitog tipa, kao što su vežbe, upitnici, kvizovi, testovi i sl. 64.5%, interaktivne vežbe i aplikacije 31.9%" (Polovina i Dinić, 2025, str. 183). Očigledno je da su najprostiji alati najzastupljeniji, dok se složeniji koriste u mnogo manjem obimu. U tome prednjače nastavnici društveno-humanističkog (DH) polja, što je začuđujuće kada se uzmu u obzir mogućnosti u drugim poljima. Imajući u vidu da se DH nauke odnose na čoveka kao promenljivo i teško predvidljivo biće, koje najčešće deluje „prema svojim interesima… i pod uticajem je brojnih unutrašnjih i spoljnih varijabli… opasno je na promenljive elemente primenjivati principe kao u prirodnim i tehničkim naukama" (Anđelković et al., 2023, str. 86). Zato primena VI i DA zahteva dodatnu opreznost. Rezultati istraživanja pokazuju da nastavnici imaju digitalne kompetencije, da se dodatno usavršavaju i da koriste digitalne resurse modifikujući ih i prilagođavajući ih. Međutim u celini samo „41.8% je upotrebilo neki oblik VI u nastavi a [nastavnici DH polja] 61,5%" (Polovina i Dinić, 2025, str. 184). Drugo istraživanje sprovedeno na 74 nastavnika takođe ukazuje na nedovoljnu primenu VI u praksi „iako se

u širem diskursu često govori o brzoj digitalizaciji, podaci pokazuju da postoji jaz između potencijala koji VI nudi i njene realne primene u učionici… [a razlozi su] ograničena kompetentnost nastavnika ..i nedostatak sistemske podrške" (Šović, 2025, str. 15). U nastavi MO sigurno je da postoji potencijal za još veću i kreativniju primenu, jer se VI najviše koristi za sticanje znanja o gradivu a „značajno manje za realizaciju nastave (26.7%) i veoma retko za vrednovanje postignuća studenata (5.7%)" (Polovina i Dinić, 2025, str. 184).

Pomenuta istraživanja dala su još neke rezultate i ukazala na probleme. Recimo, tačnost informacija VI i internet platformi uopšte, proverava „samo 47% studenta na osnovnim i 65% na master studijama" (Leva et al., 2025, str. 20). Kod nastavnika DH polja u Srbiji 53.8% uvek proverava, a 23.1% povremeno, što je stabilna većina (Polovina i Dinić, 2025, str. 185). Ovi pokazatelji ukazuju na potrebu da se u svim fazama obrazovanja i primene VI i digitalnih alata kontinuirano naglašava, pre svega studentima, ali i nastavnicima, značaj provere stečenih saznanja i dobijenih informacija, kao i korišćenja više izvora, kako bi rezultati zadržali akademsku validnost. Takođe, uz koristi od upotrebe VI i DA, bezbednost i zaštita privatnosti moraju biti uvek u prvom planu, jer se sa razvojem VI i one menjaju. Iako je privatnost u drugom planu u odnosu na primarni interes, olakšavanje akademskog rada, istraživanja „ukazuju na to da studenti u obrazovnom procesu ispoljavaju izražene kompetencije u oblastima bezbednosti i zaštite privatnosti, dok i dalje postoji značajan prostor za unapređenje veština kreiranja digitalnih sadržaja i rešavanja problema" (Yi & Wang, 2025, str. 81). S druge strane, nastavnici pokazuju viši stepen svesti o bezbednosnim rizicima, što ne isključuje potrebu za daljom bezbednosnom edukacijom, ali težište treba staviti na primenu VI i digitalnih alata u konkretnim zadacima u okviru predmeta. U okviru istraživanja sprovedenog u Srbiji o obrazovanju u oblasti VI i DA, uočeno je da „većina nastavnika smatra da nije njihov zadatak da studente edukuju o VI" (Polovina i Dinić, 2025, str. 184) i da je to posao institucija ili njih samih, što možemo razumeti ali ne i do kraja podržati. To upućuje na problem distribucije odgovornosti i na potencijalni jaz u institucionalnom pristupu razvoju VI i digitalne pismenosti.

U odnosu na ponekad pasivniji prijem informacija i znanja u tradicionalnom načinu nastave, VI je zahtevnija i otvara nove vidike i izazove. Dodatni problemi proizlaze iz obima informacija koje VI generiše, što otežava njihovu selekciju i kritičku evaluaciju, kao i iz ograničenog pristupa relevantnim bazama podataka. Ovo je posebno izraženo u oblasti MO, gde često nedostaju potpune informacije o donošenju odluka, faktorima koji su ih oblikovali i akterima koji su u tom procesu imali odlučujuću ulogu. Neki podaci su u SP i MO pod velom tajne, ili su dostupni tek mnogo godina kasnije. Kod zahtevnijih istraživanja postoji potreba za mnogo kvalitetnijim alatima, ali oni se po pravilu plaćaju i time su ograničeno dostupni.

Smernice za unapređenje primene VI i digitalnih alata u nastavi

Rezultati navedenih istraživanja osvetljavaju stavove studenata i nastavnika prema digitalnim tehnologijama, koje je neophodno uvažiti uprkos izvesnim razlikama, budući da je njihovo usaglašavanje značajno za efikasniju i održivu primenu ovih tehnologija u nastavi. Nastavnici i studenti nalaze se u interaktivnom odnosu sa institucijama, čija je odgovornost neupitna i koje mogu najviše doprineti inkorporiranju VI i DA u obrazovni proces. Istraživanja takođe ukazuju i na strukturalne probleme, čije rešavanje zahteva sistemski pristup VI i DA u obrazovanju – od društvenog nivoa i političkih odlučilaca, do celokupnog obrazovnog sistema. To podrazumeva jasno sagledavanje koristi i izazova primene VI i DA, kao i formulisanje predloga za unapređenje njihove primene. Normativni okvir je neophodan preduslov. U cilju maksimizovanja koristi i ublažavanja izazova, neophodno je obezbediti institucionalnu podršku kroz resurse, obuke i tehničku infrastrukturu, uz kontinuiranu edukaciju nastavnika i studenata radi unapređenja digitalnih kompetencija. Poseban značaj ima primena hibridnog modela nastave, u kome tehnologija dopunjuje, ali ne supstituiše, pedagošku ulogu nastavnika. Implikacije primene VI i DA pre svega se odnose na transformaciju uloge nastavnika – od prenosioca znanja ka moderatoru, kritičkom posredniku i dizajneru procesa učenja. Istovremeno, neophodno je uspostaviti jasan etički i normativni okvir koji obezbeđuje transparentnost i zaštitu podataka, kao i osmisliti kreativne nastavne zadatke usmerene na rešavanje realnih problema, čime se podstiče angažovano i kritičko učenje.

Polazeći od navedenog, u svojstvu rezimea, dat je sažet tabelarni prikaz ključnih implikacije upotrebe VI i DA.

Tabela 3
Veštačka inteligencija i digitalni alati u nastavi predmeta MO - koristi, izazovi i predlozi

KORISTI
• Povećavaju se online resursi i baze podataka
• VI omogućava lak pristup analitičkim alatima
• Neograničena dostupnost po vremenu, mestu, a delom i po sadržajima
• Digitalnim alatima se relativno lako upravlja i koristi
• Rezultati, dometi i brzina kroz prijatno iskustvo deluju podsticajno na primenu i na integraciju VI i DA u obrazovanje
• Veći stepen predviđanja u MO i SP
• Razvijanje novog vida interaktivnog angažovanja
• Novi kvalitet nastave, vežbi i verifikacije uspešnosti
• Podržava kombinovan sistem nastave
• Automatizovana obrada velikog broja podataka
• Prilagodljivost individualna i različitim grupama po više aspekta
• Zahteva konstantno usavršavanje nastavnika i studenata

IZAZOVI
• Sporo prilagođavanje sistema obrazovanja i konkretnog programa i predmeta MO • Nedostatak integrisanih alata VI za MO i SP • Kvalitet i dometi upotrebe VI i DA zavise od troškova • Nedovoljna stručnost nastavnika i studenata • Slaba dostupnost relevantnih informacija iz oblasti MO utiče na pouzdanost • *Bias* u modelima VI, tj. pristrasnost ili sklonost modela da proizvodi rezultate ili favorizuje sadržaje i obrasce • Umanjivanje kritičkog mišljenja i inventivnosti studenata • Veća interaktivnost sa VI može da dehumanizuje korisnike • Moguća distrakcija usled velikog broja podataka • Zloupotreba u neakademske svrhe i razvijanje nefer prednosti • Otpor primeni VI i DA u nastavi • Zaštita tajnosti i podataka • Izbor adekvatnog modela učenja o VI i DA
PREDLOZI
• Integracija VI i digitalnih alata u nastavu predmeta MO i nastavne materijale • Tehnička podrška kroz opremu i savremene softvere na fakultetima • Kontinuirano institucionalno ažuriranje digitalnih alata i softvera • Jačanje institucionalne podrške i transparentnih procedura • Obuka i podrška nastavnicima za primenu VI u nastavi • Periodična obuka nastavnika i studenata o VI i digitalnim alatima • Razvoj jednostavnih i funkcionalnih uputstava za upotrebu • Periodično anketiranje studenata o upotrebi VI i digitalnih alata • Povezivanje nastavnog procesa, normativnih rešenja i prakse primenom VI i DA

Napomena. MO – međunarodni odnosi ; VI – veštačka inteligencija; DA – digitalni alati; SP – spoljna politika.
Izvor: Autor.

Navedena tabela ne obuhvata sve koristi, izazove i predloge, imajući u vidu dinamiku razvoja VI i DA. To je posebno uočljivo u pojavi i unapređenju postojećih platformi, što dovodi do intenzivne konkurencije u njihovom razvoju i primeni. Iako Srbija ima brojne izazove, ne sme zaostajati za ovim trendovima. Postojeća osnova u oblasti informatike predstavlja značajan potencijal, koji je potrebno dalje institucionalno razvijati i operacionalizovati. U okviru predmeta MO potrebno je integrisati VI i digitalne alate u nastavne sadržaje, udžbenike i nastavne aktivnosti, uz njihovo uspostavljanje kao standardnih nastavnih alata. Istovremeno, neophodno je sistemski organizovati obuku i kontrolu primene. Veštačka inteligencija i DA mogu biti i predmet izučavanja, ali pre svega treba da imaju ulogu alata i pomoćnog sredstva, bez ugrožavanja centralne uloge nastavnika.

Zaključak

Analiza mogućnosti primene veštačke inteligencije i digitalnih alata u nastavi međunarodnih odnosa pokazuje da ove tehnologije imaju značajan potencijal za unapređenje nastave MO, pre svega u razvoju analitičkih, interpretativnih i istraživačkih sposobnosti studenata. Istovremeno, rad je ukazao na potrebu jasnog konceptualnog razgraničenja između VI i digitalnih alata, što predstavlja preduslov za precizniju teorijsku i praktičnu analizu njihove uloge u nastavi.

Polazeći od postavljenog cilja, zaključuje se da je integraciju ovih tehnologija moguće ostvariti na efikasan i pedagoški opravdan način, pod uslovom da postoje razvijene digitalne kompetencije nastavnika, jasno definisani ishodi učenja i kritički pristup izvorima informacija. Naglašava se da primena tehnologije ne podrazumeva nekritičku upotrebu, već kontrolisanu i svrsishodnu integraciju koja ne narušava akademsku čestitost i etičke standarde. Iako VI i digitalni alati predstavljaju kvalitativnu novinu, oni ne služe kao zamena za nastavnika, već kao sredstvo koje podstiče inventivnost i omogućava dinamičniju nastavu. Uprkos prepoznatim prednostima, identifikovani su i značajni rizici – od algoritamske pristrasnosti do opasnosti od površnog usvajanja znanja – što nameće potrebu za sistemskim praćenjem njihove upotrebe.

Trenutni jaz između tehnološkog potencijala i stvarne primene u obrazovnim institucijama sugeriše da je hibridni model nastave najadekvatnije rešenje. U takvom modelu se tradicionalne metode učenja sinergijski kombinuju sa inovativnim alatima, dok uloga nastavnika ostaje centralna i neizostavna. Pronalaženje optimalnog odnosa između ovih pristupa, posebno u domenu personalizacije učenja, predstavlja ključni pravac budućih empirijskih istraživanja.

Konačno, integracija VI i digitalnih alata u nastavu MO predstavlja neminovan pravac razvoja. Njena uspešnost će suštinski zavisiti od načina na koji će biti konceptualizovani i vrednovani, uz konstantno insistiranje na etičkim kriterijumima i kvalitativnoj proceni efekata na znanje i veštine studenata.

Literatura

Anđelković, M., Grbić, D., Radosavljević, M., i Zdravković, B. (2023). Primena veštačke inteligencije u pravu, ekonomiji i menadžmentu - izazovi, pretnje i šanse sa osvrtom na Srbiju. *Godišnjak FITI, 1*(1), 85-116. https://www.fiti.edu.rs/sr/conferences-journals/antim

Bode, I. (2024). AI technologies and international relations: Do we need new analytical frameworks? *The RUSI Journal, 169*(5), 66-74. https://doi.org/10.1080/03071847.2024.2392394

Bulathwela, S., Pérez-Ortiz, M., Holloway, C., & Shawe-Taylor, J. (2021). Could AI democratise education? Socio-technical imaginaries of an EdTech revolution. In *35th Conference on Neural Information Processing Systems* (pp. 1-9). Cornell University. https://doi.org/10.48550/arXiv.2112.02034

Cardona, M. A., Rodríguez, R. J., & Ishmael, K. (2023). *Artificial intelligence and the future of teaching and learning: Insights and Reccomendations*. U.S. Department of Education, Office of Educational Technology. https://www.ed.gov/sites/ed/files/documents/ai-report/ai-report.pdf

Center for Innovation, Design, and Digital Learning. (2024). *Artificial intelligence: The impact of AI on education for all learners*. Center for Innovation, Design, and Digital Learning. https://ciddl.org/wp-content/uploads/2025/03/Artificial-Intelligence-The-Impact-of-AI-on-Education-for-All-Learners.pdf

Cvetković, K., i Opsenica-Kostić, J. (2024). Percipirana akademska kontrola, vrednost zadatka i sklonost ka digitalnoj distrakciji tokom onlajn učenja: Medijaciona uloga dosade. *Nastava i vaspitanje, 73*(1), 107-123. https://doi.org/10.5937/nasvas2401075C

Dakakni, D., & Safa, N. (2023). Artificial intelligence in the L2 classroom: Implications and challenges on ethics and equity in higher education: A 21st century Pandora's box. *Computers and Education: Artificial Intelligence, 5*, 1-10. https://doi.org/10.1016/j.caeai.2023.100179

Dimitriadou, E., & Lanitis, A. (2023). A critical evaluation, challenges, and future perspectives of using artificial intelligence and emerging technologies in smart classrooms. *Smart Learning Environments, 10*(1), 1-26. https://doi.org/10.1186/s40561-023-00231-3

Emery-Xu, N., Jordan, R., & Trager, R. (2024). International governance of advancing artificial intelligence. *AI & Society, 40*, 3019-3044. https://doi.org/10.1007/s00146-024-02050-7

Farhood, H., Nyden, M., Beheshti, A., & Muller, S. (2025). Artificial intelligence-based personalised learning in education: A systematic literature review. *Discover Artificial Intelligence, 5*, 1-41. https://doi.org/10.1007/s44163-025-00598-x

Felaco, C., Amato, F., & Aragona, B. (2024). Digital methods for social sciences. *Mathematical Population Studies, 31*(4), 237-241. https://doi.org/10.1080/08898480.2024.2414653

Hassen, M. Z. (2025). The impact of AI on students' reading, critical thinking, and problem-solving skills. *American Journal of Education and Information Technology, 9*(2), 82–90. https://doi.org/10.11648/j.ajeit.20250902.12

Kardumyan, V. (2025). The impact of artificial intelligence on international relations: Are current paradigms still relevant? *YSU Journal of International Affairs, 16*(1), 116-135. https://doi.org/10.46991/jia.2025.1.1.116

Khalifeh, F., Santiago, R., & Palau, R. (2026). Redefining personalized learning in the artificial intelligence era: An updated systematic review from 2019 to 2025. *Smart Learning Environments, 13*(1), 1-20. https://doi.org/10.1186/s40561-026-00440-6

Klein, E., & Patrick, S. (2024). *Envisioning a global regime complex to govern artificial intelligence*. Carnegie Endowment for International Peace.

Lee, J., & Park, J. (2023). AI as "Another I": Journey map of working with artificial intelligence from AI-phobia to AI-preparedness. *Organizational Dynamics, 52*(3), 100994. https://doi.org/10.1016/j.orgdyn.2023.100994

Leva, B., Onič, T., Todorović, T., Urh, J., & Hazemali, D. (2025). Student perceptions of digital tools in language and translation programs: A survey-based case study at the University of Maribor, Slovenia. *Education Sciences, 15*(9), 1119. https://doi.org/10.3390/educsci15091119

OECD. (2024). *The potential impact of artificial intelligence on equity and inclusion in education*. https://www.oecd.org/en/publications/the-potential-impact-of-artificial-intelligence-on-equity-and-inclusion-in-education_15df715b-en.html

Pešić, Z. R. (2023). *Međunarodni odnosi*. Fakultet za poslovne studije i pravo Univerziteta Union - Nikola Tesla.

Peterson, S., & Finn, D. (2024). Free and open source systems: Their value for engaging learners in online settings. *Active Learning in Higher Education, 26*(2), 413-424. https://doi.org/10.1177/14697874241257883

Polovina, N. Ž., i Dinić, T. D. (2025). Univerzitetska nastava u doba digitalizacije i veštačke inteligencije - stavovi nastavnika. *Anali Filološkog fakulteta, 37*(2), 177-194. https://doi.org/10.18485/analiff.2025.37.2.9

Rebolledo, V. G. (2025). Impact of the artificial intelligence on international relations: Towards a global algorithms governance. *UNISCI Journal, 67*, 9-51. https://doi.org/10.31439/UNISCI-219

Sağlam, R. K., & Kalanlar, B. (2025). Living with and without AI: A mixed-methods study on AI usage, addiction, and 'AIlessphobia' in nursing students. *Nurse Education in Practice, 88*, 104530. https://doi.org/10.1016/j.nepr.2025.104530

Srivastava, S., & Bullock, J. (2024). *AI, global governance, and digital sovereignty*. https://doi.org/10.48550/arXiv.2410.17481

Šović, M. V. (2025). Mišljenje nastavnika o primeni veštačke inteligencije u promeni paradigme obrazovanja. *Sinteze, 14*(27), 1-18. https://doi.org/10.5937/sinteze14-57869

Ustiashvili, S. (2025). *From textbooks to algorithms: The transformative impact of AI on teaching international relations compared to traditional classroom dynamics* [Conference presentation]. International Research Conference on Education & English Language, Tbilisi, Georgia. https://www.academia.edu/143100065/From_Textbooks_to_Algorithms_The_Transformative_Impact_of_AI_on_Teaching_International_Relations_Compared_to_Traditional_Classroom_Dynamics

Wang, F., King, R. B., Chai, C. S., & Zhou, Y. (2023). University students' intentions to learn artificial intelligence: The roles of supportive environments and expectancy–value beliefs. *International Journal of Educational Technology in Higher Education, 20*, 1-21. https://doi.org/10.1186/s41239-023-00417-2

Wu, X.Y. (2024). Artificial intelligence in L2 learning: A meta-analysis of contextual, instructional, and social-emotional moderators. *System*, *126*, 103498, 1-20. https://doi.org/10.1016/j.system.2024.103498.

Yang, S. J. H., Ogata, H., Matsui, T., & Chen, N. S. (2021). Human-centered artificial intelligence in education: Seeing the invisible through the visible. *Computers and Education: Artificial Intelligence*, *2*, 100008, 1-5. https://doi.org/10.1016/j.caeai.2021.100008

Yi, W., & Wang, S. (2025). Digital literacy education among students: Status, pathways, and implications in the current digital era. *International Journal of Education and Teaching Zone*, *4*(1), 66-85. https://doi.org/10.57092/ijetz.v4i1.385

Primljeno: 02.03.2026.
Korigovana verzija primljena: 23.04.2026.
Prihvaćeno za štampu: 12.05.2026.

Zoran Pešić
Fakultet za poslovne studije i pravo, Univerzitet Union - Nikola Tesla, Beograd, Srbija
https://orcid.org/0000-0003-3549-6897



Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Nastava i vaspitanje, 2026, *75*(2), 287-303
https://doi.org/10.5937/niv75-63543

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Obrazovanje o ublažavanju klimatskih promena i veštačka inteligencija – kritička i empirijska analiza[1]

Uroš Ćemalović[2]
Institut za evropske studije, Beograd, Srbija

Apstrakt *Veštačka inteligencija (VI) donosi niz novih pretnji i mogućnosti u brojnim kritičnim javnim sektorima, uključujući obrazovanje. Iako težnja za razvojem VI koja u centar stavlja čoveka može izgledati kao puka proklamacija, na globalnom nivou se sve veći resursi posvećuju ovom cilju. Još jedan globalno značajan problem je ublažavanje klimatskih promena; međutim, većina univerzitetskih nastavnih planova se nedovoljno bavi ovom temom, ili je potpuno prenebregava. Ovaj članak kritički istražuje rizike i potencijale VI u obrazovanju u oblasti klimatskih promena, fokusirajući se na analizu da li su i u kojoj meri alati bazirani na VI u ovoj oblasti interdisciplinarni, dostupni i uticajni. Da bi se procenila uloga VI u obrazovanju, učenju i metodama nastave (VIOUM), autor je primenio dva osnovna metodološka pristupa, postavljajući u centar naučne analize pitanja vezana za interakcije između VIOUM sistema i ljudi kao donosilaca odluka, kao i za primenljivost ovih sistema u obrazovanju o ublažavanju klimatskih promena. Prvo, sproveden je kritički pregled literature o VIOUM, sa naglaskom na njihov odnos sa različitim obrazovnim programima i metodama usmerenim na ublažavanje klimatskih promena; kada je u pitanju mesto VI u obrazovnom sistemu, recentna istraživanja su najviše kritika uputila ključnim ekonomskim i, u nešto manjoj meri, političkim razlozima koji su doveli do uvođenja novih metoda. Drugo, evaluacija uticaja VI na obrazovanje o klimatskim promenama sprovedena je kroz dva posebno koncipirana upitnika, uz korišćenje deskriptivne i deduktivne statističke metode za obradu prikupljenih podataka. Rezultati ukazuju da su obrazovni alati potpomognuti VI, a koji su specijalno prilagođeni ublažavanju klimatskih promena, značajno efikasniji u postizanju pedagoških ciljeva od opštih alata baziranih na VI, te stoga zaslužuju širu primenu u praksi. Međutim, ostaju izazovi u pogledu dostupnosti i interoperabilnosti, što trenutno ograničava njihovo šire usvajanje i istinski uticaj na kvalitet obrazovnog procesa.*

Ključne reči: *obrazovanje, ublažavanje klimatskih promena, veštačka inteligencija u obrazovanju, održivi razvoj.*

1 Ovo istraživanje je finansirano od strane Instituta za budućnost života (*the Future of Life Institute*) u okviru 2024 Grant Program (UN SDG Goals).
2 urke2626@yahoo.fr

Uvod – svrha i kontekst istraživanja

Nakon usvajanja Agende 2030 za održivi razvoj od strane država članica Ujedinjenih nacija, 17 ciljeva održivog razvoja (COR), razloženih na 169 potciljeva, postali su „zajednički nacrt za mir i prosperitet za ljude i planetu" (Ujedinjene nacije [UN], The 17 Goals, 2015). Iako su neki pripadnici naučne zajednice izrazili određene kritike u pogledu načina na koji su COR formulisani – procenjujući da su „nekonzistentni, teško merljivi, teški za primenu i praćenje" (Swain, 2018, str. 341), ali i kritikujući ih „zbog reprodukcije univerzalnog šablona zasnovanog na zapadnoj i neoliberalnoj ideologiji" (Arora-Jonsson, 2023, str. 2) – teško je poreći da COR predstavljaju dobru globalnu i univerzalno poznatu zajedničku osnovu, kako za aktivnosti vlada tako i za aktivnosti civilnog društva, kao i za dalja razmatranja u najširim stručnim i naučnim forumima.

Moto COR broj 13 (*Klimatska akcija*) glasi: „preduzeti hitne mere za borbu protiv klimatskih promena i njihovih posledica." Niko ozbiljan ne negira sve štetnije posledice klimatskih promena širom sveta, pri čemu su „klimatski rekordi […] oboreni 2023. godine [a] zajednice širom sveta trpe posledice ekstremnih vremenskih uslova, koji svakodnevno uništavaju živote i egzistencije" (UN - Progress towards the Sustainable Development Goals, 2024, str. 19). Kao jedan od tri potcilja u okviru COR 13, potcilj 13.3 (unapređenje obrazovanja, podizanje svesti i ljudskih i institucionalnih kapaciteta u vezi sa ublažavanjem klimatskih promena, prilagođavanjem, smanjenjem uticaja i ranim upozoravanjem) bavi se jednim od ključnih pitanja klimatske akcije – potrebom da se prilagodi način na koji učimo, predajemo i informišemo o ublažavanju klimatskih promena. Nažalost, rezultati postignuti u ovoj oblasti su veoma skromni. Prema najnovijem izveštaju generalnog sekretara UN, „studija iz 2023. godine koja je obuhvatila više od 530 nastavnih planova i programa za 9. razred iz prirodnih i društvenih nauka pokazala je da 69% ne sadrži nikakvu referencu na klimatske promene, a 66% ne pominje održivost" (UN - Progress towards the Sustainable Development Goals, 2024, str. 20). Ovi razočaravajući rezultati su donekle ublaženi činjenicom da je „tri četvrtine zemalja prijavilo da ima planove da revidira svoje nastavne programe u naredne tri godine kako bi se više fokusirali na klimatske promene i održivost". Međutim, ne navodi se na koji način te „tri četvrtine zemalja"nameravaju da revidiraju nastavne programe, na kojim nivoima, u kontekstu kojih predmeta i, iznad svega, uz primenu kakvih obrazovnih metoda i tehnika. Ipak, važno je napomenuti da je proces reforme nastavnih programa u ovom pravcu stidljivo pokrenut u nekim zemljama, dok je potencijal alata VI u obrazovanju o klimatskim promenama nesumnjivo istaknut u novijoj naučnoj literaturi (Allam et al., 2025; Tapalova & Zhiyenbayeva, 2022; Tarlan & Gerstlberger, 2025). Na primer, u izveštaju objavljenom 4. septembra 2024. godine, *Oxford, Cambridge and RSA Examinations* pozvao je na stvaranje nezavisnog tela koje bi održavalo „mnogo savremeniji i usmereniji ka budućnosti" nastavni program („England's school curriculum…", 2024), sa većim fokusom na klimatske promene i održivost, ali i uz insistiranje na potrebi obrazovanja o pravilnoj upotrebi VI.

Veštačka inteligencija ima nespornu sposobnost da služi kao alat za unapređenje obrazovanja, učenja i nastavnih metoda (OUM). Cilj ovog rada je da proceni specifičan uticaj veštačke inteligencije na potcilj 13.3, sa fokusom na obrazovanje o ublažavanju klimatskih promena. U tu svrhu, autor je koristio dve glavne metode. S jedne strane, istraživanje je zasnovano na kritičkom ispitivanju postojećih naučnih radova posvećenih OUM, sa posebnim osvrtom na njegovu primenljivost u različitim obrazovnim programima i metodama posvećenim ublažavanju klimatskih promena; glavni rezultati predstavljeni su u poglavlju „Stanje istraživanja…" ovog članka. S druge strane, procena budućeg potencijalnog uticaja OUM na obrazovanje o ublažavanju klimatskih promena bila je i kvalitativna i kvantitativna, zasnovana na dva prilagođena upitnika; glavni rezultati ovog aspekta istraživanja predstavljeni su u poglavljima „Rezultati i diskusija" i „Projekcije i zaključci".

Metodološki pristup

Dok je mnoštvo studija već procenilo moguće prednosti i nedostatke VI kao alata za unapređenje obrazovanja, učenja i nastavnih metoda (Alfayez & Rasool, 2025; Edam, 2024; Yuskovych-Zhukovska et al., 2022; Zawacki-Richter et al., 2019), praktično ne postoje studije koje su isključivo posvećene naučno utemeljenom i dobro dokumentovanom proučavanju uticaja OUM na ublažavanje klimatskih promena. Međutim, značajan broj novijih radova sadrži važne nalaze o upotrebi VI u nastavi i učenju o održivosti (Abulibdeh et al., 2024; Leal Filho et al., 2025), ali se takođe bavi pitanjem mesta VI u obrazovanju i praksi u oblasti životne sredine, društva i upravljanja (Correia & Água, 2024; Gupta & Agarwal, 2025; Tarlan & Gerstlberger, 2025).

Ključni element analize na koju se oslanja istraživanje predstavljeno u ovom radu je kvalitativna i kvantitativna procena uticaja VI u oblasti obrazovanja o ublažavanju klimatskih promena. Zasniva se na dva prilagođena upitnika (U1 i U2, više detalja o rezultatima ankete u poglavlju „Rezultati i diskusija") i na specifičnim alatima za obradu prikupljenih podataka, pri čemu su za obradu podataka korišćene deskriptivne i inferencijalne statističke metode. Zbog nedostatka dovoljno brojnih i detaljnih podataka objavljenih u recenziranim naučnim radovima, neki od korišćenih izvora su renomirani mediji i izveštaji međunarodnih organizacija.

Neki od ključnih kriterijuma za utvrđivanje i merenje uticaja OUM na ostvarivanje potcilja 13.3 COR bili su:

1. Nivo uključenosti obrazovnih alata zasnovanih na VI u postojeće nastavne programe visokog obrazovanja;
2. Nivo interoperabilnosti navedenih alata u prirodnim i društvenim naukama; i
3. Povratne informacije nastavnika u njihovim odgovorima na U2. Dobijeni rezultati putem anketa su detaljno analizirani i kvantfikovani.

Istraživanje se zasnivalo na dva velika izvora podataka. Ovakav pristup je bio uslovljen složenošću mogućih interakcija između OUM sistema i ljudskih donosilaca odluka (Gupta & Agarwal, 2025; Hostein & Doroudi, 2022), kao i prirodom međudejstva između automatizovanog i ljudskog donošenja odluka (Yuan et al., 2023).

Prvi skup podataka (v. poglavlje „Stanje istraživanja...") prikupljen je kritičkim ispitivanjem brojnih postojećih studija koje su već procenjivale moguće prednosti i nedostatke OUM; prikupljeni podaci su zatim analizirani kako bi se utvrdilo da li je (i, ako jeste, u kojoj meri) OUM uticao ili bi mogao da utiče na ostvarivanje potcilja 13.3.

Drugi vredan izvor podataka (vidi poglavlje „Rezultati i diskusija") prikupljen je putem dva različita, namenski kreirana upitnika (U1 i U2).

Upitnik 1, namenjen istraživačima koji su već postigli značajne rezultate u oblasti istraživanja VI, osmišljen je sa ciljem da izdvoji aspekte postojećih studija OUM koji se odnose na klimatske promene. U1 se sastoji od 16 pitanja, usmerenih na to kako VI može unaprediti obrazovanje uopšte, a posebno obrazovanje o klimatskim promenama, uključujući njenu trenutnu upotrebu, percipirani uticaj i budući potencijal. Od ispitanika se, takođe, traži da procene promene u nastavnim programima, regulatorni razvoj u vezi sa potciljem 13.3 i interoperabilnost alata VI u različitim akademskim disciplinama. Istraživači kojima su upitnici upućeni odabrani su na osnovu tri kombinovana kriterijuma: 1) nedavno (2018–2024) objavljeni radovi (poželjno u časopisima indeksiranim u WoS) ili međunarodno priznate knjige i/ili učešće u renomiranim naučnim projektima koji se odnose na upotrebu VI u obrazovanju ili na šira društvena, etička ili tehnička pitanja povezana sa OUM; 2) relativno ravnomerna geografska raspodela; 3) uključivanje istraživača iz različitih naučnih oblasti, uključujući tehničke nauke (uz razumljivu prednost društvenih nauka). Zbog ograničenog vremenskog okvira i veoma selektivnih kriterijuma, upitnik je poslat samo na adrese 14 istraživača; ovaj uzorak je relativno mali i ne omogućava dovoljnu teritorijalnu i disciplinarnu raznovrsnost, ali je obezbedio solidne povratne informacije iz dovoljno raznovrsnog spektra istraživača. Više detalja o stopi odziva, mogućim razlozima za nju, kao i tumačenju rezultata može se naći u poglavlju „Rezultati i diskusija".

Upitnik 2 (U2) poslat je predstavnicima 52 odabrane obrazovne i istraživačke institucije širom sveta i bio je usmeren na najnovije i najrelevantnije uticaje VI u obrazovanju i podizanju svesti o ublažavanju klimatskih promena. U2 se sastoji od 14 pitanja koja su ispitivala da li institucija ispitanika koristi VI u obrazovanju ili istraživanju, da li se teme povezane sa VI pojavljuju u nastavnim programima i da li se VI smatra korisnom za unapređenje nastave i učenja. Takođe se fokusira na ulogu VI u obrazovanju o ublažavanju klimatskih promena, ispitujući trenutnu upotrebu, promene u nastavnim programima, interdisciplinarnu interoperabilnost, kao i buduće prilike i rizike alata zasnovanih na VI u obrazovanju vezanom za klimu. Institucije kojima su upitnici poslati odabrane su na osnovu tri kombinovana kriterijuma:

1. Relativno ravnomerna geografska raspodela (nijedan kontinent nije zanemaren); međutim, uprkos ovom nastojanju, stopa odziva sa evropskih i azijskih univerziteta bila je nesrazmerno veća;
2. Inter- ili trans-disciplinarnost u obrazovnoj i/ili naučnoj misiji institucije; i
3. Procenjena reputacija institucije, ali nezavisno od njene izvrsnosti u oblasti obrazovnih ili istraživačkih metoda zasnovanih na VI.

Upitnik je poslat na adrese 52 institucije, a odgovorilo je tek oko polovine; ovaj uzorak, iako ograničen, omogućava dobar nivo teritorijalne i disciplinarne raznovrsnosti. Više detalja o stopi odziva, mogućim razlozima i tumačenju rezultata nalazi se u poglavlju „Rezultati i diskusija".

Ključna istraživačka pitanja koja stoje u osnovi celokupne analize i obezbeđuju komplementarnost U1 i U2 su sledeća:

1. Kada se uporede u pogledu zahteva za postizanjem obrazovnih ciljeva, koja je ključna razlika između tradicionalnih, opštih obrazovnih alata uz podršku VI i obrazovnih alata uz podršku VI prilagođenih obrazovanju o ublažavanju klimatskih promena?
2. Da li obrazovni alati uz podršku VI prilagođeni obrazovanju o ublažavanju klimatskih promena mogu postići viši stepen interdisciplinarnosti i biti prilagodljiviji složenom globalnom socio-ekonomskom kontekstu od tradicionalnih i opštih alata uz podršku VI?

Glavni alati korišćeni za obradu i predstavljanje prikupljenih podataka bili su deskriptivne i inferencijalne statističke metode, dok su četiri centralna pitanja u odnosu na koja su rezultati anketa sistematizovani (od opšteg ka specifičnom): 1) opšti stav prema VI u obrazovanju; 2) potencijal alata zasnovanih na VI u obrazovanju o ublažavanju klimatskih promena; 3) procena regulatornih promena u vezi sa sadržajem nastavnih programa; 4) prisustvo tema povezanih sa VI u nastavnim programima. Opšti rezultati (navedena pitanja 1 – 3) zasnovani su na kombinovanim rezultatima anketa (U1 i U2), dok se prisustvo tema povezanih sa VI u nastavnim programima odnosi samo na institucionalne ispitanike.

Stanje istraživanja o VI u obrazovanju i njihova primenjivost u obrazovanju o ublažavanju klimatskih promena – kritički pregled

Zaključno sa sredinom oktobra 2025. godine, a iz perspektive etičkih i drugih vrednosno relevantnih razmatranja, VI je imala najmanje kontroverzan dosadašnji učinak kada je u pitanju sposobnost da služi kao alat za unapređenje obrazovanja, učenja i nastavnih metoda. Kako su neki autori s pravom primetili, „sve empirijske studije […] predstavile su pozitivne efekte tehnika veštačke inteligencije na obrazovanje" (Zhai et al., 2021). Pored

toga, kada je u pitanju obrazovanje, kombinacija pristupa zasnovanih na znanju i onih zasnovanih na podacima predstavlja prirodan put napred (Holmes & Tuomi, 2022), uprkos značajnim kritikama koje se odnose na činjenicu da žurba u integraciji industrijski promovisanih alata veštačke inteligencije u obrazovanje nosi rizik od „epistemičke kolonizacije" (Chatzichristofis, 2026). Međutim, iako poboljšani ishodi učenja ostaju glavni razlog za usvajanje VI, neki autori ukazuju na opasnosti kolonijalizma vezanog za VI i asimetrije moći unutar i između država (Berliner, 2009; Holmes, 2020).

Najznačajnija kritika u vezi sa mestom VI u obrazovnom ekosistemu odnosi se na glavne ekonomske, a u manjoj meri i političke razloge koji su doveli do njenog uvođenja. U takvom kontekstu, kada praktično sve alate VI razvijaju i/ili obezbeđuju profitne organizacije – čiji je jedinstveni ili dominantni cilj komercijalizacija usluga na način koji maksimizuje ekonomsku dobit – potrebe učenika mogu lako biti potisnute drugim razmatranjima zasnovanim na produktivnosti, brzini i dobiti. Kako je s pravom istaknuto, „težnja ka tržišno isplativim proizvodima […] izgleda da definiše opšti pristup privatnog sektora, pre nego bilo kakvi motivi vezani za obrazovanje" (Knox, 2020, str. 16). U takvom kontekstu, pristup obrazovanju prilagođen pojedincu, zasnovan na individualnim pedagoškim potrebama učenika, ima velike šanse da bude zanemaren, a još više kada je reč o onlajn kursevima (Holstein & Doroudi, 2021; Ortagus, 2023). Stoga se poboljšani ishodi učenja pomenuti u prethodnom pasusu mogu posmatrati iz drugačijeg ugla, što omogućava dodatno preispitivanje načina na koji su mereni, posebno ako se uzme u obzir da uštede troškova usled automatizacije mogu značajno ugroziti individualni pristup u učenju. Štaviše, „veštačka inteligencija, srećom, još uvek nije u stanju da 'generiše' (ili čak imitira) inspiraciju, kontemplaciju, spontanost i žar" (Ćemalović, 2020, str. 158), osobine koje igraju važnu ulogu u obrazovnom procesu. Detaljna analiza, izrađena 2022. godine pod okriljem Saveta Evrope od strane grupe od pet autora (Wayne Holmes, Jen Persson, Irene-Angelica Chounta, Barbara Wasson i Vania Dimitrova), definisala je neke od glavnih pretnji koje VI u obrazovanju može predstavljati za ljudska prava, demokratiju i vladavinu prava. Iako je ovaj dokument najčešće ograničen na opis normativnih standarda, on takođe sadrži dobar pregled postojećih studija u ovoj oblasti; međutim, otvoreno priznaje da „postoji malo suštinske literature koja se posebno fokusira na, ili čak na značajan način pominje, veštačku inteligenciju, obrazovanje i ljudska prava" (Council of Europe, 2022, str. 51).

Primena VI u obrazovanju o ublažavanju klimatskih promena je složeno pitanje sa brojnim specifičnostima, od kojih su najvažnije njegova interdisciplinarna priroda, visoki globalni socio-ekonomski ulozi i potreba za postizanjem obrazovnih ciljeva. Prvo, interdisciplinarnost, u principu, zahteva brze analitičke alate sposobne da obrade velike količine podataka u kratkom vremenu; pored toga, značajno zavisi od spremnosti nastavnika za učenje, posebno onog koje je zasnovanog na „sveobuhvatnijem ekološkom okviru profesionalnog razvoja nastavnika" (Ehrenfeld, 2022, str. 489), što im omogućava da „uspešno integrišu alate VI uz istovremeno uvažavanje etičkih pitanja kao što su pristrasnost i zaštita podataka" (Pikhart & Al-Obaydi, 2025, str. 9). Drugo, visoki globalni socio-ekonomski ulozi

nameću potrebu za efikasnim, univerzalno primenljivim i pojednostavljenim obrazovnim alatima, sposobnim i da se suprotstave višeslojnim predrasudama, pogrešnim uverenjima i teorijama zavere o (ne)postojanju klimatskih promena, koje se stalno pojavljuju u brojnim zemljama sveta, posebno u vreme izbora ili drugih trenutaka kada se donose važne društvene odluke. Treće, zahtev za postizanjem obrazovnih ciljeva podrazumeva brze, prilagodljive i univerzalne pokretače nastavnih planova i programa (Lingard & McGregor, 2013), osmišljene tako da se lako integrišu u različite postojeće obrazovne module u osnovnim i srednjim školama, kao i u kreiranje obrazovnih politika (Linderoth et al., 2024), što posledično može dovesti do marginalizacije „vrednosti interakcija preko disciplinarnih podela" (Pasque et al., 2009, str. 126). Uzimajući u obzir sve navedene specifičnosti, može se zaključiti da obrazovni alati zasnovani na veštačkoj inteligenciji u obrazovanju o ublažavanju klimatskih promena mogu, u brojnim aspektima, biti bolje prilagođeni specifičnim pedagoškim ciljevima i potrebama učenika nego opšti obrazovni alati zasnovani na VI. Štaviše, čak ni neke relevantne kritičke primedbe u vezi sa uticajem učenja zasnovanog na VI na ljudska prava, demokratiju, vladavinu prava i privatnost (Pikhart & Al-Obaydi, 2025) nisu uvek primenljive (ili su primenljive u znatno manjoj meri) na obrazovanje podržano VI o ublažavanju klimatskih promena.

Zbog novine koju upotreba VI predstavlja u obrazovanju, ne postoji obilje nedavnih, strukturisanih, detaljnih i međunarodno sprovedenih i priznatih naučnih studija posvećenih ovom pitanju, a kamoli kada je reč o specifičnoj primeni sredstava zasnovanih na VI i tehnika u obrazovanju o ublažavanju klimatskih promena. Ipak, neke relevantne srodne studije ukazale su da je „pojavljivanje velikih jezičkih modela, demonstrirano široko dostupnim četbotovima, izazvalo značajno interesovanje za njihovu potencijalnu primenu u komunikaciji složenog naučnog znanja" (Al Khourdajie, 2025, str. 7). U sličnom duhu, uprkos sasvim razumljivim kritikama u vezi sa nedostatkom strukturisanih smernica za upotrebu VI u obrazovanju (Lane, 2025), neki autori ističu da bi njena upotreba mogla dovesti do pravednijeg, kreativnijeg i efikasnijeg okruženja za učenje (Tarlan & Gerstlberger, 2025). S druge strane, jedna nedavna studija istražila je brojne potencijalne rizike povezane sa upotrebom VI u visokom obrazovanju, naglašavajući probleme validnosti podataka, akademskog integriteta i rizika po privatnost (Pikhart & Al-Obaydi, 2025). Fenomen nastave i učenja zasnovanog na VI još uvek je relativno nov, dok primena VI u obrazovanju o ekološkim pitanjima – naročito o klimatskim promenama i njihovom ublažavanju – još uvek nije dostigla stepen razvijenosti koji bi omogućio stabilne i neupitne nalaze, a kamoli univerzalno primenljive i proverljive naučne zaključke.

Rezultati i diskusija

Ankete su sprovedene na osnovu dva odvojena, ali međusobno povezana i komplementarna upitnika. U1 je bio upućen na adrese 14 istraživača koji su već postigli značajne rezultate u ovoj oblasti (kriterijumi izbora su objašnjeni u odeljku posvećenom metodologiji), i osmišljen je sa ciljem da se utvrde glavni aspekti postojećih studija o primeni alata VI

u obrazovanju o ublažavanju klimatskih promena. Odziv anketiranih istraživača može se oceniti kao zadovoljavajući, imajući u vidu da je 12 od 14 istraživača poslalo svoje odgovore sa popunjenim upitnicima (85.7% od ukupnog broja poslatih upitnika). Jedan od glavnih razloga za takav odziv bili su, najverovatnije, lično angažovanje istraživača i njihova želja da učestvuju u naučnom istraživanju i debati, kao i da šire rezultate svog rada, ili jednostavna činjenica da je, prema nekima od njih, „uloga veštačke inteligencije obrazovanju brzo napredovala od automatizacije rutinskih administrativnih zadataka do omogućavanja visoko personalizovanog i adaptivnog iskustva učenja" (Tarlan & Gerstlberger, 2025).

U2 je poslat na adrese 52 odabrane obrazovne institucije širom sveta i bio je usmeren na najnovije i najrelevantnije uticaje VI u obrazovanju i podizanju svesti o ublažavanju klimatskih promena. Radi obezbeđivanja većeg odziva, U2 je najčešće upućivan odabranim licima u okviru obrazovnih institucija (profesorima, rukovodiocima katedri, osobama odgovornim za razvoj nastavnih programa itd.). Odziv anketiranih obrazovnih institucija može se oceniti kao umeren do nizak (27 od 52) – 51.9% od ukupnog broja poslatih U1.

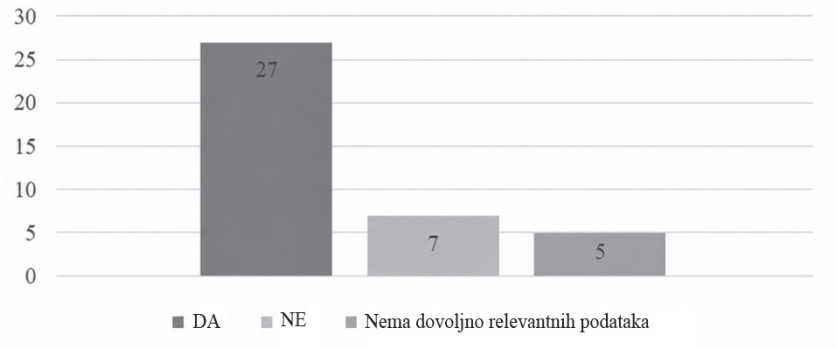
Geografska raspodela anketiranih pojedinaca i institucija bila je zamišljena kao globalna, sa ravnomernom pokrivenošću svih kontinenata. Međutim, odgovori evropskih subjekata bili su nesrazmerno veći (34% poslatih i 61% primljenih odgovora), najverovatnije usled različitih perioda akademskih raspusta, kao i blizine i/ili zajedničkih oblasti interesovanja sa istraživačem.

U1 i U2 su osmišljeni tako da omoguće prikaz kako zajedničkih (neka identična ili slična pitanja) tako i specifičnih stavova istraživača i nastavnika/predstavnika obrazovnih institucija. Ovaj pristup je omogućio razlikovanje opštih i specifičnih rezultata, dalju ekstrapolaciju, kao i primenu deskriptivnih i inferencijalnih statističkih metoda u obradi prikupljenih podataka. Pojedina pitanja, iako formulisana na sličan ili identičan način u oba upitnika (na primer, U1 – pitanja 6 i 7 i U2 – pitanja 8 i 9; U1 – pitanje 12 i U2 – pitanje 10), uvedena su kao korektivna varijabla.

Opšti rezultati anketa (zasnovani na oba upitnika) mogu se svrstati u tri glavne teme:

1. Ukupna sposobnost alata zasnovanih na VI da značajno unaprede obrazovanje, učenje i nastavne metode;
2. Stvarna primena VI u unapređenju obrazovanja o ublažavanju klimatskih promena i njen uticaj;
3. Budući potencijal alata zasnovanih na VI da značajno doprinesu obrazovanju i/ili podizanju svesti o ublažavanju klimatskih promena, adaptaciji, smanjenju uticaja i ranom upozoravanju.

Slika 1
Opšti stavovi o zastupljenosti VI u obrazovanju



Napomena. Odgovori na pitanje „Da li VI, uopšteno posmatrano, može značajno da poboljša obrazovanje, učenje i nastavne metode?"

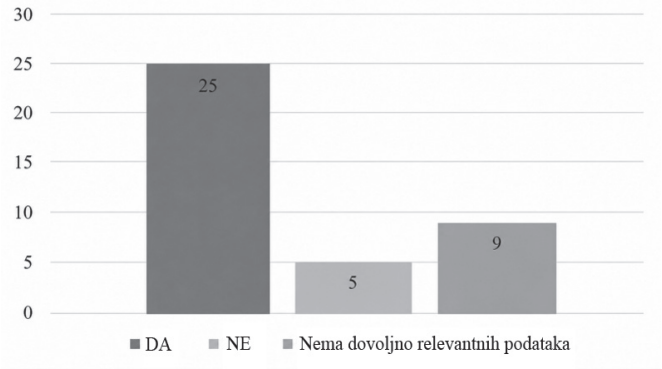
Iako nije iznenađujuće da je na pitanje formulisano u opštim (i, u izvesnoj meri, namerno nepreciznim) terminima većina (72%) anketiranih subjekata odgovorila pozitivno, važno je napomenuti da 13% istraživača i nastavnika i dalje smatra da ne postoje relevantni podaci o potencijalu VI da predstavlja prekretnicu u obrazovanju (Slika 1).

Istraživanje pokazuje značajnu neusklađenost između (iako prilično opšteg i maglovitog) poverenja da VI može unaprediti obrazovanje (67%), s jedne strane, i izostanka njene primene u obrazovanju o ublažavanju klimatskih promena (59%), s druge strane, uz značajan udeo (33%) onih koji su izjavili da ne postoje relevantni podaci. Ovakvi rezultati potvrđuju nalaze nekih ranijih istraživanja koja mesto VI u obrazovanju više definišu kao pedagošku priliku nego kao tehnokratsku pretnju (Chatzichristofis, 2026), ne diskreditujući u potpunosti kritičnije stavove koji ukazuju na višestruke rizike (Pikhart & Al-Obaydi, 2025). Međutim, od malog udela (7.7% – 3 od 39) onih koji smatraju da se VI trenutno koristi za unapređenje obrazovanja o klimatskim promenama, svi su procenili da je značajno da na unapređenje kvaliteta obrazovanja o ublažavanju klimatskih promena pozitivno utiču alati zasnovani na VI.

Iako je veoma mali broj istraživača i nastavnika procenio da se alati VI aktivno koriste u obrazovanju o ublažavanju klimatskih promena, većina njih (64%, vidi Sliku 2) veruje da će ti alati u doglednoj budućnosti dati značajan doprinos obrazovanju i/ili podizanju svesti o ovom pitanju. Ovo ukazuje na postojanje značajnog potencijala za budući razvoj prilagođenih, namenski osmišljenih, inovativnih i prilagodljivih alata zasnovanih na VI, koji bi mogli brzo odgovoriti na hitnu potrebu za postizanjem obrazovnih ciljeva i doprineti podizanju svesti o klimatskim promenama.

Slika 2

Potencijal alata zasnovanih na veštačkoj inteligenciji u obrazovanju o ublažavanju klimatskih promena



Napomena. Odgovori na pitanje „Da li verujete da će alati zasnovani na veštačkoj inteligenciji u doglednoj budućnosti značajno doprineti obrazovanju i/ili podizanju svesti o ublažavanju klimatskih promena, adaptaciji, smanjenju uticaja i ranom upozoravanju?"

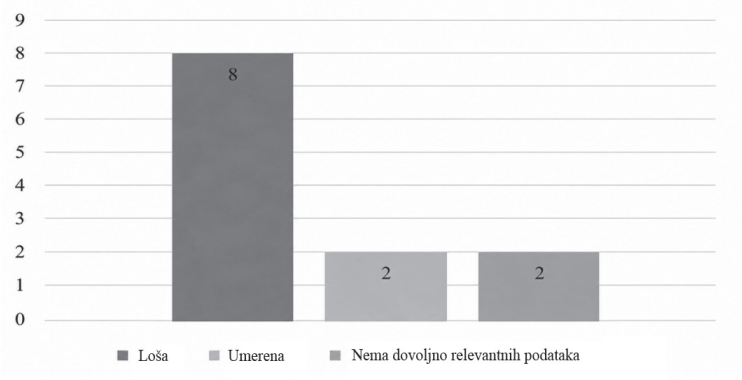
Istraživanje među istraživačima bilo je usmereno na sledeća tri glavna specifična pitanja:

1. Broj, obim, dubina i učestalost izmena nastavnih planova i programa povezanih sa upotrebom alata VI u obrazovanju o ublažavanju klimatskih promena;
2. Nivo interoperabilnosti obrazovnih alata zasnovanih na VI u oblasti ublažavanja klimatskih promena u tehničkim, prirodnim (biologija, hemija) i društvenim naukama (političke nauke, pravo, studije životne sredine) u postojećim nastavnim programima visokog obrazovanja;
3. Broj i obim predloženih, usvojenih i/ili sprovedenih nacionalnih i nadnacionalnih regulatornih promena usmerenih na unapređenje ostvarivanja potcilja održivog razvoja 13.3.

Treba napomenuti da, iako smatraju da se VI retko koristi za unapređenje obrazovanja o ublažavanju klimatskih promena, istraživači veruju da postoje izvesne izmene nastavnih planova u tom pravcu; iako broj i obim ovih izmena ostaju mali, njihova učestalost nije zanemarljiva, a još manje njihova dubina, kada se jave.

Većina istraživača procenila je da je nivo interoperabilnosti obrazovnih alata zasnovanih na VI u oblasti ublažavanja klimatskih promena umeren (42%) ili značajan (17%). Ako se to dovede u vezu, s jedne strane, sa njihovom procenom dubine i učestalosti promena nastavnih programa u ovoj oblasti, a s druge, sa vremenom potrebnim za njihovu potpunu primenu (Smeed et al., 2015) i omogućavanje „kognitivnog restrukturiranja" (Fauziah & Setyowati, 2019), može se zaključiti da obrazovni alati zasnovani na VI mogu doprineti značajnoj komplementarnosti i konvergenciji nastavnih programa posvećenih klimatskim promenama u tehničkim, prirodnim i društvenim naukama, što vodi ka pravednijem, kreativnijem i efikasnijem okruženju za učenje (Tarlan & Gerstlberger, 2025). U zaključku, ukoliko bi dosledno bilo primenjeno u većem broju nastavnih programa, unapređeno okruženje uz podršku VI moglo bi značajno doprineti pozitivnom uticaju alata VI na ostvarivanje potcilja održivog razvoja 13.3.

Slika 3
Ocena regulatornih promena



Napomena. Odgovori na pitanje „Kako biste ocenili broj i obim predloženih, usvojenih i/ili sprovedenih nacionalnih i nadnacionalnih regulatornih promena usmerenih na unapređenje ostvarivanja potcilja održivog razvoja 13.3?

Konačno, u pitanju koje je bilo isključivo posvećeno njima (v. Sliku 3), od istraživača je zatraženo da daju svoju procenu u vezi sa nacionalnim i nadnacionalnim regulatornim promenama usmerenim na unapređenje obrazovanja, podizanja svesti i ljudskih i institucionalnih kapaciteta u oblasti ublažavanja klimatskih promena, adaptacije, smanjenja uticaja i ranog upozoravanja. Kao jedno od retkih pitanja u U1, koje nije direktno povezano sa pitanjima veštačke inteligencije, ono je služilo i kao kontrolna varijabla i kao način za poređenje rezultata u nastavnim i regulatornim promenama. Važno je napomenuti da je samo relativno mali deo anketiranih lica stručan u oblasti pravnih ili političkih nauka, ali – za razliku od njihovih odgovora na druga pitanja – niko od njih nije naveo nedostatak relevantnih podataka, verovatno zbog činjenice da nastavnici imaju tendenciju da veruju da nastavnička autonomija može usmeravati VI (Chatzichristofis, 2026). Odgovori učesnika na ovo pitanje ukazali su na značajan nalaz: istraživači često smatraju da su bolje informisani o onome što se radi na nacionalnom i nadnacionalnom regulatornom nivou nego o onome što se dešava u samom obrazovnom okruženju.

Istraživanje među nastavnicima/predstavnicima obrazovnih institucija bilo je usmereno na sledeća tri glavna specifična pitanja:

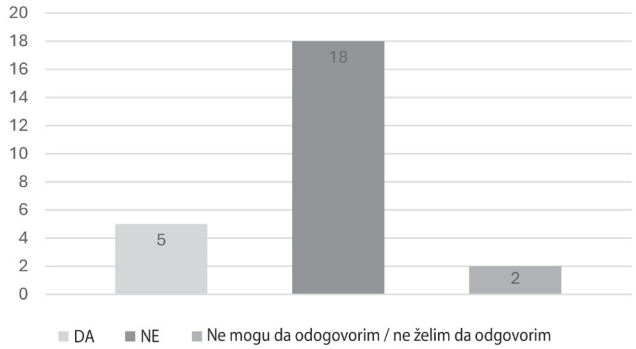
1. Upotreba alata zasnovanih na VI u obrazovnim i/ili istraživačkim aktivnostima;
2. Prisustvo tema povezanih sa VI u nastavnim planovima i programima i/ili institucionalnim obrazovnim/istraživačkim ciljevima;
3. Broj i obim izmena nastavnih planova i programa povezanih sa upotrebom alata VI u obrazovanju.

Upotreba VI u obrazovnim i/ili istraživačkim aktivnostima i dalje nije široko rasprostranjena (33%) u obrazovnim institucijama, kako na osnovnim tako i na postdiplomskim

studijama. Međutim, zanimljivo je napomenuti da – čak i u okviru sopstvene institucije – nastavnici često nisu svesni (15%) da li njihove kolege u drugim odeljenjima/jedinicama koriste neke alate zasnovane na VI, a još manje na koji način se ti alati koriste. Ovo pokazuje da je VI – barem na globalnom nivou – još uvek novina u obrazovnom okruženju, kao što je već navedeno u literaturi, posebno kada je reč o strukturisanim smernicama za nastavnike (Lane, 2025).

Slika 4

Prisustvo tema povezanih sa veštačkom inteligencijom u nastavnim programima



Napomena. Odgovori na pitanje „Da li su teme povezane sa veštačkom inteligencijom prisutne u vašim nastavnim programima i/ili institucionalnim obrazovnim/istra živačkim ciljevima?

Rezultati su bili još upečatljiviji kada su nastavnici upitani o prisustvu tema povezanih sa VI u nastavnim programima i/ili institucionalnim obrazovnim/istraživačkim ciljevima njihove institucije (v. Sliku 4). Ogromna većina (74%) odgovorila je negativno, dok su oni koji su naveli da VI – na transparentan i formalno utvrđen način – ima svoje mesto u njihovim nastavnim programima i/ili među institucionalnim obrazovnim/istraživačkim ciljevima najverovatnije profesori koji su i sami osmislili te programe i trenutno predaju po njima.

Iako su gotovo podjednako pesimistični kao i istraživači u pogledu broja izmena nastavnih programa povezanih sa upotrebom alata VI u obrazovanju, odgovori nastavnika se značajno razlikuju u pogledu obima tih izmena, pri čemu 55% njih procenjuje da su one značajne (42%) ili umerene (13%). To, najverovatnije, dovodi do ključnog uvida ovog dela istraživanja: kada se jednom sprovedu izmene nastavnih programa u vezi sa upotrebom alata VI u obrazovanju o klimatskim promenama, njihov obim je najčešće značajan, što je nalaz potvrđen i u nedavnoj sistemskoj analizi literature (Tarlan & Gerstlberger, 2025). Kada se ovo dovede u vezu sa već iznetim tvrdnjama, može se zaključiti da obrazovni alati zasnovani na VI imaju značajan potencijal da doprinesu ostvarivanju potcilja održivog razvoja 13.3.

Zaključci i projekcije

Na osnovu kombinovanih i ekstrapoliranih nalaza iz anketa, kao i analiza istraživanja o VI u obrazovanju i njenoj ulozi u ublažavanju klimatskih promena, izvedeno je nekoliko ključnih zaključaka i projekcija (vidi Tabelu 1), sa fokusom na to kako se različiti tipovi kurikuluma usklađuju sa specifičnim potrebama obrazovanja o ublažavanju klimatskih promena.

Tabela 1
Kako različiti tipovi kurikuluma odgovaraju specifičnim potrebama obrazovanja o ublažavanju klimatskih promena

Specifične potrebe/ odlike obrazovanja o klimatskim promenama	Tradicionalni kurikulumi (bez podrške VI)	Opšti obrazovni alati uz podršku VI	Obrazovni alati uz podršku veštačke inteligencije prilagođeni obrazovanju o klimatskim promenama
Međudisciplinarnost	Od niske do umerene - često insistiraju na strogoj podeli između prirodnih i društvenih nauka - sporo se prilagođavaju međudisciplinarnim pitanjima povezanim sa održivošću	Umerene - češće integrišu međusektorska pitanja - češće uključuju interaktivne obrazovne alate	Umerena do visoka - sposobni da prikažu složenost pitanja povezanih sa održivošću - uvek uključuju interaktivne obrazovne alate
Visoki globalni socio-ekonomski ulozi	Slaba prilagodljivost - uglavnom spori i neefikasni u suzbijanju predrasuda, zabluda i teorija zavere o klimatskim promenama - ne reaguju na nove kanale informisanja i komunikacije	Prilagodljivi, uz visoke rizike - prilagodljivi brzim društvenim promenama i dinamičnom okruženju - mogu se lako koristiti u obmanjujuće i manipulativne svrhe	Visoko prilagodljivi - sposobni da prikažu društvene uticaje klimatskih promena - efikasni u suzbijanju predrasuda, zabluda i teorija zavere - reaguju na nove kanale informisanja i komunikacije
Brzina postizanja obrazovnih ciljeva	Uglavnom spori - najčešće osmišljeni za postizanje složenih obrazovnih ciljeva - usmereni na dugoročne pedagoške ciljeve	Potencijalno brzi, uz rizike - mogu doneti brze rezultate, uz upitnu održivost - mogu biti podložni manipulaciji	Brzi - sposobni da pruže sažetu i prilagođenu obuku - efikasni u podizanju svesti i podsticanju ekološkog aktivizma

Alati zasnovani na VI mogu značajno unaprediti obrazovanje, učenje i nastavu o ublažavanju klimatskih promena, ali se i dalje relativno retko koriste. Izmene u nastavnim programima povezane sa upotrebom alata VI u ovoj oblasti obrazovanja ostaju ograničene po broju i obimu; ipak, njihova sve veća dubina i učestalost ukazuju na verovatno širenje alata i praksi zasnovanih na VI u nastavnim programima vezanim za ublažavanje klimatskih promena. Istovremeno, predložene i sprovedene nacionalne i nadnacionalne regulatorne promene usmerene na postizanje potcilja održivog razvoja 13.3 i dalje su nedovoljne; dugotrajni proces usvajanja Akta Evropske unije o veštačkoj inteligenciji (Pravilnik EU 2024/1689), zajedno sa njegovim ograničenim dometom, najverovatnije će rezultirati ograničenim efektima i mogućim izazovima u primeni u državama članicama EU.

U prirodnim naukama (kao što su biologija i hemija) i društvenim naukama (uključujući političke nauke, pravo i studije životne sredine), očekuje se da će rasti interoperabilnost obrazovnih alata u segmentu povezanom sa ublažavanjem klimatskih promena, čime će se ojačati održivost pedagoških ciljeva. Uzimajući u obzir specifične potrebe i karakteristike obrazovanja – kao što su međudisciplinarnost i visoki globalni socio-ekonomski ulozi u postizanju obrazovnih ciljeva – verovatnije je da će alati zasnovani na VI prilagođeni obrazovanju o ublažavanju klimatskih promena postići pedagošku efikasnost nego opšti alati ovog tipa. Ovaj zaključak se, pre svega, nameće zbog njihove sposobnosti da bolje prikažu složenost pitanja održivosti, obuhvate društvene uticaje klimatskih promena, suprotstave se dezinformacijama i zabludama i prilagode se promenljivim kanalima komunikacije. Pored toga, oni su efikasniji u pružanju sažetog, prilagođenog učenja i delotvorniji u podizanju svesti i podsticanju ekološkog angažovanja.

U celini, kada se procenjuju prema sposobnosti da ostvare obrazovne ciljeve, tradicionalni nastavni programi (bez podrške VI) obično su sporiji zbog naglaska na dugoročnim pedagoškim ishodima. Opšti alati VI mogu doneti brze obrazovne rezultate, ali uz neizvesnu održivost, dok su alati prilagođeni obrazovanju o ublažavanju klimatskih promena, uprkos izvesnim strukturnim rizicima, bolje prilagođeni da obezbede ciljano, efikasno i uticajno učenje, istovremeno unapređujući međudisciplinarnost i prilagodljivost složenim globalnim socio-ekonomskim kontekstima.

Literatura

Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production, 437*. https://doi.org/10.1016/j.jclepro.2023.140527

Alfayez, A. A., & Rasool, A. (2025). Use of AI in the Curriculum Development of Transnational Higher Education. In F. Naseer, C. Yu, R. Dulloo, M. Abdul Kader Jilani, & M. Shaheen (Eds.), *Bridging Global Divides for Transnational Higher Education in the AI Era*, (pp. 401-422). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-7016-2.ch019

Allam, H. M., Gyamfi, B., & AlOmar, B. (2025). Sustainable Innovation: Harnessing AI and Living Intelligence to Transform Higher Education. *Education Sciences, 15*(4), 398. https://doi.org/10.3390/educsci15040398

Al Khourdajie, A. (2025). The role of artificial intelligence in climate change scientific assessments. *PLOS Climate, 4*(9), 1-14. https://doi.org/10.1371/journal.pclm.0000706

Arora-Jonsson, S. (2023). The sustainable development goals: A universalist promise for the future. *Futures, 146*. https://doi.org/10.1016/j.futures.2022.103087

Berliner, D. C. (2009). MCLB (Much Curriculum Left Behind): A U.S. Calamity in the Making. *The Educational Forum, 73*(4), 284–296. https://doi.org/10.1080/00131720903166788

Ćemalović, U. (2020). Creativity and ownership: Protection of rights in musical works in the European Union from digitisation to artificial intelligence. *Musicology, 29*, 149-162. https://doi.org/10.2298/MUZ2029149C

Chatzichristofis, S. A. (2026). Reframing AI in Education: A Pedagogical Opportunity, Not a Technocratic Threat. *Journal of Research in Science Teaching, 63(*1), 97-103. https://doi.org/10.1002/tea.70024

Correia A. & Água P. (2024). Harnessing artificial intelligence for enhanced environmental, social, and governance reporting: A new paradigm in corporate transparency. In Ž. Stankevičiūtė, A. Kostyuk, M. Venuti , & P. Ulrich (Eds.), *Corporate Governance: Research and Advanced Practices* (pp. 92-98). Virtus Interpress. https://doi.org/10.22495/cgrapp15

Council of Europe. (2022). *Artificial intelligence and education: A critical view through the lens of human rights, democracy and the rule of law* (W. Holmes, J. Persson, I. A. Chounta, B. Wasson, & V. Dimitrova (Eds.). https://www.developmentaid.org/api/frontend/cms/file/2022/11/Artificial-Intelligence-and-education_eng.pdf

Edam, S. M. (2024). AI in Educational Design and Technological Development. In Z. Ahmed, A. Hassan, & R. Saeed (Eds.), *AI-Enhanced Teaching Methods* (pp. 25-60). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-2728-9.ch002

Ehrenfeld, N. (2022). Framing an Ecological Perspective on Teacher Professional Development. *Educational Researcher, 51*(7), 489–495. https://doi.org/10.3102/0013189X221112113

England's school curriculum needs reform to fix "glaring omissions," review finds. (n.d.). Financial Times. https://www.ft.com/content/7b0fe220-32ed-43b3-8178-01751aa5730f

Fauziah, M., & Aprilia Setyowati, A. (2019). Cognitive restructuring techniques to improve student self-concept. *Advances in Social Science, Education and Humanities Research, 387,* 3rd International Conference on Education Innovation (ICEI 2019).

Gupta, S., & Agarwal, S. (2025). Applications of machine learning and artificial intelligence in Environmental, Social and Governance (ESG) sector. *Proceedings of the 3rd International Conference on Optimization Techniques in the Field of Engineering (ICOFE-2024)*.

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education Research, Development and Policy, 57*(4), 542–570. https://doi.org/10.1111/ejed.12533

Holstein, K., & Doroudi, S. (2021). Equity and artificial intelligence in education: Will "AIEd" amplify or alleviate inequities in education? https://doi.org/10.48550/arXiv.2104.12920

International Association of Privacy Professionals. (2024). *Global AI law and policy tracker*. https://iapp.org/media/pdf/resource_center/global_ai_law_policy_tracker.pdf

Lane, R. (2025). Mitigating risks, embracing potential: a framework for integrating generative artificial intelligence in geographical and environmental education. *International Research in Geographical and Environmental Education*, 1-18. https://doi.org/10.1080/10382046.2025.2458561

Leal Filho, W., Kim, E., Borsatto et al. (2025). Using artificial intelligence in sustainability teaching and learning. *Environmental Sciences Europe, 37*, 124. https://doi.org/10.1186/s12302-025-01159-w

Linderoth, C., Hultén, M., & Stenliden, L. (2024). Competing visions of artificial intelligence in education—A heuristic analysis on sociotechnical imaginaries and problematizations in policy guidelines. *Policy Futures in Education*, *22*(8), 1662-1678. https://doi.org/10.1177/14782103241228900

Lingard, B., & McGregor, G. (2013). High-stakes assessment and new curricula: A Queensland case of competing tensions in curriculum development. In M. Priestley & G. Biesta (Eds.), *Reinventing the curriculum: New trends in curriculum policy and practice* (pp. 207–228). Bloomsbury Academic.

OCR. (2024). *Striking the balance*. Cambridge University Press & Assessment. https://teach.ocr.org.uk/striking-the-balance

Ortagus, J. (2023). The relationship between varying levels of online enrolment and degree completion. *Educational Researcher, 52*(3), 170–173. https://doi.org/10.3102/0013189X221147522

Pasque, P. A., Bowman, N. A., & Martinez, M. (Eds.). (2009). *Critical issues in higher education for the public good: Qualitative, quantitative & historical research perspectives*. Kennesaw State University Press.

Pikhart, M. & Al-Obaydi L. (2025). Reporting the potential risk of using AI in higher Education: Subjective perspectives of educators*, Computers in Human Behavior Reports, 18*. https://doi.org/10.1016/j.chbr.2025.100693

Smeed, J., Bourke, T., Nickerson, J., & Corsbie, T. (2015). Testing Times for the Implementation of Curriculum Change: Analysis and Extension of a Curriculum Change Model: Analysis and Extension of a Curriculum Change Model. *Sage Open*, *5*(2), 1-14. https://doi.org/10.1177/2158244015581018

Swain, R. B. (2018). A critical analysis of the sustainable development goals. In W. L. Filho (Ed.), *Handbook of sustainability science and research* (pp. 341–355). Springer.

Tapalova, O. & Zhiyenbayeva, N. (2022). Artificial Intelligence in education: AIEd for personalised learning pathways. *Electronic Journal of e-Learning, 20*, 639–653. https://doi.org/10.34190/ejel.20.5.2597

Tarlan, A., & Gerstlberger, W. (2025). AI for ESG Education: Mapping Innovations, Challenges, and Future Directions. In *Artificial Intelligence in Education - Creating an Equitable, Creative, and Effective Learning Environment*. https://doi.org/10.5772/intechopen.1012985

United Nations. (2015). *The 17 goals*. https://sdgs.un.org/goals

United Nations. (2024). *Report of the Secretary-General: Progress towards the Sustainable Development Goals* (submitted on May 2, 2024). https://unstats.un.org/sdgs/files/report/2024/SG-SDG-Progress-Report-2024-advanced-unedited-version.pdf

Yuan, X., Bennett Gayle, D., Knight, T., & Dubois, E. (2023). Adoption of artificial intelligence technologies by often marginalized populations. In X. Yuan, D. Wu, & D. Bennett Gayle (Eds.), *Social vulnerability*

to COVID-19 (Synthesis Lectures on Information Concepts, Retrieval, and Services) (pp. 31-49). Springer. https://doi.org/10.1007/978-3-031-06897-3_3

Yuskovykh-Zhukovska, V., Poplavska, T., Diachenko, O., Mishenina, T., Topolnyk, Y., & Gurevych, R. (2022). Application of artificial intelligence in education: Problems and opportunities for sustainable development. *BRAIN: Broad Research in Artificial Intelligence and Neuroscience, 13*(1 Suppl. 1), 339–356. https://brain.edusoft.ro/index.php/brain/article/view/1272

Zawacki-Richter, O., Marín, V.I., Bond, M. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators?. *Int Journal of Educational Technology in Higher Education, 16*(39). 1-27. https://doi.org/10.1186/s41239-019-0171-0

Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., Liu, J.-B., Yuan, J., & Li, Y. (2021). A review of artificial intelligence (AI) in education from 2010 to 2020. *Complexity, 2021*(1). 1-18. https://doi.org/10.1155/2021/8812542

Primljeno: 16.12.2025.
Korigovana verzija primljena: 08.06.2026.
Prihvaćeno za štampu: 11.06.2026.

Uroš Ćemalović
Institut za evropske studije, Beograd, Srbija
https://orcid.org/0000-0002-0760-9703

Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Nastava i vaspitanje, 2026, *75*(2), 305-324
https://doi.org/10.5937/niv75-62646

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Lične i školske karakteristike kao prediktori sindroma sagorevanja nastavnika u Srbiji

Stanislava Marić Jurišin
Odsek za pedagogiju, Filozofski fakultet,
Univerzitet u Novom Sadu, Novi Sad, Srbija
Borka Malčić
Odsek za pedagogiju, Filozofski fakultet,
Univerzitet u Novom Sadu, Novi Sad, Srbija
Snežana Jokić
Tehnički fakultet, Univerzitet u Novom Sadu, Zrenjanin, Srbija
Simona Bekić[1]
Odsek za pedagogiju, Filozofski fakultet,
Univerzitet u Novom Sadu, Novi Sad, Srbija

Apstrakt *Dosadašnja istraživanja ukazuju na zabrinjavajuće visok udeo nastavnika koji ispoljavaju simptome sindroma sagorevanja na globalnom nivou. Posledice ovog fenomena prevazilaze individualni nivo, jer narušavaju kvalitet nastavnog procesa, umanjuju motivaciju i psihološko blagostanje nastavnika i mogu negativno uticati na razvoj učenika. Zbog toga je cilj ovog istraživanja bio da ispita kako lični i školski faktori doprinose razvoju sindroma sagorevanja nastavnika u Srbiji. Na uzorku od 883 nastavnika osnovnih i srednjih škola širom Srbije, sprovedeno je istraživanje korišćenjem instrumenta Maslach Burnout Inventory – Educators Survey (MBI-ES), kao i i skupa ličnih varijabli i varijabli vezanih za radno mesto. Rezultati su pokazali umereno visok nivo emocionalne iscrpljenosti, nizak do umeren nivo depersonalizacije i visok nivo ličnog postignuća. Višestrukom regresionom analizom identifikovani su značajni prediktori dimenzija sagorevanja: radni staž, materijalni status, uzrast, tip škole i predmetna oblast za emocionalnu iscrpljenost; oblast studija za lično postignuće; te radni staž, uzrast i materijalni status za depersonalizaciju. Ovi nalazi ukazuju da se sagorevanje dešava ne samo pod uticajem individualnih faktora već i usled širih organizacionih i sistemskih uslova. Rezultati ovog istraživanja mogu poslužiti kao osnova za kreiranje strategija prevencije sagorevanja nastavnika u Srbiji i sličnim obrazovnim kontekstima. U radu se razmatraju i ograničenja, kao i smernice za buduća istraživanja.*

Ključne reči: *nastavnici, sagorevanje nastavnika, školsko okruženje, MBI-ES.*

1 simona.bekic@ff.uns.ac.rs

Uvod

Sindrom sagorevanja se najčešće definiše kao stanje emocionalne iscrpljenosti i smanjenog osećaja ličnog postignuća, koje nastaje kao odgovor na dugotrajni stres povezan sa radnim okruženjem pojedinca (Schaufeli & Buunk, 2003). Iako postoji više različitih konceptualizacija, ova pojava se najčešće određuje kroz tri dimenzije: emocionalnu iscrpljenost (EE), depersonalizaciju, odnosno, distanciranje od posla i ljudi uključenih u njega (DP) i osećaj smanjenog ličnog postignuća (PA) (Maslach et al., 2016). Različiti sociološki, ekonomski, politički i faktori sredine doprineli su porastu učestalosti sindroma sagorevanja u 21. veku. Istraživanja pokazuju da su uzroci i simptomi sindroma sagorevanja slični u različitim profesionalnim kontekstima (Marek et al., 2017; Schaufeli et al., 2009), ali studije ukazuju da je ova pojava izraženija u profesijama koje podrazumevaju rad sa ljudima, kao što su zdravstvo i obrazovanje (Durr et al., 2014).

U Srbiji, dosadašnji rezultati ukazuju na zabrinjavajuće visok nivo sagorevanja među nastavnicima (Marić i sar., 2024; Ranđelović i sar., 2013). Nastavnici su posebno podložni ovom fenomenu zbog prirode svog posla, koji podrazumeva visoke emocionalne zahteve, rad pod pritiskom i često neadekvatne uslove rada (Marić-Jurišin i Malčić, 2022; Popović i sar., 2023). Proučavanje ovog fenomena je od globalnog značaja, naročito s obzirom na njegove brojne negativne posledice: ugrožavanje zdravlja, narušavanje obrazovnog procesa, negativne uticaje na psihički i emocionalni razvoj dece (Marić i sar., 2024; Ranđelović i sar., 2013), kao i na smanjenje nastavničke efikasnosti, motivacije, samopouzdanja, samopoštovanja, produktivnosti i zadovoljstva poslom (Herman et al., 2018; Marek et al., 2017; Skaalvik & Skaalvik, 2014). Brojna psihološka i pedagoška istraživanja bavila su se sagorevanjem nastavnika (Buonomo et al., 2017; Chang, 2013; Kim & Burić, 2020; Ranđelović i sar., 2013). Međutim, mali broj studija je ispitivao uticaj složene interakcije između individualnih karakteristika i radnog okruženja na pojavu sagorevanja kod nastavnika. Zbog toga je cilj ovog istraživanja da analizira odnose između ličnih i školskih faktora i način na koji oni doprinose objašnjenju sindroma sagorevanja nastavnika u Srbiji. Dobijeni nalazi mogu imati značaj, ne samo za intervencije na nivou škole već i za kreiranje obrazovnih politika u Srbiji i sličnim kontekstima.

Prediktori sagorevanja nastavnika

Iako su pripadnici svih profesija podložni razvoju sindroma sagorevanja, on je naročito izražen među nastavnicima. Procenjuje se da sagorevanje pogađa čak 70% nastavnika tokom njihove profesionalne karijere (Piperac et al., 2021). Ovi zabrinjavajući podaci otvaraju pitanje uzroka ovakvog stanja. Postojeća literatura naglašava multifaktorsku prirodu sagorevanja kod nastavnika, koje se može objasniti kroz lične prediktore i prediktore vezane za radno okruženje.

Među ličnim karakteristikama se često izdvaja uzrast kao značajan faktor, ali rezultati nisu ujednačeni. Neka istraživanja ukazuju da je sagorevanje češće kod mlađih nastavnika (Al Asadi et al., 2018; Zhang, 2022), dok druga pokazuju više nivoe

kod starijih nastavnika (Aflakseir & Nemati, 2018; Padmanabhanunni & Pretorius, 2023; Schaufeli & Buunk, 2003). Slične nedoslednosti javljaju se i u odnosu na pol. Neke studije ukazuju na viši nivo sagorevanja kod žena (Zhang et al., 2014), dok druge pokazuju veću zastupljenost kod muškaraca (Al Asadi et al., 2018; Unterbrink et al., 2007). U finskim istraživanjima utvrđeno je da muškarci ispoljavaju viši nivo depersonalizacije, dok žene prijavljuju veću emocionalnu iscrpljenost (Saloviita & Pakarinen, 2021). Jedna meta-analiza (Yorulmaz & Altınkurt, 2018) ukazuje da je nivo obrazovanja takođe značajan faktor. Nastavnici sa višim stepenom obrazovanja pokazuju viši nivo sagorevanja i niži osećaj ličnog postignuća. Radni staž je takođe povezan sa sagorevanjem, ali rezultati variraju. Neka istraživanja ukazuju na veće sagorevanje kod iskusnijih nastavnika, dok druga pokazuju suprotan trend. Niži materijalni status povezan je sa višim nivoom sagorevanja (Candeias et al., 2020). Ove razlike mogu delimično biti posledica kulturoloških specifičnosti i specifičnosti obrazovnog konteksta, koje se često ne uzimaju u obzir u dovoljnoj meri tokom kvantitativnih istraživanja.

Kada je reč o karakteristikama radnog okruženja, istraživanja ukazuju na razlike između različitih nivoa obrazovanja. Dok neka istraživanja ne nalaze značajne razlike između nastavnika u osnovnim i srednjim školama (Rajendran et al., 2020), druga pokazuju da nastavnici na nižim nivoima obrazovanja imaju veći rizik od sagorevanja u okviru svih dimenzija (Kimsesiz, 2019). Razlike su uočene i između tipova škola. Na primer, nastavnici u stručnim školama pokazuju viši nivo sagorevanja u odnosu na nastavnike u gimnazijama, delom zbog nižeg osećaja nagrađenosti i profesionalnog statusa (Unterbrink et al., 2007). Takođe, uočene su razlike između nastavnika različitih predmetnih oblasti (npr. društvene nauke u odnosu na „STEM" oblasti (nauka, tehnologija, inženjerstvo i matematika)) (Agyapong et al., 2022; Saloviita & Pakarinen, 2021).

Cilj istraživanja i hipoteze

Cilj ovog istraživanja je da utvrdi i analizira složene odnose između ličnih karakteristika, karakteristika radnog mesta nastavnika i načina na koji one doprinose objašnjenju sindroma sagorevanja nastavnika u Srbiji. Na osnovu pregleda literature i specifičnosti konteksta, formulisane su sledeće hipoteze. H_0: *Ne postoji značajna povezanost između ličnih i profesionalnih karakteristika i nivoa sagorevanja nastavnika*. H_1: *Postoji značajna povezanost između ličnih karakteristika, radnog okruženja i nivoa sagorevanja nastavnika*. Specifične hipoteze su:

X1: Nastavnici sa dužim radnim stažom imaju viši nivo sagorevanja.

X2: Nastavnici sa lošijim materijalnim statusom imaju viši nivo sagorevanja.

X3: Stariji nastavnici imaju niži nivo sagorevanja u odnosu na mlađe nastavnike.

X4: Postoje razlike u nivou sagorevanja u zavisnosti od tipa škole.

X4.1: Nastavnici u osnovnim školama imaju viši nivo sagorevanja u odnosu na nastavnike u srednjim školama.

X4.2: Nastavnici u prvom ciklusu osnovne škole imaju viši nivo sagorevanja u odnosu na nastavnike u drugom ciklusu.

X5: Nastavnici društvenih, umetničkih i praktičnih predmeta imaju niži nivo sagorevanja u odnosu na nastavnike predmeta iz oblasti prirodnih nauka.

X6: Odeljenjsko starešinstvo je povezano sa višim nivoom sagorevanja.

X7: Pol i nivo obrazovanja nisu značajni prediktori sagorevanja.

Metod

Kontekst istraživanja

Istraživanje je sprovedeno u Srbiji, gde je osnovno obrazovanje osmogodišnje, a sastoji se iz dva obrazovna ciklusa: prvog ciklusa (od 1. do 4. razreda), u kome nastavu izvode učitelji, i drugog ciklusa (od 5. do 8. razreda), koji se zasniva na predmetnoj nastavi, odnosno, nastavi koju realizuju različiti nastavnici za pojedinačne predmete. Javno osnovno obrazovanje je obavezno i besplatno (Eurydice, 2025), nakon čega učenici mogu nastaviti školovanje u četvorogodišnjim gimnazijama ili srednjim stručnim školama. Putevi inicijalnog obrazovanja nastavnika razlikuju se u zavisnosti od nastavničke uloge. Učitelji se obrazuju na učiteljskim fakultetima kroz programe usmerene na pedagogiju, didaktiku i praktičnu nastavu, najčešće kroz četvorogodišnje osnovne studije, nakon čega sledi jednogodišnji master program. Predmetni nastavnici, koji predaju u višim razredima osnovne škole i u srednjim školama, obrazuju se pre svega na fakultetima odgovarajućih naučnih oblasti, nakon čega stiču pedagoško-psihološko-didaktičke kompetencije. Od 2013. godine postoji i alternativni put, koji omogućava diplomcima nenastavničkih studijskih programa da steknu master iz oblasti obrazovanja i uđu u nastavničku profesiju (Maghnouj et al., 2020). Iako je formalno propisano da svi nastavnici moraju imati master diplomu, varijabla „nivo obrazovanja" u ovom istraživanju odražava razlike u stečenim akademskim stepenima i obrazovnim putanjama, a ne formalnu podobnost za rad.

Ove razlike u pripremi nastavnika mogu dovesti do različitih profesionalnih iskustava. Učitelji su više usmereni ka holističkom razvoju deteta i dugoročnim odnosima sa učenicima, dok predmetni nastavnici stavljaju veći akcenat na predmetno znanje i nastavu specifičnog predmeta (Maghnouj et al., 2020). Istovremeno, obrazovni sistem u Srbiji suočava se sa brojnim strukturnim izazovima. Javna ulaganja u obrazovanje relativno su niska (oko 4% BDP-a), što je ispod proseka OECD-a, a nedovoljno finansiranje je posebno izraženo u srednjem obrazovanju (Maghnouj et al., 2020). Nastavnički kadar stari, većinski je ženskog pola i često je obeležen tradicionalnim pedagoškim pristupima koji zaostaju za savremenim modelima nastave sa učenikom u centru obrazovno-vaspitnih aktivnosti. Plate nastavnika su relativno niske, dok su mogućnosti napredovanja ograničene složenim procedurama i slabim finansijskim podsticajima. Stručno usavršavanje se uglavnom finansira na lokalnom nivou i često zavisi od spoljnih izvora ili ličnih ulaganja nastavnika, usled nestabilnog centralnog finansiranja i ograničenih budžeta lokalnih samouprava (Eurydice, 2025; Maghnouj et al., 2020).

Uzorak

Struktura uzorka prikazana je u Tabeli 1. Tokom realizacije istraživanja, autori su se pridržavali Kodeksa akademskog integriteta Univerziteta u Novom Sadu, posebno člana 7, koji se odnosi na „naučnoistraživački rad sa ispitanicima" (Univerzitet u Novom Sadu, 2020). Učesnici su bili informisani o etičkim procedurama i učestvovali su dobrovoljno.

Tabela 1
Struktura uzorka (N = 883)

Varijabla	Nivo	Broj	Procenat
Pol	Muški	132	14.9
	Ženski	751	85.1
Starosna grupa	24-30	55	6.2
	31-40	183	20.7
	41-50	320	36.2
	51-60	264	29.9
	61+	61	6.9
Radni staž	1-5	91	10.3
	6-15	219	24.8
	16-25	304	34.4
	25+	269	30.5
Nivo obrazovanja	Osnovne studije	405	45.9
	Master studije	442	50.1
	Specijalističke studije	26	2.9
	Doktorske studije	10	1.1
Ekonomski status	Isto kao i većina	588	66.6
	Lošije od većine	234	26.5
	Bolje od većine	61	6.9
Okruženje škole	Urbano	568	64.3
	Ruralno	315	35.7
Tip škole	Osnovna škola – prvi ciklus	246	27.9
	Osnovna škola – drugi ciklus	375	42.5
	Srednja stručna škola	164	18.6
	Gimnazija	77	8.7
	Srednja umetnička škola	21	2.4

Instrumenti

Prvi deo instrumenta obuhvatao je pitanja koja se odnose na lične karakteristike ispitanika i kontekst rada, kao što su: pol, uzrast, radni staž (broj godina provedenih u nastavi), nivo obrazovanja (završene osnovne, master, specijalističke ili doktorske studije), okruženje škole (urbano/ruralno), tip škole, oblast nastave (grupa predmeta), status odeljenjskog starešine, materijalni status i učešće u aktivnostima stručnog usavršavanja. U Srbiji, prosvetni radnici imaju zakonsko pravo i obavezu da se godišnje uključuju u različite oblike stručnog usavršavanja (Ministarstvo prosvete, nauke i tehnološkog razvoja, 2021). U istraživanju je učešće u aktivnostima stručnog usavršavanja operacionalizovano kroz samoocenjenu učestalost na godišnjem nivou (u rasponu od nepohađanja do učestalog pohađanja). Drugi deo instrumenta činio je upitnik Maslach Burnout Inventory – Educators Survey (MBI-ES; Maslach & Jackson, 1981) koji meri sindrom sagorevanja kod nastavnika. Ova skala sadrži 22 stavke koje mere tri dimenzije sagorevanja (emocionalna iscrpljenost – EE, lično postignuće – PA i depersonalizacija – DP), a odgovori se daju na sedmostepenoj Likertovoj skali (od 0 = nikada do 6 = svaki dan). Skala je u ovom istraživanju pokazala dobru unutrašnju konzistentnost, pri čemu su vrednosti Kronbahove alfe za sve podskale bile iznad .70.

Postupak i plan analize podataka

Istraživanje je sprovedeno putem upitnika, kao transverzalno istraživanje, uz primenu prigodnog uzorkovanja. Podaci su prikupljeni tokom juna i jula 2024. godine putem onlajn upitnika kreiranog u Google Forms-u. Link ka anketi distribuiran je putem zvaničnih školskih mejling lista i profesionalnih grupa na društvenim mrežama. Učešće je bilo dobrovoljno i anonimno, a svi ispitanici su pre popunjavanja upitnika dali pristanak za učešće u istraživanju. U analizu su uključeni samo upitnici koji su bili potpuno popunjeni.

Prvo su izračunate deskriptivne statistike za sve varijable. Pirsonovi koeficijenti korelacije korišćeni su za ispitivanje povezanosti između subskala sagorevanja i socio-demografskih i varijabli radnog mesta. Višestruka linearna regresiona analiza primenjena je radi identifikacije prediktora svake od tri dimenzije sagorevanja. Pre sprovođenja regresione analize, proverene su pretpostavke normalnosti, linearnosti, homoskedastičnosti, kao i odsustva multikolinearnosti. Za ispitivanje razlika između nastavnika prvog i drugog ciklusa osnovne škole, sprovedene su dodatne analize na poduzorku nastavnika zaposlenih u osnovnim školama, uz primenu *t*-testa i χ^2 testa nezavisnosti. Sve statističke analize izvršene su u programu IBM SPSS Statistics 26.

Rezultati

Deskriptivna statistika

Na osnovu klasifikacije rezultata iz MBI priručnika (Maslach et al., 2016), deskriptivni pokazatelji (Tabela 2) ukazuju na umereno visok nivo emocionalne iscrpljenosti (EE), nizak do umeren nivo depersonalizacije (DP) i visok nivo ličnog postignuća (PA).

Tabela 2
Deskriptivne statistike subskala sagorevanja nastavnika (N = 883)

Subskala	Raspon	*M*	*SD*	Varijansa
Emocionalna iscrpljenost	0-60	3.29	1.82	3.31
Lično postignuće	8-39	4.41	1.36	1.88
Depersonalizacija	0-22	1.43	1.56	2.50

Napomena. *N* predstavlja broj ispitanika; *M* predstavlja prosek; *SD* predstavlja standardnu devijaciju.

Približno 60% nastavnika u našem uzorku iskusilo je hroničnu emocionalnu iscrpljenost. Varijabilnost rezultata ukazuje da postoji značajna podgrupa nastavnika sa veoma visokim nivoom iscrpljenosti, iako su prosečni nivoi EE umereno visoki. Ispitanici su u proseku prijavili nizak nivo depersonalizacije. Međutim, zabrinjavajući trend uočen je kod stavke DP11 – „Brinem da me ovaj posao emocionalno opterećuje" (*M* = 3.29), što ukazuje da deo nastavnika strahuje od emocionalnog udaljavanja od svog posla i učenika. Uočena varijabilnost ukazuje da pojedine podgrupe nastavnika mogu biti u većem riziku i da zahtevaju dodatnu pažnju i ciljanu podršku. Nastavnici su iskusili visoke nivoe ličnog postignuća (PA), što ukazuje na snažan osećaj profesionalne kompetentnosti i uspeha. Visoki rezultati na ovoj subskali ukazuju da, uprkos prisustvu emocionalne iscrpljenosti, postoji značajan zaštitni faktor u vidu profesionalne efikasnosti i osećaja ličnog ispunjenja.

Povezanost socio-demografskih i karakteristika radnog mesta sa dimenzijama sagorevanja

Pirsonovi koeficijenti korelacije izračunati su radi ispitivanja povezanost između socio-demografskih varijabli i varijabli vezanih za radno mesto (stavke 1–10), kao i tri subskale sagorevanja merene MBI-ES instrumentom (Tabela 3). Cilj ove analize bio je da se identifikuju potencijalni protektivni faktori i faktori rizika, kao i grupe nastavnika koje su potencijalno osetljivije na sagorevanje. Subskale sagorevanja su značajno međusobno povezane u očekivanim teorijskim pravcima, što je u skladu sa multidimenzionalnom strukturom sagorevanja (Maslach et al., 2016).

Uočena je značajna negativna korelacija između materijalnog statusa, tipa škole, radnog staža, uzrasta i pola sa emocionalnom iscrpljenošću (EE). Nije utvrđena značajna povezanost između EE i oblasti nastave, kao ni statusa odeljenjskog starešine. Kada je reč o depersonalizaciji (DP), uočene su korelacije sa statusom odeljenjskog starešine, učešćem u stručnom usavršavanju i materijalnim statusom. Nije utvrđena značajna povezanost između DP i uzrasta, pola, radnog staža, nivoa obrazovanja ili grupe predmeta. Subskala ličnog postignuća (PA) povezana je sa statusom odeljenjskog starešine, oblašću nastave i tipom škole. Nije utvrđena značajna povezanost PA sa polom, uzrastom, radnim stažom, materijalnim statusom ili nivoom obrazovanja nastavnika.

Tabela 3
Korelacije socio-demografskih i karakteristika radnog mesta i subskala sagorevanja nastavnika

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Pol	1												
2. Godine	.088**	1											
3. Radni staž	.115**	.832**	1										
4. Nivo obrazovanja	-.067*	-.242**	-.226**	1									
5. Materijalni status	-.022	-.115**	-.066*	.098**	1								
6. Školsko okruženje	-.013	.063	.058	-.056	-.007	1							
7. Profesionalno usavršavanje	.019	.009	-.013	-.041	-.007	-.015	1						
8. Tip škole	-.182**	-.063	-.088**	.131**	.080*	.076*	.019	1					
9. Status odeljenskog starešine	.173**	.099**	.147**	-.088**	-.046	.023	.000	-.654**	1				
10. Grupa predmeta	.061	.088*	.100**	-.023	-.026	.063	.034	-.473**	.920**	1			
11. EE	.073*	.061	.135**	-.043	-.196**	.025	-.018	-.069*	.007	-.041	1		
12. PA	.020	.018	.039	-.003	.029	.008	.026	-.118**	.189**	.148**	-.326**	1	
13. DP	-.014	-.014	.035	.016	-.087**	.014	-.066*	.031	-.074*	-.046	.606**	-.459**	1

Napomena. ** –- korelacija je statistički značajna na nivou 0.01; * - korelacija je statistički značajna na nivou 0.05; *EE* – emocionalna iscrpljenost; *PA* – lično postignuće; *DP* – depersonalizacija.

Višestruka linearna regresija

Da bi se ispitalo kako pol, uzrast, radni staž, nivo obrazovanja, materijalni status, okruženje škole, tip škole, status odeljenjskog starešine, učešće u programima stručnog usavršavanja i oblast nastave predviđaju sagorevanje nastavnika, sprovedena je višestruka linearna regresiona analiza.

Emocionalna iscrpljenost

Analiza varijanse pokazala je da je ukupni regresioni model za predviđanje EE statistički značajan, $F(10, 721) = 6.86$, $p < .001$ (Tabela 4). Prediktori zajedno objašnjavaju približno 8.7% varijanse EE ($R^2 = .09$, korigovani $R^2 = .07$), što je, iako umereno, značajno u kontekstu složenih psiholoških konstrukata, u koje spada i sagorevanje. Standardna greška procene iznosila je 12.40.

Tabela 4

Rezime analize varijanse regresionog modela za predviđanje emocionalne iscrpljenosti

Model		*SS*	*df*	*MS*	*F*	*Sig.*
	Regresija	10545.60	10	1054.56	6.86	.000
1	Ostatak	110826.31	721	153.71		
	Ukupno	121371.92	731			

Napomena. *SS* predstavlja sumu kvadrata; *df* predstavlja stepene slobode; *MS* predstavnja srednju kvadratnu vrednost; *F* predstavlja *F*-vrednost; *Sig.* predstavlja p-vrednost.

Tabela 5

Regresioni koeficijenti za predviđanje emocionalne iscrpljenosti

Prediktor	*B* (Unstandardized)	*SE B*	*β*	*t*	*p*
(Konstanta)	34.45	4.17	—	8.27	.00
Pol	.96	1.26	.03	.76	.45
Godine	-2.43	.81	-.19	-2.98	.00
Radni staž	3.99	.85	.30	4.71	.00
Nivo obrazovanja	.34	.78	.02	.44	.66
Materijalni status	-4.43	.87	-.18	-5.07	.00
Školsko okruženje	1.20	.98	.04	1.22	.22
Profesionalno usavršavanje	-.01	.56	-.00	-.02	.98
Tip škole	-1.24	.50	-.10	-2.50	.01
Status odeljenskog starešine	.91	.47	.18	1.92	.05
Grupa predmeta	-1.40	.47	-.28	-3.01	.00

Napomena. *B* predstavlja nestandardizovani koeficijent; *SE B* predstavlja standardnu grešku koeficijenta; *β* označava standardizovani koeficijent; *t* označava *t*-vrednost; a *p* označava *p*-vrednost.

Regresiona analiza (Tabela 5) pokazala je nekoliko značajnih prediktora EE. Radni staž se izdvojio kao najjači pozitivan prediktor, a sa porastom staža, vrednosti EE rastu u proseku za oko 4 poena. Uzrast je imao značajnu negativnu povezanost sa EE, smanjujući vrednosti za oko 2.4 poena. Oblast nastave takođe je značajan prediktor – nastavnici društvenih, praktičnih i umetničkih predmeta prijavljuju niže nivoe EE u odnosu na nastavnike prirodnih nauka. Materijalni status je negativno povezan sa EE, što znači da nastavnici sa boljim finansijskim uslovima imaju manji nivo iscrpljenosti. Tip škole se takođe pokazao kao značajan prediktor; nastavnici u srednjim školama imaju niži nivo EE u odnosu na nastavnike u osnovnim školama. Takođe, status odeljenjskog starešine pokazao je graničnu statističku značajnost, što ukazuje na moguću tendenciju višeg EE kod odeljenskih starešina, ali ovaj nalaz zahteva dodatna istraživanja. Pol, okruženje škole, nivo obrazovanja i učešće u stručnom usavršavanju nisu se pokazali kao značajni prediktori EE.

Lično postignuće

Analiza varijanse pokazala je da je regresioni model za PA statistički značajan, $F(10.721) = 2.44$, $p = .007$ (Tabela 6). Prediktori su zajednički objasnili približno 3.3% varijanse ličnog postignuća (PA) ($R^2 = .03$, korigovani $R^2 = .02$). Iako je ovaj procenat skroman, rezultat je značajan u kontekstu proučavanja složenih ljudskih stanja kao što je sindrom sagorevanja. Standardna greška procene iznosila je 6.96.

Tabela 6
Rezime analize varijanse regresionog modela za predviđanje ličnog postignuća

Model		SS	df	MS	F	Sig.
1	Regresija	1181.49	10	118.15	2.44	.007
	Ostatak	34917.03	721	48.43		
	Ukupno	36098.52	731			

Napomena. *SS* predstavlja sumu kvadrata; *df* predstavlja stepene slobode; *MS* predstavnja srednju kvadratnu vrednost; *F* predstavlja *F*-vrednost; *Sig*. predstavlja p-vrednost.

Regresiona analiza (Tabela 7) pokazala je da je grupa predmeta koju nastavnik predaje najjači pozitivan prediktor ličnog postignuća (PA), što ukazuje da nastavnici društvenih, umetničkih i praktičnih predmeta iskazuju značajno više nivoe PA u odnosu na nastavnike prirodnih nauka. Status odeljenjskog starešine pokazao je granično statistički značajnu negativnu povezanost sa PA, što ukazuje na moguću tendenciju nešto nižeg nivoa PA kod odeljenjskih starešina, iako ovaj nalaz nije dostigao uobičajene nivoe statističke značajnosti. Slično tome, materijalni status pokazao je granično pozitivnu povezanost sa PA, što sugeriše da nastavnici sa boljim finansijskim statusom mogu imati nešto više nivoe PA. Ostale varijable – tip škole, radni staž, uzrast, pol, okruženje škole, nivo obrazo-

vanja i učešće u stručnom usavršavanju – nisu se pokazale kao značajni prediktori nivoa PA u ovom modelu.

Tabela 7
Regresioni koeficijenti za predviđanje ličnog postignuća

Prediktor	*B* (Unstandardized)	*SE B*	*β*	*t*	*p*
(Konstanta)	30.63	2.34	—	13.09	.00
Pol	.52	.71	.030	.74	.46
Godine	-.06	.46	-.01	-.13	.89
Radni staž	-.15	.48	-.02	-.32	.75
Nivo obrazovanja	.20	.44	.02	.47	.64
Materijalni status	.81	.49	.06	1.66	.09
Školsko okruženje	.09	.55	.01	.16	.87
Profesionalno usavršavanje	.18	.32	.02	.57	.57
Tip škole	.07	.28	.01	.25	.80
Status odeljenskog starešine	-.44	.26	-.16	-1.68	.09
Grupa predmeta	.84	.26	.30	3.19	.00

Napomena. *B* predstavlja nestandardizovani koeficijent; *SE B* predstavlja standardnu grešku koeficijenta; *β* označava standardizovani koeficijent; *t* označava *t*-vrednost, a *p* označava *p*-vrednost.

Depersonalizacija

Analiza varijanse pokazala je da je ukupni regresioni model za predviđanje depersonalizacije (DP) statistički značajan, $F(10, 721) = 2.09$, $p = .02$ (Tabela 8). Model je objasnio približno 2,8% varijanse DP ($R^2 = .03$, korigovani $R^2 = .01$). Iako je ovaj procenat mali, nalazi mogu biti korisniji za identifikovanje rizičnih grupa nego za precizno predviđanje nivoa DP kod pojedinaca. Standardna greška procene iznosila je 4.97.

Tabela 8
Rezime analize varijanse regresionog modela za predviđanje depersonalizacije

Model		*SS*	*df*	*MS*	*F*	*Sig.*
	Regresija	515.180	10	51.518	2.09	.02
1	Ostatak	17808.683	721	24.700		
	Ukupno	18323.863	731			

Napomena. *SS* predstavlja sumu kvadrata; *df* predstavlja stepene slobode; *MS* predstavnja srednju kvadratnu vrednost; *F* predstavlja *F*-vrednost; *Sig.* predstavlja *p*-vrednost.

Regresionom analizom (Tabela 9) identifikovana su tri značajna prediktora depersonalizacije (DP). Radni staž se izdvojio kao najjači pozitivan prediktor, što ukazuje da postoji veća verovatnoća da nastavnici sa više godina radnog iskustva prijave više nivoe DP. Uzrast je imao značajnu negativnu povezanost sa DP, što znači da su stariji nastavnici manje skloni depersonalizaciji. Materijalni status se takođe pokazao kao značajan negativan prediktor, što ukazuje da nastavnici sa boljim finansijskim položajem prijavljuju niže nivoe DP. Ostale varijable – pol, okruženje škole, nivo obrazovanja, stručno usavršavanje, tip škole, status odeljenjskog starešine i grupa predmeta – nisu se pokazale kao značajni prediktori DP u ovom modelu.

Tabela 9
Regresioni koeficijenti za predviđanje depersonalizacije

Prediktor	*B* (Unstandardized)	*SE B*	*β*	*t*	*p*
(Konstanta)	9.95	1.67	—	5.96	.00
Pol	-.43	.51	-.03	-.85	.39
Godine	-.80	.33	-.16	-2.45	.01
Radni staž	1.07	.34	.20	3.16	.00
Nivo obrazovanja	.16	.31	.02	.51	.61
Materijalni status	-.79	.35	-.08	-2.26	.02
Školsko okruženje	.20	.39	.02	.51	.61
Profesionalno usavršavanje	-.31	.23	-.05	-1.39	.16
Tip škole	-.16	.20	-.03	-.80	.42
Status odeljenskog starešine	.17	.19	.09	.91	.36
Grupa predmeta	-.29	.19	-.15	-1.56	.12

Napomena. B predstavlja nestandardizovani koeficijent; *SE B* predstavlja standardnu grešku koeficijenta; *β* označava standardizovani koeficijent; *t* označava *t*-vrednost; a *p* označava *p*-vrednost.

Razlike između nastavnika prvog i drugog ciklusa osnovne škole

Da bi se ispitale razlike između nastavnika prvog i drugog ciklusa osnovne škole, sprovedene su dodatne analize na poduzorku nastavnika zaposlenih u osnovnim školama. Nakon filtriranja podataka (tip škole = 1 ili 2) konstruisana je varijabla za grupisanje, kojom su ispitanici podeljeni na nastavnike prvog i drugog ciklusa. Raspodele rezultata za EE, DP i PA procenjene su na osnovu indikatora asimetrije i spljoštenosti, pri čemu su ocenjene kao približno normalne, što je opravdalo primenu parametarskih testova. Razlike u uzrastu i dimenzijama sagorevanja ispitivane su pomoću *t*-testa za nezavisne uzorke. Pre svake analize proverena je homogenost varijansi primenom Levenovog testa. U slučajevi-

ma kada nije bilo značajnih razlika u varijansama, primenjena je standardna verzija *t*-testa. Razlike u nivou obrazovanja analizirane su χ^2 testom nezavisnosti.

Demografske razlike između grupa nastavnika

Analizom smo najpre ispitali razlike u osnovnim demografskim karakteristikama ispitanika, konkretno u uzrastu. Rezultati *t*-testa pokazali su statistički značajnu razliku u uzrastu između nastavnika prvog i drugog ciklusa. U proseku, nastavnici prvog ciklusa bili su stariji ($M = 3.26$, $SD = 0.99$) u odnosu na nastavnike drugog ciklusa ($M = 3.01$, $SD = 0.99$), $t(524.90) = 3.13$, $p = .002$.

Dalje, χ^2 test nije pokazao statistički značajnu povezanost između uloge nastavnika i nivoa obrazovanja, $\chi^2(3) = 1.16$, $p = .762$. Obe grupe imale su sličan nivo obrazovanja, pri čemu je većina nastavnika u obe grupe završila osnovne ili master studije.

Tabela 10
Struktura nivoa obrazovanja nastavnika prvog i drugog ciklusa

Nivo obrazovanja	Nastavnici prvog ciklusa %	Nastavnici drugog ciklusa %	Suma %
Osnovne studije	52.4	48.3	49.9
Master studije	44.7	48.8	47.2
Specijalističke studije	2.0	1.9	1.9
Doktorske studije	0.8	1.1	1.0
Suma	100.0	100.0	100.0

Razlike u nivou sagorevanja između grupa nastavnika

Rezultati *t*-testa nisu pokazali statistički značajnu razliku u nivou emocionalne iscrpljenosti (EE) između nastavnika prvog i drugog ciklusa. Iako su nastavnici drugog ciklusa prijavili nešto viši prosek ($M = 3.43$, $SD = 1.39$) u odnosu na nastavnike prvog ciklusa ($M = 3.33$, $SD = 1.39$), ta razlika nije bila statistički značajna, $t(619) = -0.86$, $p = .388$. S druge strane, utvrđena je statistički značajna razlika u nivou ličnog postignuća (PA). Nastavnici prvog ciklusa prijavili su više vrednosti ($M = 4.69$, $SD = 0.83$) u odnosu na nastavnike drugog ciklusa ($M = 4.28$, $SD = 0.85$), $t(619) = 5.85$, $p < .001$). Takođe je uočena statistički značajna razlika u nivou depersonalizacije (DP). Nastavnici drugog ciklusa pokazali su više vrednosti ($M = 1.53$, $SD = 0.96$) u odnosu na nastavnike prvog ciklusa ($M = 1.32$, $SD = 1.00$), $t(619) = -2.65$, $p = .008$.

Diskusija

Cilj ovog istraživanja bio je da ispita odnose između ličnih i faktora radnog okruženja, kao i njihov doprinos sagorevanju nastavnika u Srbiji. Rezultati su pokazali značajnu

povezanost ovih faktora sa nivoom sagorevanja, čime je nulta hipoteza odbačena. Nastavnici su istovremeno prijavili visok nivo ličnog postignuća i povišene nivoe emocionalne iscrpljenosti i depersonalizacije. Ovaj paradoks može ukazivati na razliku između percipirane vrednosti rada i "emocionalnih utrošaka": nastavnici mogu doživljavati svoj rad kao smislen i ispunjavajući, ali da pritom istovremeno nose značajno emocionalno opterećenje koje dovodi do iscrpljenosti i distanciranja od posla.

Hipoteza 1 je potvrđena, odnosno potvrđeno je da nastavnici sa dužim radnim stažom imaju viši nivo sagorevanja. Radni staž je snažno povezan sa višim EE i DP, što ukazuje na to da akumulacija stresa tokom dužeg perioda doprinosi razvoju sagorevanja. Ovo saznanje je u skladu sa prethodnim nalazima, koji pokazuju da je kod nastavnika sa više od 11 godina radnog iskustva prisutan viši nivo sagorevanja, posebno emocionalne iscrpljenosti (Yorulmaz & Altınkurt, 2018). Istovremeno, radni staž se pokazao kao pozitivan prediktor depersonalizacije, dok je uzrast nastavnika delovao kao negativan prediktor. Iako su ove varijable obično usko povezane, ovaj nalaz ukazuje da DP može biti više uslovljena dugotrajnim profesionalnim opterećenjem nego samim uzrastom. Ovo podržava teorijske modele koji naglašavaju ulogu zahteva posla i resursa u razvoju sagorevanja (Bakker & de Vries, 2021; Hakanen et al., 2006). Hipoteza 2 je takođe potvrđena, jer je niži materijalni status povezan sa većom emocionalnom iscrpljenošću i DP, dok su bolji finansijski uslovi delovali kao zaštitni faktor, što je u skladu sa prethodnim istraživanjima (Candeias et al., 2020). Potvrđena je i Hipoteza 3: stariji nastavnici pokazali su niže nivoe EE i DP, što može odražavati razvijenije mehanizme suočavanja i realnija profesionalna očekivanja, u skladu sa nalazima da su mlađi nastavnici podložniji sagorevanju (Al Asadi et al., 2018; Zhang, 2022).

Hipoteza 4, koja se odnosi na nivo sagorevanja nastavnika u različitim tipovima škola, delimično je potvrđena. Nastavnici u srednjem obrazovanju prijavili su značajno niže nivoe EE u odnosu na nastavnike u osnovnim školama, što je u skladu sa prethodnim nalazima da nastavnici u osnovnim školama često rade u emocionalno zahtevnijim uslovima sa manjim stepenom autonomije (Kimsesiz, 2019). Dodatne analize kojima smo poredili nastavnike prvog i drugog ciklusa osnovne škole nisu pokazale značajne razlike u EE, ali su otkrile razlike u drugim dimenzijama sagorevanja. Nastavnici prvog ciklusa prijavili su više nivoe ličnog postignuća, što se može objasniti kontinuiranim odnosom sa učenicima, većom vidljivošću pedagoškog uticaja i jasnijem uviđanju rezultata rada, što se sve smatra zaštitnim faktorima od sagorevanja (Saloviita & Pakarinen, 2021; Skaalvik & Skaalvik, 2018). Nasuprot tome, nastavnici drugog ciklusa pokazali su više nivoe DP, potencijalno zbog većeg broja učenika, fragmentiranih odnosa i jačeg pritiska procenjivanja, što može podstaći emocionalno distanciranje (Leiter et al., 2023). Ovaj obrazac podržava stanovište da je sagorevanje višedimenzionalni fenomen, koji je uslovljen sistemskim i organizacionim faktorima, uključujući organizaciju rada i dostupnost podrške (Bakker & de Vries, 2021; Hakanen et al., 2006).

Hipoteza 5 je potvrđena, jer su nastavnici društvenih, umetničkih i praktičnih predmeta prijavili niže nivoe EE i više nivoe PA u odnosu na nastavnike prirodnih nauka. Ovo je u skladu sa prethodnim istraživanjima, koja ukazuju na viši nivo sagorevanja kod na-

stavnika STEM oblasti (nauka, tehnologija, inženjerstvo i matematika), usled većeg obima posla, jačeg pritiska u vezi sa postignućima učenika, integracije tehnologije i povećanih profesionalnih zahteva (Agyapong et al., 2022; Magtalas & Eduvala, 2024; Saloviita & Pakarinen, 2021; Tu et al., 2025). Ovi nalazi podržavaju pretpostavku da nastavnici STEM oblasti mogu biti izloženi većem riziku od sagorevanja usled kumulativnih tehničkih i kurikularnih zahteva.

Hipoteza 6, koja se odnosi na funkciju odeljenjskog starešine, delimično je potvrđena. Status odeljenjskog starešine pokazao je granično značajnu tendenciju ka višem nivou EE i nižem nivou PA, iako efekat nije dostigao punu statističku značajnost u svim dimenzijama sagorevanja. Ova uloga često podrazumeva dodatne administrativne, organizacione i emocionalne obaveze izvan same nastave, kao što su intenzivna komunikacija sa roditeljima, vođenje dokumentacije i podrška učenicima. Prethodna istraživanja dosledno pokazuju da emocionalni zahtevi i administrativno opterećenje doprinose EE i DP, što podržava pretpostavku da odeljenjske starešine mogu biti izložene većem riziku od sagorevanja (Hakanen et al., 2006; Leiter et al., 2023; Skaalvik & Skaalvik, 2018).

Konačno, Hipoteza 7 je potvrđena, budući da pol i nivo obrazovanja nisu bili značajni prediktori sagorevanja. Iako se sagorevanje češće javlja kod žena, polne razlike su često uslovljene ulogama u okviru organizacije, stepenom autonomije i pozicijom u karijeri, a ne samim polom (Schaufeli & Buunk, 2003). Istraživanja o nastavnicima daju neujednačene rezultate, a neke studije ne nalaze značajne razlike, kao što je slučaj sa nastavnicima osnovnih škola u Finskoj (Saloviita & Pakarinen, 2021). Kada je reč o nivou obrazovanja, nalazi ovog istraživanja razlikuju se od ranijih studija koje ukazuju da nastavnici sa višim akademskim stepenom mogu imati viši nivo sagorevanja (Yorulmaz & Altınkurt, 2018), što ukazuje da ovaj faktor zahteva dodatna istraživanja.

Zaključak

Ovo istraživanje ispitivalo je odnos između ličnih i radnih karakteristika i sagorevanja nastavnika u srpskom obrazovnom kontekstu. Rezultati pokazuju da sagorevanje zavisi od kombinacije individualnih i kontekstualnih faktora. Pojedini faktori imaju snažniji uticaj na emocionalnu iscrpljenost i depersonalizaciju, dok drugi deluju kao zaštitni faktori, naročito u odnosu na lično postignuće. Ovi nalazi ukazuju na potrebu za sistemskim i kontekstualno osetljivim pristupom u rešavanju problema sagorevanja nastavnika, umesto fokusiranja isključivo na jačanje individualnih kapaciteta. Razumevanje povezanosti ličnih faktora u kontekstu radnog mesta i sagorevanja nastavnika može da doprinese razvoju preventivnih strategija u okviru obrazovnog sistema.

Ograničenja

Potrebno je ukazati na nekoliko ograničenja ovog istraživanja. Prvo, transverzalni dizajn istraživanja ne omogućava izvođenje uzročnih zaključaka o odnosima između ličnih i radnih karakteristika i dimenzija sagorevanja, te su longitudinalna istraživanja neophodna

radi razjašnjenja pravca ovih povezanosti tokom vremena. Drugo, objašnjena varijansa ishoda sagorevanja bila je relativno skromna, što ukazuje da drugi, neispitani faktori mogu imati značajnu ulogu. Psihološke varijable kao što su samoefikasnost, stil suočavanja i percipirana socijalna podrška nisu direktno ispitivane i trebalo bi ih uključiti u buduća istraživanja. Kulturne specifičnosti srpskog obrazovnog konteksta takođe mogu ograničiti mogućnost za generalizaciju ovih nalaza, što upućuje na činjenicu da međunarodna komparativna istraživanja mogu biti veoma značajna pri ispitivanju ovog problema. Pored toga, stručno usavršavanje je mereno isključivo kroz učestalost učešća, dok nisu razmatrani tip stručnog usavršavanja, njegov intenzitet, niti pitanje da li je bilo dobrovoljno ili obavezno, što bi trebalo preciznije ispitati u budućim studijama.

Takođe treba napomenuti da instrumenti korišćeni u ovom istraživanju, iako psihometrijski validirani, ne obuhvataju u potpunosti važne aspekte savremenog školskog konteksta, kao što su administrativno opterećenje, pritisci povezani sa eksternim evaluacijama i brze promene u planovima i programima nastave i učenja. Ovi faktori mogu predstavljati značajne izvore sagorevanja nastavnika i delimično objasniti relativno niske korelacije i ograničenu objašnjenu varijansu uočenu u ovom istraživanju (Saloviita & Pakarinen, 2021; Skaalvik & Skaalvik, 2018). Stoga, iako istraživanje doprinosi razumevanju individualnih korelata sagorevanja, ono ne pruža sveobuhvatno objašnjenje ovog fenomena, budući da ključni organizacioni i sistemski faktori nisu direktno ispitivani. U analizu su uključene samo šire karakteristike na nivou škole, kao što su tip škole, oblast nastave i okruženje škole, kao kontekstualni pokazatelji.

Preporuke

Ovo istraživanje nudi nekoliko praktičnih implikacija za srpski obrazovni sistem. Nalaz da nastavnici istovremeno prijavljuju visok nivo emocionalne iscrpljenosti i visok nivo ličnog postignuća ukazuje da prevencija sagorevanja ne treba da bude usmerena isključivo na jačanje motivacije, već i na pomoć nastavnicima da uspostave održive emocionalne granice u svakodnevnoj praksi. Buduća istraživanja bi stoga trebalo detaljnije da ispitaju konkretne izvore EE, jer bi identifikovanje ovih mehanizama moglo doprineti razvoju preciznijih intervencija i smanjenju ukupnog nivoa sagorevanja. Nalaz da radni staž, ali ne i hronološki uzrast, predviđa sagorevanje, ukazuje na značaj kumulativne izloženosti stresorima na radnom mestu, posebno u sistemima u kojima pojedinci ulaze u nastavničku profesiju kasnije u životu. Ovo ukazuje na značaj kolektivnih oblika podrške, kao što su mentorstvo među kolegama, zajednice prakse i grupno savetovanje; oblika podrške usmerenih na ublažavanje dugoročnog profesionalnog opterećenja (Farber, 2000; Ly & Hong, 2025).

Povezanost između nižeg materijalnog statusa i višeg nivoa sagorevanja dodatno naglašava značaj strukturnih ekonomskih uslova, što znači da unapređenje finansijske sigurnosti nastavnika može predstavljati važnu strategiju prevencije. Razlike između nastavnika prvog i drugog ciklusa, posebno viši nivo PA i niži nivo DP kod nastavnika prvog ciklusa, zaslužuju dodatnu pažnju, jer ovi nastavnici mogu predstavljati korisne modele

adaptivne prakse. Viši nivo sagorevanja kod nastavnika iz STEM oblasti može odražavati rastuće kurikularne i tehnološke zahteve, što ukazuje na potrebu za ciljanim stručnim usavršavanjem, jačom kadrovskom podrškom i zajedničkim planiranjem nastave (Voogt et al., 2011). Na kraju, uloga odeljenjskog starešine ostaje nedovoljno istražena, ali potencijalno predstavlja jedan od ključnih faktora u razumevanju sagorevanja nastavnika, što ukazuje na potrebu za daljim istraživanjima i razmatranjem jačanja institucionalne podrške ovoj ulozi. Globalno posmatrano, sagorevanje treba razumeti kao rezultat interakcije individualnih i kontekstualnih faktora, a ne isključivo kao individualni problem (Bakker & de Vries, 2021; Hakanen et al., 2006). Stoga preventivni programi treba da obuhvate ne samo intervencije na nivou pojedinca, već i sistemske promene, kao što su smanjenje administrativnog opterećenja, manji broj učenika u odeljenjima, jačanje formalnog sistema mentorstva i podrške školskog rukovodstva (Leiter et al., 2023). Budući da naše istraživanje nije u potpunosti obuhvatilo ove faktore, naglašava se potreba za budućim istraživanjima usmerenim na mehanizme institucionalne podrške i sistemske uslove koji potencijalno utiču na sagorevanje nastavnika.

Dostupnost podataka

Podaci koji podržavaju nalaze ovog istraživanja dostupni su na zahtev upućen autoru.

Izjava o upotrebi generativne veštačke inteligencije (VI) u naučnom pisanju

Tokom pripreme ovog rada korišćena je VI alat za stilsku obradu teksta, međutim, sadržaj i naučni zaključci su isključivo proizvodi rada autora.

Literatura

Aflakseir, A., & Nemati, O. (2018). Association Between Work—Related Stress and Burnout Among a Group of the Elementary and High School Teachers in Zarrin—Dasht—Fars. *International Journal of School Health*, *5*(2), 1-4. https://doi.org/10.5812/intjsh.64096

Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022). Stress, Burnout, Anxiety and Depression among Teachers: A Scoping Review. *International Journal of Environmental Research and Public Health*, *19*(17), 10706. https://doi.org/10.3390/ijerph191710706

Al Asadi, J., Khalaf, S., Al Waaly, A., Abed, A., & Shami, S. (2018). Burnout among primary school teachers in Iraq: Prevalence and risk factors. *Eastern Mediterranean Health Journal*, *24*(3), 262–268. https://doi.org/10.26719/2018.24.3.262

Bakker, A. B., & de Vries, J. D. (2021). Job demands–resources theory and self-regulation: New explanations and remedies for job burnout. *Anxiety, Stress, & Coping, 34*(1), 1–21. https://doi.org/10.1080/10615806.2020.1797695

Buonomo, I., Fatigante, M., & Fiorilli, C. (2017). Teachers' Burnout Profile: Risk and Protective Factors. *The Open Psychology Journal*, *10*(1), 190–201. https://doi.org/10.2174/1874350101710010190

Candeias, A., Galindo, E., Calisto, I., Borralho, L., & Reschke, K. (2020). Stress and burnout in teaching. Study in an inclusive school workplace. *Health Psychology Report*, *9*(1), 63–75. https://doi.org/10.5114/hpr.2020.100786

Chang, M. L. (2013). Toward a theoretical model to understand teacher emotions and teacher burnout in the context of student misbehaviour: Appraisal, regulation and coping. *Motivation and Emotion, 37*(4), 799-817.http://dx.doi.org/10.1007/s11031-012-93350

Durr, T., Chang, M.-L., & Carson, R. L. (2014). Curbing teacher burnout: the transactional factors of teacher efficacy and emotion management. In P. W. Richardson, S. A. Karabenick, & H. M. G. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 198–213). Routledge.

Eurydice. (2025). *Serbia overview.* European Education and Culture Executive Agency. https://eurydice.eacea.ec.europa.eu/eurypedia/serbia/overview

Farber, B. A. (2000). Treatment strategies for different types of teacher burnout. Journal of Clinical psychology, 56(5), 675-689. https://doi.org/10.1002/(SICI)1097-4679(200005)56:5%3C675::AID-JCLP8%3E3.0.CO;2-D

Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology, 43* (6), 495 -513. https://www.wilmarschaufeli.nl/publications/Schaufeli/246.pdf

Herman, K. C., Hickmon-Rosa, J. E., & Reinke, W. M. (2018). Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *Journal of Positive Behavior Interventions, 20*(2), 90–100. https://doi.org/10.1177/1098300717732066.

Kim, L. E., & Burić, I. (2020). Teacher self-efficacy and burnout: Determining the directions of prediction through an autoregressive cross-lagged panel model. *Journal of Educational Psychology*, *112*(8), 1661–1676. https://doi.org/10.1037/edu0000424

Kimsesiz, F. (2019). The effect of school type on EFL teachers' burnout: The case in Turkey. *Dil ve Dilbilimi Çalışmaları Dergisi*, *15*(4), 1413–1425. https://doi.org/10.17263/jlls.668533

Leiter, M. P., Maslach, C., & Schaufeli, W. B. (2023). Burnout at work: A psychological perspective. *Current Directions in Psychological Science, 32*(1), 3–9. https://www.researchgate.net/publication/263809792_Burnout_at_Work_A_Psychological_Perspective_an_edited_volume

Ly, N. T., & Hong, N. V. (2025). Effects of professional learning communities on job satisfaction of female teachers in Vietnam. *International Journal of Evaluation and Research in Education (IJERE), 14*(1), 85-93.

Maghnouj, S., Bethell, G., Guthrie, C., Kitchen, H., & Salinas, D. (2020). *OECD reviews of evaluation and assessment in education: Serbia*. OECD Publishing. https://doi.org/10.1787/225350d9-en

Magtalas, S. A., & Eduvala, J. C. (2024). Teacher's workload in relation to burnout and work performance. *International Journal of Multidisciplinary: Applied Business and Education Research, 5*(10), 4111–4123. https://doi.org/10.11594/ijmaber.05.10.24

Marek, T., Schaufeli, W. B., & Maslach, C. (2017). *Professional burnout: Recent developments in theory and research.* Routledge.

Marić Jurišin, S. i Malčić, B. (2022). *Samoprocena nastavničke profesije u savremenom obrazovnom kontekstu.* Filozofski fakultet Univerziteta u Novom Sadu.

Marić, N., Maksimović, N., i Bulat, P. (2024). Sindrom sagorevanja na radu kod prosvetnih radnika. *Medicinski podmladak, 71*(2), 258-268.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior*, *2*(2), 99–113. https://doi.org/10.1002/job.4030020205

Maslach, C., Jackson, S. E., & Leiter, M. P. (2016). *Maslach Burnout Inventory Manual* (Fourth Edition). Mind Garden.

Pravilnik o stalnom stručnom usavršavanju i napredovanju u zvanja nastavnika, vaspitača i stručnih saradnika (2021). Prosvetni glasnik, Službeni glasnik RS, br.109/2021.

Padmanabhanunni, A., & Pretorius, T. B. (2023). Teacher Burnout in the Time of COVID-19: Antecedents and Psychological Consequences. *International Journal of Environmental Research and Public Health*, *20*(5), 4204. https://doi.org/10.3390/ijerph20054204

Piperac, P., Todorovic, J., Terzic-Supic, Z., Maksimovic, A., Karic, S., Pilipovic, F., & Soldatovic, I. (2021). The Validity and Reliability of the Copenhagen Burnout Inventory for Examination of Burnout among Preschool Teachers in Serbia. *International Journal of Environmental Research and Public Health*, *18*(13), 6805. https://doi.org/10.3390/ijerph18136805

Popović, D., Minić, V. i Antonijević, R. (2023). Kontekstualni okvir i prevencija sindroma sagorevanja profesionalaca u vaspitno-obrazovnim ustanovama. *Nastava i vaspitanje, 72*(1), 59-72. https://doi.org/10.5937/nasvas2301059P

Rajendran, N., Watt, H. M. G., & Richardson, P. W. (2020). Teacher burnout and turnover intent. *The Australian Educational Researcher*, *47*(3), 477–500. https://doi.org/10.1007/s13384-019-00371-x

Ranđelović, K., Stojiljković, S. i Milojević, M. (2013). Personalni faktori sindroma izgaranja kod nastavnika u okviru teorije samoodređenja. *Zbornik Instituta za pedagoška istraživanja*, *45*(2), 260-281. https://doi.org/10.2298/ZIPI1302260R

Saloviita, T., & Pakarinen, E. (2021). Teacher burnout explained: Teacher-, student-, and organisation-level variables. *Teaching and Teacher Education*, *97*, 103221. https://doi.org/10.1016/j.tate.2020.103221

Schaufeli, W. B., & Buunk, B. P. (2003). Burnout: An Overview of 25 Years of Research and Theorizing. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (Eds.), *The Handbook of Work & Health Psychology* (pp. 383–425). John Wiley & Sons. https://doi.org/10.1002/0470013400.ch19

Schaufeli, W. B., Leiter, M. P., & Maslach, C. (2009). Burnout: 35 years of research and practice. *Career Development International, 14*(3), 204–220. https://doi.org/10.1108/13620430910966406

Skaalvik, E. M., & Skaalvik, S. (2018). Job demands and job resources as predictors of teacher motivation and well-being. *Social Psychology of Education*, *21*, 1251–1275. https://doi.org/10.1007/s11218-018-9464-8

Skaalvik, E. M., & Skaalvik, S. (2014). Teacher self-efficacy and perceived autonomy: Relations with teacher engagement, job satisfaction, and emotional exhaustion. *Psychological Reports, 114*(1), 68–77. https://doi.org/10.2466/14.02.PR0.114k14w0

Tu, L., Rao, Z., Jiang, H., & Dai, L. (2025). Technostress, burnout, and job satisfaction: An empirical study of STEM teachers' well-being and performance. *Behavioral Sciences, 15*(7), 992. https://doi.org/10.3390/bs15070992

Univerzitet u Novom Sadu. (2020). *Kodeks o akademskom integritetu* (prečišćen tekst). https://www.uns.ac.rs/index.php/univerzitet/javnost-rada/dokumenti/aktiuns/send/35-pravilnici/321-kodeks-o-akademskom-integritetu

Unterbrink, T., Hack, A., Pfeifer, R., Buhl-Grießhaber, V., Müller, U., Wesche, H., Frommhold, M., Scheuch, K., Seibt, R., Wirsching, M., & Bauer, J. (2007). Burnout and effort–reward-imbalance in a sample of 949 German teachers. *International Archives of Occupational and Environmental Health*, *80*(5), 433–441. https://doi.org/10.1007/s00420-007-0169-0

Voogt, J., Westbroek, H., Handelzalts, A., Walraven, A., McKenney, S., Pieters, J., & De Vries, B. (2011). Teacher learning in collaborative curriculum design. *Teaching and teacher education, 27*(8), 1235-1244. https://doi.org/10.1016/j.tate.2011.07.003

Yorulmaz, Y. İ., & Altınkurt, Y. (2018). The examination of teacher burnout in Turkey: A meta-analysis. *Turkish Journal of Education*, *7*(1), 34–52. https://doi.org/10.19128/turje.348273

Zhang, L., Zhao, J., Zheng, H., Xiao, Y., Chen, M., Chen, D., & Xiao, H. (2014). Mental health and burnout in primary and secondary school teachers in the remote mountain areas of Guangdong Province in the People's Republic of China. *Neuropsychiatric Disease and Treatment*, *10*, 123-130. https://doi.org/10.2147/NDT.S56020

Zhang, Y., & Zhu, Y. (2022). Effects of educational robotics on the creativity and problem-solving skills of K-12 students: A meta-analysis. *Educational Studies*, *50*(6), 1539-1557. https://doi.org/10.1080/03055698.2022.2107873

Primljeno: 11.07.2025.
Korigovana verzija primljena: 14.01.2026.
Prihvaćeno za štampu: 10.02.2026.

Stanislava Marić Jurišin
Odsek za pedagogiju, Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad, Srbija
https://orcid.org/0000-0002-4184-3309

Borka Malčić
Odsek za pedagogiju, Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad, Srbija
https://orcid.org/0000-0002-1862-962X

Snežana Jokić
Tehnički fakultet, Univerzitet u Novom Sadu, Zrenjanin, Srbija
https://orcid.org/0000-0002-4756-9435

Simona Bekić
Odsek za pedagogiju, Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad, Srbija
https://orcid.org/0000-0002-0974-8846

Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Nastava i vaspitanje, 2026, *75*(2), 325-338
https://doi.org/10.5937/niv75-64857

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Kućna biblioteka kao medijator odnosa između obrazovanja roditelja i postignuća učenika na PISA testiranju u Srbiji

Snežana Štrangarić[1]
Pedagoški fakultet u Somboru, Univerzitet u Novom Sadu, Sombor, Srbija
Vesna Rodić Lukić
Pedagoški fakultet u Somboru, Univerzitet u Novom Sadu, Sombor, Srbija

Apstrakt *Oslanjajući se na teoriju kulture učenja i teoriju kulturne reprodukcije, u radu se ispituje uloga broja knjiga u kućnoj biblioteci kao medijatorske varijable u odnosu između nivoa formalnog obrazovanja roditelja i postignuća učenika na PISA testiranju. Sprovedena je sekundarna analiza podataka prikupljenih u okviru PISA studije iz 2022. godine, na uzorku učenika iz Srbije (N = 620). Za ispitivanje odnosa između obrazovanja majke i oca, broja knjiga u domu ispitanika i postignuća učenika u domenima čitalačke, matematičke i naučne pismenosti, primenjena je tehnika modelovanja strukturnih jednačina zasnovana na parcijalnim najmanjim kvadratima (PLS-SEM). Rezultati pokazuju da broj knjiga u kućnoj biblioteci ima statistički značajan i pozitivan efekat na sva tri domena funkcionalne pismenosti, kao i da obrazovni nivo oba roditelja značajno doprinosi većoj dostupnosti ovog kulturnog resursa u porodičnom okruženju. Istovremeno, utvrđeni su značajni indirektni efekti obrazovanja roditelja na PISA postignuća učenika, što ukazuje na medijatorsku ulogu broja knjiga u domu. Uzimajući u obzir relativno niske vrednosti objašnjene varijanse, ovaj efekat ne treba tumačiti kao direktan uzročni uticaj, već se on interpretira kao indikator širih, strukturno ukorenjenih procesa kulturne i obrazovne reprodukcije. Nalazi rada doprinose razumevanju obrazovnih nejednakosti u Srbiji, ukazujući na to da broj knjiga u kućnoj biblioteci predstavlja vidljivi marker kulturnog kapitala koji posreduje u međugeneracijskoj transmisiji obrazovnih prednosti.*

Ključne reči: *kućna biblioteka, broj knjiga, obrazovanje roditelja, PISA postignuća, kulturni kapital.*

1 snezana.strangaric@uns.ac.rs

Uvod

Uprkos ubrzanom razvoju informacionih tehnologija i sve većoj dominaciji digitalnih medija u svakodnevnom životu, knjiga u svom materijalnom, štampanom obliku zadržava višeslojan kulturni i društveni značaj (Phillips & Kovač, 2022; Rodger, 2018; Štrangarić, 2022). Fizičko prisustvo knjiga ne predstavlja isključivo funkcionalan izvor znanja, već i simbolički resurs koji oblikuje odnos pojedinca prema obrazovanju, kulturi i razvoju intelektualnih kapaciteta. Čak i kada nisu aktivno korišćene, knjige predstavljaju dostupan istraživački alat (da Col, 2015; Karijer i Eko, 2011) i učestvuju u konstruisanju kulturnog okruženja, signalizirajući vrednosti i norme koje se u porodici smatraju legitimnim i poželjnim.

Simbolička dimenzija knjige dobija na značaju u obrazovnom kontekstu, gde brojna empirijska istraživanja na velikim uzorcima sistemski potvrđuju pozitivnu povezanost između posedovanja knjiga u domu i akademskih postignuća učenika (Addido et al., 2025; Evans et al., 2010; Evans et al., 2014; Volodina, 2025). Sekundarne analize empirijske građe, prikupljene u okviru međunarodno komparativnih istraživanja, kao što su PISA i TIMSS, pokazuju da učenici koji odrastaju u okruženju sa većim brojem knjiga postižu bolje rezultate u različitim domenima pismenosti, uključujući čitalačku, matematičku i naučnu pismenost, dok posedovanje knjiga u elektronskom formatu nije pokazalo značajne efekte (Heppt et al., 2022). Ovi nalazi su potvrđeni u različitim nacionalnim i kulturnim kontekstima (Addido et al., 2025), uključujući i kontekst savremenog srpskog društva (Marić i sar., 2018; Radulović et al., 2020; Rodić Lukić et al, 2020; Štrangarić et al., 2017; Štrangarić i Rodić Lukić, 2024), što ukazuje na relativnu univerzalnost efekta kućne biblioteke na obrazovna postignuća.

Prisustvo knjiga u domu doprinosi formiranju kulture učenja (eng. scholarly culture) (Evans et al., 2014; Sikora et al., 2019). Kultura učenja se tokom procesa socijalizacije prenosi kroz svakodnevne prakse, navike i implicitne poruke o značaju učenja i usvajanju znanja. U takvom okruženju, deca ranije dolaze u kontakt sa pisanim jezikom, razvijaju pozitivne stavove prema čitanju i usvajaju kognitivne i metakognitivne strategije koje su kompatibilne sa zahtevima formalnog obrazovnog sistema. Čak i ukoliko se čitanje ne praktikuje intenzivno, same knjige zadržavaju simboličku vrednost koja oblikuje stavove i očekivanja u pogledu obrazovnog uspeha.

U okviru teorije društvene i kulturne reprodukcije, koju je utemeljio francuski sociolog Pjer Burdije (Pierre Bourdieu), posedovanje knjiga u okviru kućnih biblioteka posmatra se u znatno širem društvenom kontekstu u odnosu na teoriju kulture učenja. Dok se u okviru teorije učenja prilazi kućnoj biblioteci kao izolovanom indikatoru socijalizacije orijentisane prema knjigama (Sikora et al., 2019), za Burdijea posedovanje knjiga u kućnoj biblioteci predstavlja tek jedan od indikatora kulturnog kapitala u njegovom opredmećenom obliku, premda najznačajniji. Opredmećeni kulturni kapital je samo jedan od oblika kulturnog kapitala i deluje u sinergiji sa drugim oblicima – otelovljenim i institucionalizovanim. Nadalje, kulturni kapital je samo jedan od oblika kapitala koji, u međudejstvu sa drugim oblicima kapitala – ekonomskim, socijalnim i simboličkim – doprinosi održavanju i legitimisanju društvenih nejednakosti (Bourdieu, 1986).

Iz navedene teorijske perspektive, kućna biblioteka istovremeno predstavlja i materijalno dobro, ali i visoko vrednovano kulturno dobro (Thumala Olave, 2020), te se posmatra kao deo šireg sistema kulturnih praksi i životnih stilova koji su duboko klasno uslovljeni (Bourdieu, 1973; Burdije, 2012; Burdije, 2023). Značajna karakteristika kulturnog kapitala jeste njegova međugeneracijska prenosivost. U tom smislu, viši obrazovni nivo roditelja, kao indikator institucionalizovanog kulturnog kapitala, povećava verovatnoću ne samo prisustva knjiga u domu već i integracije knjiga u svakodnevne prakse kroz razgovore (Chiu & Chow, 2010), zajedničko čitanje i vrednovanje intelektualnih aktivnosti. Na taj način, knjige postaju sredstvo simboličke legitimacije, kao i deo mehanizma putem kojeg se obrazovne nejednakosti reprodukuju kroz generacije (Burdije i Paseron, 2014). Burdijeova teorija u tom smislu ocenjuje proces predškolske socijalizacije kao ključan, u kome se razvija otelovljeni kulturni kapital što rezultira time da poznavanje legitimne kulture i prisnost s njom, iako stečeni, deluju kao urođeni. Tako stečeno znanje o legitimnoj kulturi će kasnije u obrazovnom sistemu biti prepoznato i nagrađivano.

Pojedina istraživanja, nastala na tragu Burdieovog nasleđa, koncipiraju pristup kulturne adaptacije (Cvetičanin, 2007), naglašavajući da je socijalizacija za kulturne prakse celoživotni proces, te da ima kumulativni karakter tokom obrazovne putanje (Aschaffenburg & Mass, 1997). Kroz koncept kulturne adaptacije, nastoji se da se identifikuje značaj iskustava koja se stiču u kasnijem životnom periodu, kroz proces formalnog obrazovanja, u poslovnoj klimi i kroz adaptaciju na različita društvena okruženja.

U savremenim istraživanjima obrazovnih nejednakosti učestalo se koristi varijabla broja knjiga u kućnoj biblioteci, koja se ocenjuje ne samo kao empirijski pristupačan i relativno stabilan indikator kulturnog kapitala, već i kao proksi za širi spektar porodičnih resursa i praksi (Breznau et al., 2019; Heppt et al., 2022). Ipak, postoje određene metodološke neujednačenosti. Određeni autori upozoravaju da ovaj indikator nije lišen ograničenja, budući da može odražavati i druge, teško merljive aspekte porodičnog okruženja. Otvaraju se i pitanja koja se tiču kognitivnih sposobnosti dece da precizno procene broj knjiga u kućnoj biblioteci (Engzell, 2018; Eriksson et al., 2022).

Uprkos navedenim metodološkim dilemama, empirijski nalazi pokazuju da broj knjiga u domu ostaje snažan prediktor obrazovnih ishoda, uključujući lingvističke sposobnosti, matematičke veštine, ali i šire kulturne orijentacije i životne aspiracije (Brunarska & Ivlevs, 2025; Sikora et al., 2019). Ipak, u skladu sa navedenim teorijskim polazištima, važno je naglasiti da konzistentnost efekata kućne biblioteke u različitim kulturnim kontekstima ne ukazuje da broj knjiga u domu deluje kao izolovan uzročni faktor, već kao vidljivi marker dubljih, strukturno ukorenjenih nejednakosti. Dakle, umesto da se ova medijacija tumači kao direktan efekat, gde više knjiga nužno vodi boljim rezultatima, teorijski je opravdanije govoriti o strukturiranom lancu uticaja, u kojem knjige predstavljaju vidljivu tačku ukrštanja institucionalizovanog kulturnog kapitala roditelja, artikulisanog u njihovom nivou formalnog obrazovanja – sa dispozicijama učenika i zahtevima akademskog polja. Prema tome, empirijsko ispitivanje medijatorske uloge broja knjiga možemo oceniti analitički korisnim, ne zato što se time otkriva ili potvrđuje značaj knjiga, već zato što se time omogućava uvid u mehanizme kulturne i obrazovne reprodukcije.

Iz tog razloga, naše istraživanje predstavlja svojevrsnu tačku preseka teorije kulture učenja i teorije kulturne reprodukcije. Za razliku od dosadašnjih istraživanja kulturnog kapitala u našem društvu (Marić i sar, 2018; Radulović et al., 2020; Rodić Lukić et al, 2020; Štrangarić et al., 2017; Štrangarić i Rodić Lukić, 2024), gde je kućna biblioteka posmatrana kao jedan od elemenata kulturnog kapitala u opredmećenom obliku, na ovom mestu želimo posebno da istražimo značaj same kućne biblioteke u skladu sa teorijom kulture učenja. Ipak, u skladu sa teorijom kulturnog kapitala, posmatraćemo je kao medijatora između obrazovanja roditelja i akademskih postignuća. Smatramo da je upravo kroz ispitivanje medijatorske uloge moguće kritički preispitati domete teorije kulture učenja, ali istovremeno i operacionalizovati Burdijeovu tezu o transformaciji kulturnog kapitala u obrazovnu prednost u savremenom obrazovnom kontekstu.

Poseban analitički značaj kućne biblioteke ogleda se u kontekstu PISA istraživanja, budući da PISA ne meri reprodukciju školskog gradiva, već ispituje sposobnost primene znanja u novim i kompleksnim situacijama, putem razvijenih funkcionalnih kompetencija, neophodnih za aktivno učešće u savremenim društvima. Čitalačka, matematička i naučna pismenost razvijaju se u interakciji formalnog obrazovanja i šireg kulturnog okruženja, što porodični kontekst čini ključnim prostorom njihovog oblikovanja (Avvisati, 2020).

Polazeći od navedenih teorijskih i empirijskih uvida, ovo istraživanje nastoji da doprinese razumevanju mehanizama kulturne i obrazovne reprodukcije u Srbiji, ispitujući ulogu broja knjiga u kućnoj biblioteci kao posredničkog faktora u odnosu između obrazovnog statusa roditelja i PISA kompetencija učenika uzrasta od 15 godina. Broju knjiga u kućnoj biblioteci ne pristupa se kao uzročnoj varijabli u uskom smislu, već kao analitičkom alatu za razumevanje složenih procesa društvene i obrazovne reprodukcije u savremenom srpskom društvu. Doprinos ovog istraživanja ogleda se u kritičkom osvetljavanju mehanizama putem kojih se kulturni resursi prevode u merljive obrazovne ishode – procesu u kome knjige u kućnoj biblioteci imaju značajnu ulogu.

Metodologija istraživanja

Cilj istraživanja

Sekundarnom analizom empirijske građe, prikupljene u okviru PISA testiranja iz 2022. godine, nastojali smo da utvrdimo povezanost obrazovnog nivoa roditelja i broja posedovanih knjiga u okviru kućne biblioteke sa kompetencijama učenika iz Srbije.

Uzorak

Podaci su analizirani primenom tehnike strukturnog modelovanja, metodom najmanjih parcijalnih kvadrata (PLS-SEM) kojom se ispituju odnosi između skupova varijabli. Primarno istraživanje obuhvatilo je 6413 ispitanika iz Srbije. S obzirom na to da se pri primeni strukturnog modelovanja preporučuje analiza na manjem uzorku (Hair et al., 2017), formi-

ran je reprezentativni poduzorak koji je obuhvatio 620 učenika. Strukturu našeg uzorka čini 321 ženskih i 299 muških ispitanika. Uzorak je izvučen primenom slučajnog uzorkovanja, čime je obezbeđena reprezentativnost.

Instrumenti i varijable

Analizirane su varijable koje se odnose na stepen obrazovanja roditelja, broj knjiga u okviru kućne biblioteke i postignuća učenika u tri domena pismenosti. Podaci su dobijeni primenom instrumenata PISA baterije testova za učenike i PISA učeničkog upitnika.

PISA baterija testova za učenike obuhvatala je tri kognitivna testa, kojima je mereno postignuće učenika u oblasti čitalačke pismenosti, naučne pismenosti i matematičke pismenosti. Svi učenici uključeni u naš uzorak su ispunili upitnike i učestvovali u testiranju navedenih kompetencija. Postignuća iz matematičke, čitalačke i naučne pismenosti predstavljena su skaliranim vrednostima i analizirana kao zavisne varijable.

Tabela 1
Broj knjiga u kućnoj biblioteci (N = 620)

Broj knjiga	N	%
Nema knjiga	35	5.6
1 – 10 knjiga	87	14.0
11 – 25 knjiga	117	18.9
26 – 100 knjiga	199	32.1
101 – 200 knjiga	90	14.5
201 – 500 knjiga	57	9.2
Više od 500 knjiga	29	4.7
Bez odgovora	6	1

PISA učenički upitnik. Broj knjiga u kućnoj biblioteci korišćen je kao pokazatelj obrazovno-stimulativnog okruženja i analiziran kao medijator. Od ukupno 620 učenika, 614 učenika (99%) pružilo je validan odgovor na pitanje o broju knjiga kod kuće. Najveći procenat učenika (32.1%) naveo je da u njihovom domu postoji 26 – 100 knjiga, zatim je 18.9% navelo da poseduje 11 – 25 knjiga, dok se 14% izjasnilo da kod kuće ima 1 – 10 knjiga. Da nema nijednu knjigu, izjavilo je 5.6% učenika, dok je samo 4.7% navelo da ima više od 500 knjiga u svojoj kućnoj biblioteci. Raspodela odgovora ukazuje na to da većina učenika dolazi iz porodičnog okruženja sa umerenim brojem knjiga (između 11 i 100 knjiga čini 51.3% uzorka), što može ukazivati na srednji nivo dostupnosti kulturnih i obrazovnih resursa u okviru porodice.

Tabela 2
Stepen obrazovanja majke (N = 620)

Nivo obrazovanja	N	%
Bez osnovnog obrazovanja	1	0.2
ISCED 1 (nepotpuno osnovno obrazovanje)	2	0.3
ISCED 2 (potpuno osnovno obrazovanje)	40	6.5
ISCED 3.3 (gimnazija)	45	7.3
ISCED 3.4 (srednje stručno obrazovanje)	134	21.6
ISCED 4	44	7.1
ISCED 5 (više obrazovanje)	126	20.3
ISCED 6 (visoko obrazovanje)	109	17.6
ISCED 7 (master studije)	53	8.5
ISCED 8 (doktorske studije)	58	9.4
Bez odgovora	8	1.3

Tabela 3
Stepen obrazovanja oca (N = 620)

Nivo obrazovanja	N	%
Bez osnovnog obrazovanja	1	0.2
ISCED 1 (nepotpuno osnovno obrazovanje)	3	0.5
ISCED 2 (potpuno osnovno obrazovanje)	28	4.5
ISCED 3.3 (gimnazija)	83	13.4
ISCED 3.4 (srednje stručno obrazovanje)	134	21.6
ISCED 4	57	9.2
ISCED 5 (više obrazovanje)	116	18.7
ISCED 6 (visoko obrazovanje)	87	14
ISCED 7 (master studije)	46	7.4
ISCED 8 (doktorske studije)	52	8.4
Bez odgovora	13	2.1

Obrazovni nivo roditelja klasifikovan je prema ISCED skali i tretiran kao egzogena varijabla. Validne odgovore na pitanje o obrazovanju majke dalo je 612 učenika (98.7%). Najčešće prijavljeni nivo obrazovanja majke je ISCED 3.4 (21.6%), što odgovara završetku srednje škole sa mogućnošću prelaska na više obrazovanje. Slede ga ISCED 5 (20.3%)

i ISCED 6 (17.6%), koji označavaju više obrazovanje i visokoškolske kvalifikacije. Zbirno posmatrano, više od polovine majki (55.8%) ima obrazovanje ISCED nivoa 5 ili višeg, što ukazuje na relativno visok obrazovni status majki u uzorku. Podaci o obrazovanju oca bili su dostupni za 607 učenika (97.9%). Najzastupljeniji nivo obrazovanja je takođe ISCED 3.4 (21.6%), dok slede ISCED 5 (18.7%) i ISCED 6 (14%). Ukupno, 48.5% očeva ima obrazovanje ISCED 5 ili više, što je nešto niže u poređenju sa majkama, ali i dalje ukazuje na značajan udeo visokoobrazovanih roditelja u uzorku.

Analiza podataka

Podaci korišćeni u ovom istraživanju analizirani su primenom tehnike modelovanja strukturnih jednačina, zasnovane na parcijalnim najmanjim kvadratima (PLS-SEM), koja omogućava ispitivanje složenih odnosa između latentnih varijabli. Statistička obrada sprovedena je uz korišćenje softvera *SmartPLS4*, a analizirani model uključivao je dve egzogene latentne varijable (obrazovanje majke i obrazovanje oca), jednu medijatorsku varijablu (broj knjiga u kućnoj biblioteci) i tri endogene varijable (postignuća iz čitalačke, matematičke i naučne pismenosti).

Strukturni model je procenjen na osnovu standardizovanih koeficijenata putanja, pri čemu su testirane direktne i indirektne veze između varijabli. Za proveru značajnosti efekata korišćena je "bootstrap" procedura sa 5000 replikacija, čime su dobijene t-vrednosti i p-vrednosti za procenu statističke značajnosti putanja. Evaluacija kvaliteta modela vršena je na osnovu vrednosti koeficijenata determinacije (R^2), koji predstavljaju procenat objašnjene varijanse za svaku zavisnu varijablu. U skladu sa preporukama u literaturi, vrednosti R^2 od .75, .50 i .25 mogu se tumačiti kao visoke, umerene i niske (Hair et al., 2011).

Posebna pažnja posvećena je ispitivanju medijatorskih efekata broja knjiga u domaćinstvu, kako bi se utvrdilo da li i u kojoj meri obrazovni nivo roditelja utiče na obrazovna postignuća učenika posredno preko dostupnosti kulturnih i obrazovnih resursa u kućnom okruženju. Na osnovu ukupnih i specifičnih indirektnih efekata, procenjena je statistička značajnost medijacije, uz interpretaciju efekata u skladu sa savremenim standardima za PLS modeliranje. S obzirom na to da je istraživanje fokusirano na prediktivne odnose, a ne na potvrdu teorijskih modela, PLS-SEM pristup je ocenjen kao metodološki prikladan.

Rezultati

Rezultati parcijalnog najmanjeg kvadrata (PLS-SEM) strukturnog modelovanja ukazuju na statistički značajne odnose između obrazovanja roditelja, broja knjiga u kućnoj biblioteci i postignuća učenika u oblastima čitalačke, matematičke i naučne pismenosti.

Analiza direktnih efekata pokazuje da broj knjiga u kućnoj biblioteci ima snažan pozitivan uticaj na sve tri dimenzije pismenosti: na matematičku pismenost (β=.295, p <.001), na čitalačku pismenost (β=.302, p<.001) i na naučnu pismenost (β=.287, p <.001). Rezultati ukazuju da učenici koji imaju veći broj knjiga kod kuće ostvaruju viša postignuća na PISA testovima.

Obrazovanje roditelja ima značajan uticaj na broj knjiga u kućnoj biblioteci. Obrazovanje oca (FISCED) pokazuje jači efekat (β=.168, p<.001) u poređenju sa obrazovanjem majke (MISCED; β=.126, p=.004). Navedeni rezultati ukazuju da viši nivo obrazovanja roditelja doprinosi većoj dostupnosti kulturnih i obrazovnih resursa u porodičnom okruženju.

Posmatrano kroz indirektne efekte, nalazi pokazuju da broj knjiga u kućnoj biblioteci ima značajnu medijatorsku ulogu u odnosu između obrazovanja roditelja i obrazovnih postignuća učenika. Oba roditelja imaju statistički značajne indirektne efekte na sve tri oblasti pismenosti. Obrazovanje oca posredno utiče na matematičku pismenost (β=.050, p=.001), čitalačku pismenost (β=.051, p<.001) i naučnu pismenost (β=.048, p=.001), dok obrazovanje majke ima nešto slabije, ali takođe značajne posredne efekte: matematička (β=.037, p=.009), čitalačka (β=.038, p=.009), i naučna pismenost (β =.036, p=.009).

Vrednosti koeficijenta determinacije (R^2) ukazuju na to da model objašnjava relativno mali procenat varijanse posmatranih zavisnih varijabli: 6.6% za broj knjiga, 8.7% za matematičku pismenost, 9.1% za čitalačku i 8.3% za naučnu pismenost, što sugeriše da postoje i drugi faktori koji dodatno utiču na postignuća učenika, a koji nisu obuhvaćeni ovim modelom.

Zaključno, rezultati ukazuju na postojanje značajnog mehanizma putem kojeg obrazovni nivo roditelja, posredno preko broja knjiga u kućnoj biblioteci, utiče na nivo razvijenosti funkcionalnih oblika pismenosti kod učenika u uzrastu od 15 godina.

Tabela 4

Strukturne putanje i medijatorski efekti u PLS modelu

Veza	β koeficijent	*t*-vrednost	*p*-vrednost
Direktni efekti			
BK → MP	.295	7.65	< .001
BK → ČP	.302	7.59	< .001
BK → NP	.287	7.36	< .001
OO → BK	.168	3.88	< .001
OM → BK	.126	2.86	.004
Indirektni efekti (medijacija)			
OO → MP	.050	3.48	.001
OO → ČP	.051	3.53	<.001
OO → NP	.048	3.46	.001
OM → MP	.037	2.62	.009
OM → ČP	.038	2.63	.009
OM → NP	.036	2.63	.009

Napomena. *BK* – Broj knjiga u domaćinstvu, *MP* – matematička pismenost, *ČP* – čitalačka pismenost, *NP* – naučna pismenost, *OO* – nivo obrazovanja oca, *OM* – nivo obrazovanja majke.

Diskusija

Sprovedeno empirijsko istraživanje imalo je za cilj da ispita povezanost kućne biblioteke sa obrazovnim postignućima učenika u Srbiji. Broj knjiga u kućnoj biblioteci postavljen je kao medijatorska varijabla u odnosu između nivoa formalnog obrazovanja roditelja i postignuća učenika na PISA testiranju.

Iako rezulati daju relativno niske vrednosti R^2, oni pokazuju da broj knjiga u kućnoj biblioteci ima statistički značajan i relativno ujednačen pozitivan efekat na sva tri domena pismenosti – čitalačku, matematičku i naučnu pismenost. Ovaj nalaz je u skladu sa prethodnim istraživanjima, koja ukazuju da kućna biblioteka ne predstavlja samo resurs specifičan za određenu školsku oblast, već se poima kao opšti indikator kulturnog okruženja koje podstiče razvoj kognitivnih sposobnosti, kao i akademskih veština relevantnih za različite tipove obrazovnih zadataka (Evans et al., 2010; Evans et al., 2014; Sikora, 2019). U tom smislu, rezultati potvrđuju značaj teorije kulture učenja, budući da se u okviru ove teorije opisuju mehanizmi putem kojih knjige utiču na razvoj čitalačkih navika, kao i pozitivnih stavova prema učenju i sticanju znanja na mikronivou analize.

Međutim, te mehanizme je moguće kontekstualizovati kroz Burdijeov teorijski model, jer se njime objašnjava da se kulturne prakse različitih društvenih slojeva različito vrednuju od strane obrazovnog sistema. Burdijeov koncept kulturnog kapitala doprinosi razumevanju dubinski ukorenjenih odnosa moći, zbog kojih škole prepoznaju upravo one kulturne forme karakteristične za obrazovanije slojeve kao legitimne, omogućavajući deci koja potiču iz takvih porodica da lakše konvertuju svoje kulturne resurse u školski uspeh.

S tim u vezi, daljim uvidom u rezultate istraživanja utvrđeni su značajni efekti obrazovanja oba roditelja na broj knjiga u domaćinstvu, što, u skladu sa Burdijeovom teorijom, ukazuje na snažnu povezanost između institucionalizovanog i opredmećenog oblika kulturnog kapitala (Bourdieu, 1986). Nalaz da je efekat obrazovanja oca nešto izraženiji u odnosu na obrazovanje majke može se interpretirati u svetlu generacijskih razlika u obrazovnim putanjama roditelja. Ipak, s obzirom na to da je vršena sekundarna analiza studije, u kojoj nisu prisutni direktni indikatori rodnih uloga u porodičnim obrazovnim praksama, ovaj nalaz treba tumačiti oprezno. Važno je naglasiti da su rezultati pokazali da oba roditelja imaju statistički značajne indirektne efekte na sva tri domena pismenosti, što implicira zajednički doprinos porodičnog kulturnog okruženja obrazovnim ishodima učenika. Iako su razlike u efektima koje obrazovanje roditelja ima na različite domene pismenosti veoma male, primećuje se da i obrazovanje majke i obrazovanje oca indirektno najviše utiču na čitalačku pismenost učenika.

Posebno značajan nalaz odnosi se na medijatorsku ulogu broja knjiga u kućnoj biblioteci u odnosu između nivoa formalnog obrazovanja roditelja i PISA postignuća učenika. Ovi rezultati ukazuju na to da uticaj roditeljskog obrazovanja na obrazovne ishode nije neposredan, već se ostvaruje putem posrednih mehanizama koji oblikuju svakodnevno okruženje u kome deca odrastaju. Kroz teorijsku sintezu teorije kulture učenja i teorije kulturnog kapitala, u našem istraživanju nismo posmatrali kućnu biblio-

teku ni isključivo kao jedan od indikatora kulturnog kapitala, ni kao izolovani obrazovni resurs, već kao strukturno pozicioniranu kulturnu praksu. Možemo zaključiti da njena medijatorska uloga doprinosi uvidu u način na koji se kultura učenja ukršta sa mehanizmima kulturne reprodukcije.

Iako su vrednosti R^2 relativno niske, one su u skladu sa nalazima prethodnih PISA studija i ukazuju da kućna biblioteka predstavlja jedan od relevantnih, ali ne i isključivih mehanizama koji doprinose razvoju učeničkih kompetencija. Ovakvi rezultati potvrđuju da su funkcionalne pismenosti koje PISA meri proizvod složenih i dugotrajnih procesa socijalizacije za kulturne prakse, u okviru kojih nijedan pojedinačni faktor ne može imati dominantan uzročni uticaj.

Relativno nizak procenat objašnjene varijanse ukazuje na ograničenja redukcionističkih interpretacija efekata kućne biblioteke. Umesto da se tumači kao slabost modela, ovaj nalaz je u skladu sa teorijskim okvirom kulturne reprodukcije, koji naglašava da se obrazovne nejednakosti proizvode kroz interakciju različitih oblika kapitala – kulturnog, ekonomskog, socijalnog i simboličkog – tokom dužeg vremenskog perioda. U tom smislu, iako je broj knjiga u domu analitički značajan, on predstavlja samo jedan od segmenata u okviru šire strukture oblikovane nejednakim obrazovnim šansama. Rezultati našeg istraživanja ukazuju na relevantnost ispitivanog indikatora ukoliko se on posmatra kao „vrh ledenog brega" složenih društvenih procesa. Smatramo da se upravo u tome nalazi analitička snaga varijable broja knjiga – ne u njenoj prediktivnoj moći, već u njenim mogućnostima da strukturalno skrivene mehanizme reprodukcije učini empirijski vidljivim.

Konačno, dobijeni rezultati imaju određene implikacije za interpretaciju PISA nalaza u javnom i političkom diskursu. Oni ukazuju da se obrazovne razlike merene PISA testiranjem ne mogu adekvatno objasniti niti ublažiti intervencijama usmerenim isključivo na materijalne aspekte porodičnog okruženja. Umesto toga, rezultati ovog istraživanja podstiču na razmatranje širih strukturnih uslova, u kojima se kulturni resursi stiču i vrednuju, te posreduju kroz porodične i školske prakse koje ih prevode u forme znanja prepoznate i nagrađivane u obrazovnom sistemu. Time se kućna biblioteka ne pozicionira kao jednostavan instrument politike, već kao pokazatelj dubljih mehanizama kulturne i obrazovne reprodukcije u savremenom srpskom društvu.

Zaključak

Rezultati PISA studija otvaraju prostor za koncipiranje implikacija za obrazovne i kulturne politike. Nalazi našeg istraživanja doprineli su potvrdi prethodnih empirijskih istraživanja, koja ukazuju na stabilnu povezanost između broja knjiga u domu i obrazovnih postignuća. Međutim, pri formiranju preporuka za obrazovne politike, potreban je oprez pri interpretaciji rezultata. Dobijeni nalazi ne mogu biti redukovani na pojednostavljenu normativnu poruku, koja bi pretpostavljala da povećanje dostupnosti knjiga automatski vodi ka smanjenju obrazovnih nejednakosti.

PISA studije ispituju kompetencije učenika kao meru funkcionalnih oblika pismenosti, međutim, razvoj tih kompetencija je duboko ukorenjen u dugotrajnim procesima socijalizacije za kulturne prakse, te se one ne mogu značajno unaprediti kratkoročnim intervencijama usmerenim isključivo na materijalne resurse. Kada se PISA rezultati tumače kroz prizmu jednostavnih uzročnih veza između posedovanja knjiga u kućnoj biblioteci i učeničkih postignuća dovodi do depolitizacije strukturnih nejednakosti, jer fokus pomera sa društvenih uslova proizvodnje obrazovnih razlika na individualne i porodične „nedostatke". Ovo, naravno, nikako ne implicira da su intervencije usmerene na poboljšanje materijalnih uslova učenika irelevantne (Štrangarić i sar., 2017), posebno uvažavajući koncept kulturne adaptacije, u kojoj se naglašava fleksibilnost kulturnih praksi (Cvetičanin, 2007), i kumulativan karakter prisvajanja kulturnog kapitala (Aschaffenburg & Mass, 1997). Ipak, ovakve intervencije, iako potrebne, nisu dovoljne ukoliko nisu praćene širim institucionalnim i kulturnim promenama.

U tom smislu, analitička vrednost varijable broja knjiga u kućnoj biblioteci ne leži u njenom policy-potencijalu kao instrumenta intervencije, već u njenoj sposobnosti da ukaže na dublje, strukturno ukorenjene mehanizme kulturne i obrazovne reprodukcije. Umesto da se tumači kao sredstvo jednostavnog „popravljanja"obrazovnih ishoda, ova varijabla treba da bude shvaćena kao indikator nejednakih startnih pozicija koje obrazovni sistem, uključujući i sisteme eksterne evaluacije poput PISA, često potvrđuje.

Posmatrano na taj način, medijatorska uloga broja knjiga, u odnosu između obrazovnog nivoa roditelja i PISA kompetencija učenika, ne predstavlja dokaz direktnog pedagoškog efekta knjiga, već empirijsku artikulaciju mehanizma kulturne reprodukcije. Posedovanje knjiga u kućnoj biblioteci označeno je kao materijalna tačka preseka institucionalizovanog kulturnog kapitala roditelja i dispozicija dece, dok obrazovni sistem, kroz PISA merne instrumente, vrednuje upravo one kompetencije koje su u takvom okruženju najlakše razvijene.

Nalaze ovog istraživanja potrebno je tumačiti u svetlu nekoliko metodoloških ograničenja. Najpre, analiza je zasnovana na sekundarnim podacima PISA studije, što podrazumeva ograničenu kontrolu nad izborom i operacionalizacijom varijabli. Iako su korišćeni indikatori standardizovani i međunarodno validirani, oni neminovno redukuju složene društvene i kulturne procese koji se nalaze u osnovi obrazovnih nejednakosti. Zatim, broj knjiga u kućnoj biblioteci korišćen je kao proksi indikator kulturnog kapitala u njegovom opredmećenom obliku, koji, kao takav, ne definiše načine na koje se knjige koriste u svakodnevnim porodičnim praksama. S tim u vezi, oslanjanje na samoprocenu učenika može uvesti određeni stepen greške, s obzirom na to da su istraživanja pokazala da učenici sa višim postignućima preciznije procenjuju broj knjiga u domaćinstvu (Eriksson et al., 2022). Takođe, potrebno je naglasiti da utvrđene povezanosti treba tumačiti kao obrasce strukturalne uslovljenosti, a ne kao direktne uzročne mehanizme.

Naposletku, iako je uzorak reprezentativan za učenike uzrasta od 15 godina u Srbiji, rezultati se ne mogu automatski generalizovati na druge uzraste, obrazovne nivoe ili nacionalne kontekste bez dodatnih empirijskih provera.

Preporuke za dalja istraživanja podrazumevaju uključivanje varijabli koje bi obuhvatile porodične obrazovne prakse, roditeljske aspiracije i simboličke orijentacije ka obrazovanju. Od posebnog značaja bili bi longitudinalni dizajni studija, koji bi omogućili preciznije ispitivanje mehanizama kulturne i obrazovne reprodukcije, kroz konkretne životne putanje. Iako je kvantitativna metodološka orijentacija adekvatna za istraživanje na velikim uzorcima ispitanika i pogodna za primenu komparativnog pristupa, uključivanje kvalitativnih metoda omogućilo bi dubinsko razumevanje značaja posedovanja knjiga u okviru kućnih biblioteka, takođe i osvetlilo načine na koje se kulturni resursi oblikuju u forme znanja, obrazovnih orijentacija i aspiracija koje obrazovni sistem prepoznaje i vrednuje.

Literatura

Addido, J., Katende, S., Namakula, E.K., & Ogundapo, T.J. (2025). The role of students' home educational resources and parents' level of education in science achievement: Using TIMSS data for Egypt, Morocco, and South Africa. *International Journal of Research in Education and Science, 11*(1), 91-109. https://doi.org/10.46328/ijres.3582

Aschaffenburg, K., & Maas, I. (1997). Cultural and Educational Careers: The Dynamics of Social Reproduction. *American Sociological Review, 62*(4), 573-587. https://doi.org/10.2307/2657427

Avvisati, F. (2020). The measure of socio-economic status in PISA: a review and some suggested improvements. *Large-scale Assess Educ, 8*(8), 1-37. https://doi.org/10.1186/s40536-020-00086-x

Bourdieu, P. (1973). Cultural Reproduction and Social Reproduction. In R. Brown (Ed.), *Knowledge, Education and Cultural Change* (pp. 71-112). Tavistock.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of Theory and Research for Sociology of Education* (pp. 241-258). Greenwood.

Breznau, N., Sauter, L., & Salikutluk, Z. (2019). Full Shelves, Good Skills? Immigration, Adolescent Language Aptitude and New Evidence on Books in the Home from Four European Countries. *Comparative Sociology*, *19*(4-5), 465-508. https://doi.org/10.1163/15691330-BJA10019

Brunarska, Z., & Ivlevs, A. (2025). Does exposure to books foster a taste for spatial mobility? Home library size in childhood and adult migration intentions. *Migration Studies*, *13*(2), 1-20. https://doi.org/10.1093/migration/mnae011

Burdije, P. (2012). Klasni ukusi i životni stilovi. U J. Đorđević (pr.), *Studije kulture – zbornik* (str. 155-177). Službeni glasnik.

Burdije, P., i Paseron, Ž. K. (2014). *Reprodukcija. Elementi za jednu teoriju obrazovnog sistema*. Fabrika knjiga.

Burdije, P. (2023). *Isticanje razlike: Društvena kritika moći suđenja*. Karpos.

Chiu, M. M., & Chow, B. W. Y. (2010). Culture, motivation, and reading achievement: High school students in 41 countries. *Learning and Individual Differences, 20*(6), 579-592. https://doi.org/10.1016/j.lindif.2010.03.007

Cvetičanin, P. (2007). *Kulturne potrebe, navike i ukus građana Srbije i Makedonije*. Odbor za građansku inicijativu.

da Col, G. (2015). Tsundoku. *HAU: Journal of Ethnographic Theory*, *5*(2), i-iii. https://doi.org/10.14318/hau5.2.001

Engzell, P. (2018). What do books in the home proxy for? A cautionary tale. *Sociological Methods & Research, 50*(4), 1487–1514. https://doi.org/10.1177/0049124119826143

Eriksson, K., Lindvall, J., Helenius. O., & Ryve, A. (2022). Higher-achieving children are better at estimating the number of books at home: Evidence and implications. *Frontiers in Psychology, 13*, 1-10. https://doi.org/10.3389/fpsyg.2022.1026387

Evans, M. D. R., Kelley, J., Sikora, J., & Treiman, D. J. (2010). Family Scholarly Culture and Educational Success: Books and Schooling in 27 nations. *Research in Social Stratification and Mobility, 28*(2), 171-197. https://doi.org/10.1016/j.rssm.2010.01.002

Evans, M. D. R., Kelley, J., & Sikora, J. (2014). Scholarly Culture and Academic Performance in 42 Nations. *Social Forces, 92*(4), 1573-1605. https://doi.org/10.1093/sf/sou030

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139-152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage Publications.

Heppt, B., Olczyk, M., & Volodina, A. (2022). Number of books at home as an indicator of socioeconomic status: examining its extensions and their incremental validity for academic achievement. *Social Psychology of Education, 25*, 903–928. https://doi.org/10.1007/s11218-022-09704-8

Karijer, Ž. K. i Eko, U. (2011). *Ne nadajte se da ćete se rešiti knjiga.* Gradac.

Marić, M., Rodić Lukić, V., i Štrangarić, S. (2018). Model uticaja kulturnog kapitala i individualnih motivacionih činilaca na ključne kompetencije učenika. *Primenjena psihologija, 11*(1), 9-26. https://doi.org/10.19090/pp.2018.1.9-26

Phillips, A., & Kovač, M. (2022). *Is this a book*?. Cambridge University Press. https://doi.org/10.1017/9781108938389

Radulović, M., Vesić, D., & Malinić, D. (2020). Cultural Capital and Student's Achievement: The Mediating Role of Self-efficacy. *Sociologija, 62*(2), 255-268. https://doi.org/10.2298/SOC2002255R

Rodger, N. (2018). From Book To Bookish: Repurposing the Book in the Digital Era. *Intersectionalities and Media Archaeologies, 7*(1), 1-33. https://doi.org/10.7275/511e-2k72

Rodić Lukić, V., Marić, M., & Štrangarić, S. (2020). Relational Impact of Cultural Capital and the Perception of Self-efficacy on Educational Achievement. *Teme, 44*(4), 1261-1274. https://doi.org/10.22190/TEME190321077R

Sikora, J., Evans, M. D. R., & Kelley, J. (2019). Scholarly culture: How books in adolescence enhance adult literacy, numeracy and technology skills in 31 societies. *Social Science Research, 77*, 1-15. https://doi.org/10.1016/j.ssresearch.2018.10.003

Štrangarić, S., Rodić Lukić, V., i Marić, M. (2017). Efekti kulturnog kapitala na obrazovna postignuća učenika – sekundarna analiza PISA studije. *Nastava i vaspitanje, 66*(2), 207-219. https://doi.org/10.5937/nasvas1702207S

Štrangarić, S. (2022). Uloga medija u akumulaciji kulturnog kapitala i reprodukciji društvenih nejednakosti. U S. Štrangarić, M. Cvijetić, i M. Šumonja (Ur.). *Digitalni mediji, kultura i obrazovanje: konteksti, značenja i primena – zbornik radova* (str. 169-181). Pedagoški fakultet.

Štrangarić, S. i Rodić Lukić, V. (2024). Model uticaja kulturnog kapitala i obrazovnog habitusa na PISA kompetencije učenika: primer Srbije i Hrvatske. *Sociologija*, *66*(1), 28-44. https://doi.org/10.2298/SOC2401028S

Thumala Olave, M.A. (2020). Book love. A cultural sociological interpretation of the attachment to books. *Poetics*, *81*, 1-11. https://doi.org/10.1016/j.poetic.2020.101440

Volodina, A. (2025). Books at home or own books? Relations between the number of books, cognitive and socio-emotional outcomes in secondary school students. *European Journal of Psychology of Education, 40*, Article 9. https://doi.org/10.1007/s10212-024-00919-1

Primljeno: 11.02.2026.
Korigovana verzija primljena: 06.04.2026.
Prihvaćeno za štampu: 27.04.2026.

Snežana Štrangarić
Pedagoški fakultet u Somboru, Univerzitet u Novom Sadu, Sombor, Srbija
https://orcid.org/0000-0002-8131-5164

Vesna Rodić Lukić
Pedagoški fakultet u Somboru, Univerzitet u Novom Sadu, Sombor, Srbija
https://orcid.org/0000-0003-0345-3606

Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Nastava i vaspitanje, 2026, *75*(2), 339-353
https://doi.org/10.5937/niv75-62148

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Povezanost liderskih veština i akademskog postignuća studenata pedagogije: implikacije za razvoj kurikuluma

Milena Letić Lungulov[1]
Odsek za pedagogiju, Filozofski fakultet,
Univerzitet u Novom Sadu, Novi Sad, Srbija

Jovana Turudić
Odsek za pedagogiju, Filozofski fakultet,
Univerzitet u Novom Sadu, Novi Sad, Srbija

Saška Radujkov
Odsek za pedagogiju, Filozofski fakultet,
Univerzitet u Novom Sadu, Novi Sad, Srbija

Apstrakt *Cilj ovog istraživanja je ispitivanje relacija između liderskih veština i akademskog uspeha kod studenata pedagogije, s namerom da se identifikuju strategije za razvoj liderstva u okviru programa inicijalnog obrazovanja budućih pedagoga. Dodatno, ispituju se razlike u razvijenosti liderskih veština između studenata različitih godina studija kako bi se utvrdio potencijalni uticaj akademskog napredovanja na ove veštine. Uzorak čini 194 studenta pedagogije sa Filozofskog fakulteta Univerziteta u Novom Sadu. Liderske veštine u osam domena (organizacija i planiranje, svest o različitostima, samoupravljanje, samopouzdanje, upotreba tehnologija, kognitivni razvoj i kritička analiza, interpersonalna komunikacija, rešavanje problema i donošenje odluka) procenjene su adaptiranom verzijom inventara ishoda studentskog liderstva, dok je akademsko postignuće mereno prosečnom ocenom na studijama. Rezultati Pirsonovog koeficijenta korelacije pokazuju značajnu povezanost akademskog postignuća sa ukupnim skorom na inventaru ishoda studentskog liderstva, kao i sa specifičnim domenima – organizacija i planiranje, svest o različitostima, samoupravljanje i samopouzdanje. Razlike u razvijenosti liderskih veština u zavisnosti od godine studija nisu pokazale statističku značajnost. Na osnovu dobijenih rezultata, predložene su intervencije za unapređenje liderskih veština kroz kurikulum studija pedagogije. Istraživanje pruža doprinos razumevanju odnosa između liderskih veština i akademskog postignuća, otvarajući prostor za dalja istraživanja i praktičnu primenu u kontekstu obrazovanja i profesionalnog razvoja budućih pedagoga.*

Ključne reči: *akademsko postignuće, liderske veštine, pedagogija, razvoj kurikuluma.*

1 milenaletic@ff.uns.ac.rs

Uvod

Liderstvo je neizostavan činilac u društvenom i profesionalnom kontekstu, a njegova univerzalna funkcija prepoznata je još početkom 20. veka. To potvrđuje i Mumford (Mumford, 1906) koji ističe da liderstvo prožima sve oblike udruživanja, od najjednostavnijih zajednica do najsloženijih organizacija, čime se naglašava njegova sveprisutnost i značaj. Univerzalnost liderstva prisutna je i u shvatanjima savremenih autora (Northouse, 2021; Yukl & Gardner, 2020) koji naglašavaju njegovu ključnu ulogu u profesionalnom razvoju pojedinaca i unapređenju organizacione efikasnosti. U današnjem društvu, koje karakterišu ubrzane promene i potreba za adaptacijom, poslodavci sve češće prepoznaju liderske veštine kao ključne determinante konkurentnosti pojedinaca na tržištu rada (Cottrell, 2021). S tim u vezi, sve veći broj istraživanja ukazuje na značaj i potrebu za razvojem liderskih veština kroz formalne obrazovne programe, kako bi se omogućilo uspešno integrisanje mladih u dinamično profesionalno okruženje (Dugan et al., 2009; Elmuti et al., 2005; Kezar et al., 2006). Uprkos tome, formalno obrazovanje i dalje ne pruža doslednu i sistematsku integraciju liderstva (Cottrell, 2021). Pojedini autori primećuju da liderstvo postaje sve prisutnije u visokoškolskim programima, ali da se često tretira kao dodatak kurikulumu, a ne kao njegov sastavni deo (Elmuti et al., 2005). Ovakav pristup dovodi do nesistematičnog razvoja liderskih veština, što može umanjiti njihovu primenjivost u profesionalnom kontekstu (Dugan, 2024).

Pitanje razvoja liderskih veština kroz formalno obrazovanje je naročito značajno u profesijama koje podrazumevaju visoku odgovornost i interakciju sa različitim akterima, među kojima profesija pedagoga zauzima važno mesto. S obzirom na to da pedagog ima ključnu ulogu u oblikovanju vaspitno-obrazovnog procesa, njegovo liderstvo nije samo stvar lične kompetencije, već faktor koji utiče na širu obrazovnu zajednicu. U tom kontekstu, neophodno je preispitati kako se razvoj liderskih veština može sistematski integrisati u formalno obrazovanje budućih pedagoga.

Savremene teorije naglašavaju da liderstvo nije isključivo vezano za formalne pozicije moći, već da uključuje niz interpersonalnih karakteristika i etičkih vrednosti (Brown et al., 2005; Tannenbaum et al., 2013). Shodno tome, autorka Van (Vann, 2000), čiji je koncept liderstva poslužio kao teorijski okvir ovog rada, posmatra liderstvo kao dinamičan i višedimenzionalan proces razvoja ličnih i profesionalnih kapaciteta studenata. Ovaj model podrazumeva razvijanje niza međusobno povezanih karakteristika: svesti o različitostima, samopouzdanja, interpersonalne komunikacije, organizacije i planiranja, samoupravljanja, kritičkog mišljenja, rešavanja problema i donošenja odluka, kao i osposobljenosti za upotrebu savremenih tehnologija. Prema Van (Vann, 2000), liderske veštine se posmatraju kao potencijali koji se mogu oblikovati kroz iskustvo i obrazovne programe. Takvo shvatanje odgovara savremenim pedagoškim tendencijama, koje teže razvoju celovite ličnosti – lidera koji promišlja, komunicira i deluje odgovorno u složenim društvenim kontekstima. U odnosu na dominantne modele liderstva, poput transformacionog ili transakcionog, koji su prevashodno usmereni na ulogu lidera u organizacionom kontekstu i njegov uticaj

na sledbenike (Northouse, 2021), model autorke Van je posebno pogodan za obrazovni kontekst, jer polazi od razvojnih potencijala studenata kao budućih profesionalaca. Za razliku od distribuiranog liderstva, koje naglasak stavlja na raspodelu liderskih uloga unutar sistema (Spillane, 2006), Van se fokusira na unutrašnji razvoj pojedinca i sticanje veština relevantnih za akademski i profesionalni uspeh (Vann, 2000). Upravo ova razvojna orijentacija i funkcionalnost u kontekstu visokog obrazovanja predstavljaju ključni razlog izbora pomenutog modela kao teorijskog okvira istraživanja.

Značaj liderskih veština za profesiju pedagoga ogleda se u njihovoj neposrednoj povezanosti sa kvalitetom stručnog delovanja i sposobnošću za koordinaciju složenog vaspitno-obrazovnog procesa. Kako pojedini autori ističu (Brown et al., 2005), etička dimenzija liderstva podrazumeva odgovorno donošenje odluka i usklađivanje ličnih vrednosti sa profesionalnim normama, što je od posebnog značaja u radu pedagoga. Savremeni pedagog deluje ne samo kao stručni savetnik, već i kao lider koji utiče na razvoj odnosa i organizacionu kulturu u školi (Tannenbaum et al., 2013). Pored teorijskog i metodičkog znanja, pedagog mora posedovati razvijene veštine samoupravljanja, komunikacije i planiranja, jer one omogućavaju efikasno usmeravanje drugih, kao i unapređivanje kvaliteta vaspitno-obrazovnog procesa (Harris & Jones, 2019). Posebno su značajne veštine koje se odnose na rešavanje problema, kritičko promišljanje i uvažavanje različitosti, jer one omogućavaju konstruktivno reagovanje u složenim i nepredvidivim situacijama (Komives et al., 2013). U tom smislu, liderske veštine predstavljaju pokazatelj profesionalne zrelosti i spremnosti za samostalno i odgovorno delovanje u praksi. Van (Vann, 2000) naglašava da se one razvijaju kroz iskustvo, refleksiju i obrazovne programe, te da su merljive i podložne sistematskom unapređivanju.

Analiza načina na koji se ove veštine mogu razvijati tokom studija, kao i faktora koji na to utiču, od suštinskog je značaja za razumevanje kvaliteta obrazovanja budućih pedagoga. Odatle proizlazi potreba da se empirijski ispita njihova povezanost sa akademskim postignućem studenata pedagogije, što je osnovni cilj ovog rada. Dodatno, ispituju se razlike u razvijenosti liderskih veština u zavisnosti od godine studija. U tom kontekstu, ovo istraživanje je usmereno na davanje odgovora na pitanja da li su i u kojoj meri liderske veštine povezane sa akademskim uspehom studenata pedagogije, kao i da li i u kojoj meri akademsko napredovanje doprinosi njihovom razvoju? Na osnovu dobijenih rezultata i relevantne literature, teži se formulisanju preporuka za unapređenje kurikuluma koje bi mogle doprineti efikasnijem razvoju liderskih veština u okviru formalnog obrazovanja budućih pedagoga.

Pregled relevantnih istraživanja

Iako su istraživanja o liderskim veštinama studenata relativno retka, postoje studije koje naglašavaju njihovu važnost u kontekstu profesionalne pripreme. Jedno takvo istraživanje, sprovedeno među studentima socijalnog rada u Ukrajini, pokazalo je da studenti postdiplomskih studija poseduju viši nivo razvijenosti liderskih veština u poređenju sa stu-

dentima osnovnih studija (Horishna et al., 2019). Takođe, u istom istraživanju je utvrđeno da studenti koji su uključeni u dodatne nastavne aktivnosti i koji imaju radno iskustvo poseduju razvijenije liderske veštine u poređenju sa studentima koji nisu aktivno uključeni u vannastavne ili radne aktivnosti (Horishna et al., 2019). Ovi nalazi sugerišu da različiti oblici praktičnog angažmana mogu pozitivno uticati na razvoj liderskih veština kod studenata.

Dalje, istraživanja ukazuju na postojanje pozitivne veze između angažovanja učenika u liderskim ulogama i njihovog akademskog uspeha (Bakar et al., 2018; Cheong, 2020). Učestvovanje u liderskim ulogama doprinosi razvoju motivacije, odgovornosti i samopouzdanja, što se dalje odražava na bolje akademsko postignuće (Bakar et al., 2018; Baker & McCarthy, 2019). Samopouzdanje kao prediktor akademskog uspeha navodi se i u drugim studijama (Morony et al., 2013). Osim toga, studenti koji preuzimaju liderske uloge često uspostavljaju snažnije odnose sa nastavnicima i vršnjacima, čime ostvaruju lakši pristup dodatnoj podršci i resursima, što može doprineti njihovom uspehu u učenju (Cheong, 2020). Nalazi još jednog istraživanja (Abbas et al., 2024) ukazuju na to da angažovanje studenata u liderskim ulogama pozitivno utiče na njihov akademski uspeh. Studenti koji preuzimaju liderske odgovornosti pokazuju viši nivo razvijenosti veština koje su karakteristične za liderstvo, a koje se istovremeno identifikuju kao ključni prediktori akademskog postignuća, što uključuje upravljanje vremenom, efektivnu komunikaciju, kritičko mišljenje i timski rad(Abbas et al., 2024).

Slično tome, El Morabit (El Morabit, 2024) ističe da studenti koji zauzimaju liderske pozicije razvijaju izraženije veštine timskog rada, rešavanja problema i uspešne komunikacije, kao i veće samopouzdanje. Učešće u ovakvim aktivnostima doprinosi pozitivnoj dinamici među studentima, podstiče lični razvoj i ima povoljan uticaj na akademski uspeh. I drugi autori (Deng et al., 2020) navode da lidersko iskustvo studenata može unaprediti akademska postignuća, pri čemu se primećuje manji vremenski angažman u učenju, ali veći stepen autonomije i samostalnog upravljanja učenjem. Studenti sa izraženim liderskim karakteristikama imaju više samopouzdanja, istrajniji su i postižu bolje akademske rezultate. Preuzimanje liderskih uloga pruža studentima mogućnost da donose samostalne odluke, grade mreže i proširuju profesionalne odnose, što dodatno doprinosi doslednosti u studijama i istrajnosti u postizanju akademskih ciljeva.

Ipak, pojedina istraživanja ukazuju na drugačije nalaze. Istraživanje Pansakale i saradnika (Pansacala et al., 2024) nije pokazalo statistički značajnu vezu između liderstva i akademskog postignuća. Autori, međutim, naglašavaju da tip liderske pozicije i stepen odgovornosti koji ona podrazumeva mogu značajno uticati na akademski uspeh, što sugeriše da nije sama liderska uloga presudna, već se moraju uzeti u obzir i njen kvalitet i sadržaj. Slično tome, Čen (Chan, 2023) nije pronašao značajne razlike u akademskim performansama između studenata sa transformacionim, transakcionim i pasivno-izbegavajućim stilovima liderstva, što dodatno ukazuje na kompleksnost odnosa između liderskih karakteristika i akademskih ishoda. Dodatno, rezultati istraživanja Ganunija i Ramboarison-Lalao (Gannouni & Ramboarison-Lalao, 2016) ukazuju na mogućnost da, iako ne postoji direktna korelacija između liderstva i akademskih rezultata, učešće u liderskim aktiv-

nostima doprinese unutrašnjih psiholoških resursa, poput samopouzdanja i motivacije, koji studentima pružaju unutrašnju snagu da istraju, teže visokim ciljevima i uspešno ih ostvare, što posredno može uticati na akademski uspeh. Ovi nalazi naglašavaju da liderske uloge imaju značajan razvojni potencijal čak i kada ne dovode neposredno do poboljšanja akademskog postignuća.

Iako većina navedenih istraživanja ukazuje na postojanje pozitivne povezanosti između liderskih veština, liderskog angažovanja i akademskog postignuća studenata, nalazi u ovoj oblasti nisu u potpunosti jednoznačni. Dok pojedine studije naglašavaju direktan uticaj liderskih uloga i povezanih veština na akademski uspeh, druga istraživanja ukazuju na posrednu ulogu psiholoških resursa, ili pak na značaj konteksta, tipa liderske uloge i stepena odgovornosti koju ona podrazumeva. Ovakva nedoslednost rezultata ukazuje na složenost odnosa između liderskih veština i akademskog uspeha, kao i na potrebu za daljim empirijskim ispitivanjima u specifičnim obrazovnim kontekstima. Naročito je uočljiv nedostatak istraživanja usmerenih na studente pedagogije, kod kojih razvoj liderskih veština ima poseban značaj kako u kontekstu akademskog postignuća tako i u okviru pripreme za buduću profesionalnu ulogu. Upravo taj istraživački jaz predstavlja polazište i opravdanje za sprovođenje istraživanja prikazanog u ovom radu.

Metodološki okvir istraživanja

Cilj istraživanja

Cilj ovog istraživanja je da ispita povezanost liderskih veština i akademskog postignuća kod studenata pedagogije, s namerom da se pruži osnova za razvoj liderstva u okviru programa inicijalnog obrazovanja stručnih saradnika – pedagoga. Osim toga, pažnja se posvećuje i analizi razlika u razvijenosti liderskih veština kod studenata različitih godina studija, čime se ispituje uticaj akademskog napredovanja na ove veštine. Imajući u vidu polazne teorijske osnove istraživanja, pretpostavlja se da će rezultati ukazati na pozitivnu povezanost liderskih veština sa akademskim postignućem kod studenata pedagogije. Istovremeno, očekuje se da će studenti viših godina studija pokazati viši nivo razvijenosti liderskih veština, kao posledicu akumuliranog obrazovnog iskustva.

Varijable i instrumenti

Liderske veštine operacionalizovane su preko seta varijabli specifikovanih u okviru modifikovane verzije inventara ishoda studentskog liderstva (eng. *Student Leadership Outcomes Inventory* – SLOI) autorke Van (Vann, 2000). Reč je o osam varijabli koje se odnose na: svest o različitostima – razumevanje i uvažavanje kulturnih i socijalnih razlika; samopouzdanje – poverenje u sopstvene liderske sklonosti; interpersonalna komunikacija – veštine jasne i efikasne komunikacije sa drugima; organizacija i planiranje – veštine organizovanja zadataka i strateškog planiranja; samoupravljanje – veštine samoorganizacije i

samovođenja u složenim situacijama; kognitivni razvoj i kritička analiza – veštine kritičkog mišljenja i analize problema; rešavanje problema i donošenje odluka – efikasno rešavanje problema i donošenje strateških odluka; upotreba tehnologija – korišćenje savremenih tehnologija u liderstvu. Modifikacija instrumenta obuhvatila je jezičku i kulturološku adaptaciju, kao i redukciju broja stavki u odnosu na originalnu verziju instrumenta, pri čemu su zadržane ključne dimenzije i izvorna konceptualna struktura instrumenta (Letić Lungulov i Radujkov, 2024; Vann, 2000). Modifikovana verzija instrumenta konstruisana je kao skala Likertovog tipa, sačinjena od 30 stavki sa četiri nivoa slaganja sa svakom od njih. Zaokruživanjem određene numeričke vrednosti na skali, ispitanik procenjuje u kom se stepenu određena tvrdnja odnosi na njega (od 1 – uopšte se ne slažem do 4 – u potpunosti se slažem). Primenom eksplorativne faktorske analize (metod glavnih osa), proverena je latentna struktura inventara ishoda studentskog liderstva, pri čemu je potvrđenaosmofaktorska struktura upitnika kao u originalnom istraživanju (Vann, 2000) i utvrđene su dobra pouzdanost i validnost instrumenta. Kronbahova alfa instrumenta u celini iznosi .86, dok se pouzdanost pojedinačnih domena kreće u rasponu od .61 do .75 (Letić Lungulov i Radujkov, 2024).

Akademsko postignuće izraženo je prosečnom ocenom u periodu studiranja do trenutka realizacije istraživanja.

Godina studija obuhvata četiri kategorije – prva, druga, treća i četvrta.

Uzorak

U istraživanju je učestvovalo 194 ispitanika koji pohađaju studije pedagogije na Filozofskom fakultetu Univerziteta u Novom Sadu. Uzorak je bio prigodan i uključivao je studente osnovnih akademskih studija. Struktura uzorka, te njegova ujednačenost u pogledu relevantnih varijabli, vidljive su iz Tabele 1.

Tabela 1
Struktura uzorka

Varijable		Frekvencije	Procenat
Prosečna ocena	6.50 – 7.50	16	8.2
	7.50 – 8.50	91	46.9
	8.50 – 9.50	76	39.2
	> 9.50	11	5.7
Godina studija	Prva	49	25.2
	Druga	45	23.2
	Treća	50	25.8
	Četvrta	50	25.8
	Ukupno	194	100.0

Imajući u vidu da uzorak čine ispitanici sa samo jednog fakulteta u zemlji, dobijeni nalazi pre svega odražavaju karakteristike ove grupe, dok bi primenljivost rezultata na studente pedagogije sa drugih fakulteta mogla biti predmet budućih istraživanja.

Analizom etičkih aspekta istraživanja ustanovljeno je da ono ni na koji način ne narušava prava učesnika, niti odstupa od utvrđenih etičkih standarda. Tome u prilog govore podaci da je istraživanjem obuhvaćen relativno mali broj pitanja koja se tiču opštih karakteristika ispitanika, te da je učešće bilo potpuno dobrovoljno, uz mogućnost odustajanja u bilo kom momentu. Shodno tome, procenjeno je da istraživanje ne uključuje nikakav rizik po psihološko blagostanje ispitanika.

Rezultati istraživanja

Povezanost liderskih veština i akademskog postignuća

Kako bi se ispitala povezanost liderskih veština i akademskog postignuća ispitanika, primenjen je Pirsonov koeficijent linearne korelacije.

Tabela 2
Povezanost liderskih veština i akademskog postignuća

Skala		Prosek
Inventar ishoda studentskog liderstva	Ukupno	.17*
	Organizacija i planiranje	.18*
	Svest o različitostima	.15*
	Samoupravljanje	.15*
	Samopouzdanje	.15*
	Upotreba tehnologija	.01
	Kognitivni razvoj i kritička analiza	.07
	Interpersonalna komunikacija	.12
	Rešavanje problema i donošenje odluka	.05

*Napomena. ***p < .001, **p < .01, *p < .05*

Kao što se vidi iz Tabele 2, prosečna ocena studenata je u značajnoj pozitivnoj korelaciji sa ukupnim skorom na inventaru ishoda studentskog liderstva, kao i sa prve četiri subskale: organizacija i planiranje, svest o različitostima, samoupravljanje i samopouzdanje. Korelacije su niskog intenziteta i pozitivnog smera, što ukazuje na to da veći rezultati na jednoj varijabli prate veće vrednosti na drugoj. Drugim rečima, ispitanici koji imaju viši prosek ocena imaju i razvijenije liderske veštine u pomenutim domenima. Iako su ove korelcije statistički značajne, njihov nizak intenzitet ukazuje na ograničen praktični značaj

efekta, što implicira da se akademski uspeh studenata istovremeno oblikuje pod uticajem šireg skupa individualnih i kontekstualnih faktora.

Generacijske razlike u nivou razvijenosti liderskih veština

Rezultati jednofaktorske analize varijanse pokazali su da ne postoje statistički značajne razlike u ukupnom skoru na inventaru ishoda studentskog liderstva između studenata različitih godina studija. Kao što prikazuje Tabela 3, razlike nisu značajne ni na pojedinačnim subskalama instrumenta ($p > .05$). Drugim rečima, studenti prve, druge, treće i četvrte godine se ne razlikuju značajno u nivou razvijenosti liderskih veština.

Tabela 3
Razlike u liderskim veštinama u odnosu na godinu studija

	Godina studija	*AS*	*SD*	*F*	*df*	*p* - nivo
Ukupno	Prva	99.91	9.94	.39	3(191)	.75
	Druga	101.07	10.62			
	Treća	99.54	11.98			
	Četvrta	101.48	8.24			
Organizacija i planiranje	Prva	3.40	.43	2.05	3(191)	.10
	Druga	3.47	.39			
	Treća	3.25	.52			
	Četvrta	3.33	.41			
Svest o različitostima	Prva	3.65	.47	2.38	3(191)	.07
	Druga	3.84	.31			
	Treća	3.82	.43			
	Četvrta	3.80	.24			
Samoupravljanje	Prva	3.35	.50	.93	3(191)	.42
	Druga	3.35	.48			
	Treća	3.20	.54			
	Četvrta	3.32	.45			
Samopouzdanje	Prva	3.22	.54	.19	3(191)	.94
	Druga	3.14	.55			
	Treća	3.21	.54			
	Četvrta	3.20	.55			
Upotreba tehnologija	Prva	3.17	.70	.74	3(191)	.52
	Druga	3.34	.54			
	Treća	3.26	.63			
	Četvrta	3.30	.50			
Kognitivni razvoj i kritička analiza	Prva	3.52	.47	1.40	3(191)	.24
	Druga	3.63	.38			
	Treća	3.46	.51			
	Četvrta	3.47	.32			

	Godina studija	*AS*	*SD*	*F*	*df*	*p* - nivo
Interpersonalna komunikacija	Prva	2.93	.72	2.14	3(191)	.09
	Druga	3.01	.78			
	Treća	2.88	.75			
	Četvrta	3.22	.58			
Rešavanje problema i donošenje odluka	Prva	3.38	.48	2.45	3(191)	.06
	Druga	3.53	.53			
	Treća	3.59	.55			
	Četvrta	3.64	.39			

Napomena. *AS* – aritmetička sredina; *SD* – standardna devijacija; *F* – vrednost testa analize varijanse; *df* – stepen slobode; *p*-nivo – nivo statističke značajnosti.

Ovakav nalaz ukazuje na to da se nivo liderskih veština ne menja značajno tokom studija, što može biti pokazatelj nedovoljne sistemske podrške njihovom razvoju u visokoškolskom obrazovanju. Dobijeni rezultati time potvrđuju nalaze drugih autora, koji ističu da liderstvo, iako prepoznato kao važna komponenta akademskog i profesionalnog uspeha, još uvek nije adekvatno integrisano u nastavne programe (Cottrell, 2021). Stoga bi u budućem razvoju kurikuluma bilo važno uključiti inovativne pristupe koji podstiču razvoj liderskih veština.

Diskusija

Rezultati sprovedenog istraživanja omogućavaju dublje razumevanje odnosa između liderskih veština i akademskog postignuća studenata pedagogije, ali i načina na koji se ove veštine formiraju u okviru univerzitetskog obrazovanja. Dobijeni podaci pružaju osnov za promišljanje o kvalitetu kurikuluma i njegovom doprinosu razvoju profesionalnih kompetencija budućih pedagoga. Diskusija koja sledi usmerena je na tumačenje ključnih nalaza, njihovo poređenje sa relevantnim istraživanjima i na identifikovanje mogućih pravaca unapređenja kurikuluma studija pedagogije u cilju osnaživanja liderskih potencijala studenata.

Rezultati istraživanja pokazuju da su sa akademskim postignućem studenata značajno povezane one dimenzije liderstva koje se odnose na samoregulaciju, organizaciju i ličnu efikasnost, konkretno: organizacija i planiranje, svest o različitostima, samoupravljanje i samopouzdanje. Iako su ove korelacije niskog intenziteta, njihov pozitivan smer ukazuje na to da studenti sa višim prosekom ocena istovremeno pokazuju i razvijenije oblike samousmerenog ponašanja, bolje upravljanje vremenom i veću veru u sopstvene sposobnosti. Takvi nalazi sugerišu da akademski uspešniji studenti češće poseduju sposobnost postavljanja realnih ciljeva i planiranja njihovog ostvarivanja. Istovremeno, oni reflektuju o sopstvenom napretku i prilagođavaju svoje strategije učenja, što predstavlja suštinske elemente liderskog delovanja (Abbas et al., 2024; Baker & McCarthy, 2019; Komarraju &

Nadler, 2013). Posebno je zanimljivo što se među značajnim faktorima akademskog uspeha našla dimenzija svesti o različitostima, koja podrazumeva otvorenost prema drugačijim mišljenjima, uvažavanje kulturnih, socijalnih i individualnih razlika i sposobnost razumevanja drugih (Denson & Chang, 2009). Ova veština ima izrazito razvojnu i refleksivnu funkciju: ona doprinosi ne samo kvalitetu interpersonalnih odnosa već i sposobnosti studenata da kritički preispituju sopstvene vrednosti, stavove i postupke. Istraživanja pokazuju da je visoka svest o različitostima povezana sa većom akademskom angažovanošću i višim stepenom metakognitivnog učenja (Gurin et al., 2002). Ova korelacija se dovodi u vezu sa razvojem intelektualne fleksibilnosti, tolerancije na višeznačnost i samorefleksije. U tom smislu, razvijenija svest o različitostima može doprineti akademskom uspehu posredno, kroz unapređivanje socio-emocionalnih i refleksivnih aspekata učenja, koji su sastavni deo samoregulativnog funkcionisanja. Ovakav nalaz je u skladu sa ranijim istraživanjima koja potvrđuju da samoregulacija, sposobnost planiranja i samoprocenjivanja kompetencija čine ključne prediktore akademskog uspeha (Al-Abyadh & Abdel Azeem, 2022; Komarraju & Nadler, 2013). Istraživanja takođe ukazuju na to da samopouzdanje, kao centralna komponenta samoevaluacije, utiče na postavljanje ciljeva i motivaciju za učenje, a time i na akademska postignuća (Stankov et al., 2014). U tom smislu, dimenzije liderstva koje su intrapersonalne prirode, kao što su samopouzdanje, samoupravljanje i organizacija, mogu delovati kao posrednici između motivacionih i kognitivnih procesa u učenju, što objašnjava njihovu jaču povezanost sa akademskim postignućem u odnosu na interpersonalne dimenzije.

S druge strane, dimenzije koje se odnose na interpersonalnu komunikaciju, upotrebu tehnologija i rešavanje problema nisu pokazale statistički značajnu povezanost sa prosekom ocena. Moguće objašnjenje leži u činjenici da se ove veštine ne odražavaju neposredno na formalne akademske pokazatelje, kao što su ocene, već na više doprinose razvoju širih socijalnih i profesionalnih kapaciteta (Chan, 2023). Na primer, komunikacione veštine, iako ključne za timski rad i saradnju, često nisu predmet eksplicitne evaluacije u akademskom kontekstu, dok se veštine vezane za rešavanje problema i upotrebu tehnologija češće manifestuju u praktičnim i projektno orijentisanim oblicima rada koji ne ulaze u tradicionalne metrike akademskog uspeha. Slično, Pansakala i saradnici (Pansacala et al., 2024) ističu da kvalitet liderske uloge i stepen odgovornosti mogu imati veću važnost od same učestalosti preuzimanja liderskih aktivnosti, što dodatno potvrđuje složenost odnosa između liderskih i akademskih dimenzija studentskog funkcionisanja.

U celini, rezultati ovog istraživanja potvrđuju da intrapersonalne dimenzije liderstva imaju snažniju povezanost sa akademskim uspehom od interpersonalnih. Ovaj odnos može se razumeti u kontekstu specifičnosti akademskog okruženja, u kojem se uspeh u većoj meri oslanja na individualne nego na socijalne aspekte liderskog delovanja. Intrapersonalne veštine deluju kao unutrašnji mehanizmi upravljanja učenjem, omogućavajući studentima da efikasnije organizuju svoje akademske obaveze, održe kontinuitet u učenju i prilagode strategije rada zahtevima nastavnog procesa. Nasuprot tome, interpersonalne dimenzije liderstva svoju punu funkcionalnost ispoljavaju pre svega u pro-

fesionalnom kontekstu, koji podrazumeva interakciju, zajedničko donošenje odluka i preuzimanje odgovornosti unutar grupe, što nije uvek direktno reflektovano u formalnim akademskim pokazateljima uspeha. Stoga se može zaključiti da je jača povezanost intrapersonalnih liderskih veština sa akademskim postignućem studenata u skladu sa srtukturom i kriterijumima vrednovanja u visokom obrazovanju. To implicira da razvoj samoregulativnih, refleksivnih i organizacionih kompetencija treba da zauzme centralno mesto u programima inicijalnog obrazovanja budućih pedagoga. Uvođenje obrazovnih pristupa koji podstiču samostalnost, samoevaluaciju i preuzimanje odgovornosti za učenje može doprineti istovremenom razvoju liderskih potencijala i akademske efikasnosti.

Dobijeni nalazi takođe pokazuju da se nivo razvijenosti liderskih veština studenata pedagogije ne razlikuje značajno između godina studija, što ukazuje na odsustvo progresivnog razvoja ovih veština tokom akademskog obrazovanja. Ovakav rezultat može se tumačiti kao odraz činjenice da programi osnovnih studija pedagogije još uvek ne sadrže dovoljno elemenata koji bi sistematski podsticali razvoj liderskih kapaciteta. Iako se kroz pojedine predmete, projekte i oblike rada implicitno razvijaju veštine saradnje, organizacije i odgovornosti, aktivnosti kojima se te veštine possšešuju nisu dovoljno strukturisane. Zbog toga programi osnovnih studija ne dovode do značajnih razlika u razvijenosti liderskih veština između generacija. Ovaj nalaz potvrđuje zapažanja autora koji naglašavaju da razvoj liderskih veština u kontekstu obrazovanja nije spontani proces, već rezultat planskog kurikularnog oblikovanja i refleksivnog iskustvenog učenja (Komives et al., 2005; Northouse, 2021). U skladu s modelom razvoja liderskog identiteta (Komives et al., 2005), formiranje liderskih kapaciteta zahteva dugotrajan proces samospoznaje, interakcije i povratne informacije. Pri tome, refleksija ima ključnu ulogu u povezivanju iskustva sa razvojem svesti o sopstvenom liderskom potencijalu. Ukoliko obrazovni programi ne nude dovoljno prilika za ovakva iskustva, liderstvo ostaje latentna, a ne formativna komponenta profesionalnog identiteta studenata pedagogije.

Posebno je značajno što su dimenzije organizacija i planiranje, svest o različitostima, samoupravljanje i samopouzdanje pokazale povezanost sa akademskim postignućem, iako se njihov nivo ne menja tokom studija. Ova pojava može ukazivati na to da pomenute veštine predstavljaju stabilne individualne karakteristike koje doprinose akademskom uspehu, ali koje visokoškolsko okruženje ne uspeva dalje da osnaži. Slično tumačenje nalazimo kod autora koji ističu da je razvoj liderskih veština u visokom obrazovanju uslovljen kontekstualnim faktorima – kvalitetom nastavnog procesa, klimom podrške i mogućnostima za aktivno učešće studenata u zajedničkom odlučivanju (Dugan & Komives, 2010; Guthrie & Jenkins, 2018). U tom smislu, ovi rezultati otvaraju prostor za preispitivanje postojećih kurikularnih rešenja i predlažu potrebu za sistematičnijim pristupom razvoju liderskih veština budućih pedagoga. Integracija elemenata poput servisnog učenja (eng. *service learning*), timskih projekata, studija slučaja i refleksivnih dnevnika mogla bi doprineti dubljem razumevanju liderske uloge pedagoga kao facilitatora promena. Takvi oblici rada omogućavaju studentima da povežu teorijska znanja sa praktičnim iskustvima, pri čemu razvijaju refleksivnu funkciju – sposobnost kritičkog sagledavanja sopstvenih po-

stupaka, vrednosti i profesionalnog delovanja u kontekstu društvenih odnosa i obrazovnih ciljeva (Mezirow, 2000).

Završna razmatranja i kurikularne implikacije

Polazeći od nalaza istraživanja koji ukazuju na to da su pojedine liderske veštine značajno povezane sa akademskim postignućem, ali da njihov razvoj tokom studija nije izražen, nameće se potreba za osmišljavanjem i implementacijom kurikularnih intervencija koje bi sistematski podsticale formiranje i jačanje liderskih veština kod budućih pedagoga. Prvi korak podrazumeva integrisanje ishoda učenja koji eksplicitno obuhvataju liderske dimenzije, poput sposobnosti organizovanja zajedničkog rada, donošenja odluka, preuzimanja odgovornosti i refleksivnog samoupravljanja (Komives et al., 2006). Takvi ishodi mogu biti deo postojećih predmeta kroz uvođenje problemski orijentisanih zadataka i timskih projekata. Drugi vid intervencija obuhvata uvođenje iskustvenih i participativnih metoda učenja, kao što su servisno učenje, projektna nastava i vršnjačko mentorstvo (eng. *peer mentoring*), koje omogućavaju studentima da kroz realne situacije razvijaju i testiraju svoje liderske kapacitete (Guthrie & Jenkins, 2018). U okviru takvih aktivnosti, studenti preuzimaju različite uloge, uče da planiraju, koordiniraju, rešavaju konflikte i vrednuju rezultate zajedničkog rada. Na taj način se liderske veštine transformišu iz individualnih u funkcionalne kvalitete. Posebno važnu ulogu ima refleksivna praksa, koja omogućava studentima da prepoznaju sopstveni stil vođenja i njegovo etičko utemeljenje (Day et al., 2014). Takva refleksija doprinosi razvoju samosvesti, ali i svesti o različitostima – razumevanju i uvažavanju drugačijih perspektiva, kao i kulturnih i individualnih razlika, što je od posebne važnosti za pedagošku profesiju. Treći pravac intervencija odnosi se na razvijanje institucionalne kulture koja vrednuje i prepoznaje liderstvo studenata kroz podršku studentskim organizacijama, inicijativama i istraživačkim projektima u kojima studenti preuzimaju odgovornost za planiranje i realizaciju aktivnosti (Dugan & Komives, 2010). Na taj način se liderstvo ne posmatra kao kvalitet pojedinca, već kao proces zajedničkog delovanja i profesionalnog sazrevanja u akademskoj zajednici. Sve navedene intervencije ukazuju na potrebu da se liderstvo u obrazovanju budućih pedagoga razume kao dinamičan i razvojni proces. Takav pristup zahteva pažljivo kurikularno planiranje, interakciju teorije i prakse i kontinuiranu refleksiju. Na taj način bi budući pedagozi bili osposobljeni da prepoznaju, usmeravaju i inspirišu razvoj potencijala u drugima.

Iako je istraživanje pružilo relevantne uvide u povezanost liderskih veština s akademskim postignućem studenata pedagogije, potrebno je istaći određena ograničenja koja utiču na mogućnost generalizacije rezultata. Prvo, uzorak od 194 ispitanika obuhvata studente samo jednog fakulteta, što ograničava reprezentativnost i mogućnost uopštavanja nalaza na širu populaciju studenata pedagogije u Srbiji. Drugo, primenjeni instrument je zasnovan na samoproceni liderskih veština, pa postoji rizik od subjektivnih pristrasnosti i socijalno poželjnih odgovora (Podsakoff et al., 2003). Treće, istraživanje je imalo transverzalni karakter, što onemogućava zaključivanje o uzročno-posledičnim odnosima između

akademskog uspeha i razvijenosti liderskih veština. Konačno, nisu uzeti u obzir spoljašnji faktori koji bi mogli imati uticaj na razvoj liderstva, poput učešća studenata u vannastavnim aktivnostima, prakse, volontiranja ili prethodnog radnog iskustva. U budućim istraživanjima bi bilo korisno primeniti longitudinalni dizajn i kombinovati kvantitativne i kvalitativne metode, čime bi se omogućilo dublje razumevanje procesa formiranja liderskih veština tokom studiranja.

Reference

Abbas, S. G., Mahjabeen, A., Ayub, U., & Iqbal, A. (2024). Examining the Influence of Student Leadership Roles on Academic Performance in Secondary Schools. *Journal for Current Sign, 2*(3), 148-162.

Al-Abyadh, M. H. A., & Abdel Azeem, H. A. H. (2022). Academic Achievement: Influences of University Students' Self-management and Perceived Self-efficacy. *Journal of Intelligence*, *10*(3), 55. https://doi.org/10.3390/jintelligence10030055

Bakar, N. A., Abdullah, M. R., & Yusof, N. (2018). Leadership Roles in Student Government and their Impact on GPA. *Journal of Educational Psychology*, *110*(3), 373-385.

Baker, S. B., & McCarthy, M. (2019). The Influence of Leadership Experiences on Academic Achievement. *Educational Psychology Review, 31*(1), 122.

Brown, M. E., Treviño, L. K., & Harrison, D. A. (2005). Ethical leadership: A social learning perspective for construct development and testing. *Organizational behavior and human decision processes*, *97*(2), 117-134. https://doi.org/10.1016/J.OBHDP.2005.03.002

Chan, I. L. (2023). *Effects of Student Leadership Style on Their Academic Performance* (Publication No. 4321) [Doctoral Dissertations, Liberty University]. https://digitalcommons.liberty.edu/doctoral/4231

Cheong, J. (2020). The Correlation between Student Leadership and Academic Motivation. *AsiaPacific Journal of Education, 40*(2), 178-190.

Cottrell, S. (2021). *Skills for Success: Personal Development and Employability* (4th ed.). Bloomsbury Publishing.

Day, D., Fleenor, J., Atwater, L., Sturm, R., & Mckee, R. (2014). Advances in Leader and Leadership Development: A Review of 25 Years of Research and Theory. *The Leadership Quarterly*, *25*(1), 63-82. https://doi.org/10.1016/j.leaqua.2013.11.004

Deng, W., Li, X., Wu, H., & Xu, G. (2020). Student Leadership and Academic Performance. *China Economic Review, 60*, 101389. https://doi.org/10.1016/j.chieco.2019.101389

Denson, N., & Chang, M. J. (2009). Racial Diversity Matters: The Impact of Diversity-related Student Engagement and Institutional Context. *American Educational Research Journal, 46*(2), 322-353. https://doi.org/10.3102/0002831208323278

Dugan, J. P., Komives, S. R., & Segar, T. C. (2009). College Student Capacity for Socially Responsible Leadership: Understanding Norms and Influences of Race, Gender, and Sexual Orientation. *NASPA Journal*, *45*(4), 475-500. https://doi.org/10.2202/1949-6605.2008

Dugan, J. P., & Komives, S. R. (2010). Influences on College Students' Capacities for Socially Responsible Leadership. *Journal of College Student Development, 51*(5), 525-549. https://doi.org/10.1353/csd.2010.0009

Dugan, J. P. (2024). *Leadership Theory: Cultivating Critical Perspectives* (2nd ed.). John Wiley & Sons.

El Morabit, N. (2024). Navigating Leadership: Examining the Impact of Leadership Roles in School-Based Educational Clubs on Students' Development and Academic Performance. *Middle East Journal of Scientific Publishing*, 6(3), 473-495.

Elmuti, D., Minnis, W., & Abebe, M. (2005). Does Education Have a Role in Developing Leadership Skills? *Management Decision, 43*(7-8), 1018-1031. https://doi.org/10.1108/00251740510610017

Gannouni, K., & Ramboarison-Lalao, L. (2016). Leadership and Students' Academic Success: Mediating Effects of Self-efficacy and Self-determination. *International Journal of Leadership in Education*, *21*(1), 66-79. https://doi.org/10.1080/13603124.2015.1123300

Gurin, P., Dey, E. L., Hurtado, S., & Gurin, G. (2002). Diversity and Higher Education: Theory and Impact on Educational Outcomes. *Harvard Educational Review, 72*(3), 330-366. https://doi.org/10.17763/haer.72.3.01151786u134n051

Guthrie, K. L., & Jenkins, D. M. (2018). *The Role of Leadership Educators: Transforming Learning*. IAP.

Harris, A., & Jones, M. (2019). Teacher Leadership and Educational Change. *School leadership & management*, *39*(2), 123-126. https://doi.org/10.1080/13632434.2019.1574964

Horishna, N., Slozanska, H., Soroka, O., & Romanovska, L. (2019). Exploring the Leadership Skills of Pre-service Social Work Students: Implications for Social Work Education. *Problems of Education in the 21st Century*, *77*(5), 598-615. https://doi.org/10.33225/PEC/19.77.598

Kezar, A., Carducci, R., & Contreras-McGavin, M. (2006). *Rethinking the "L" Word in Higher Education: The Revolution of Research on Leadership. ASHE Higher Education Report, 31*(6). Jossey-Bass.

Komarraju, M., & Nadler, D. (2013). Self-Efficacy and Academic Achievement: Why Do Implicit Beliefs, Goals, and Effort Regulation Matter? *Learning and Individual Differences, 25*, 67-72. http://doi.org/10.1016/j.lindif.2013.01.005

Komives, S. R., Owen, J. E., Longerbeam, S. D., Mainella, F. C., & Osteen, L. (2005). Developing a Leadership Identity: A Grounded Theory. *Journal of College Student Development, 46*(6), 593-611. https://doi.org/10.1353/csd.2005.0061

Komives, S. R., Longerbeam, S. D., Owen, J. E., Mainella, F. C., & Osteen, L. (2006). A Leadership Identity Development Model: Applications from a Grounded Theory. *Journal of College Student Development, 47*(4), 401-418. https://doi.org/10.1353/csd.2006.0048

Komives, S. R., Lucas, N., & McMahon, T. R. (2013). *Exploring Leadership: For College Students Who Want to Make a Difference* (3rd ed.). Jossey-Bass.

Letić Lungulov, M., i Radujkov, S. (2024). Istraživanje liderskih veština budućih pedagoga: validacija inventara ishoda studentskog liderstva. *Inovacije u nastavi, 37*(3), 107-119. https://doi.org/10.5937/inovacije2403107L

Mezirow, J. (2000). Learning to Think like an Adult. Core Concepts of Transformation Theory. In J. Mezirow, & Associates (Eds.), *Learning as Transformation. Critical Perspectives on a Theory in Progress* (pp. 3-33). Jossey-Bass.

Morony, S., Kleitman, S., Lee, Y. P., & Stankov, L. (2013). Predicting Achievement: Confidence vs Self-efficacy, Anxiety, and Self-concept in Confucian and European Countries. *International Journal of Educational Research, 58*, 79-96. https://doi.org/10.1016/j.ijer.2012.11.002

Mumford, E. (1906). The Origins of Leadership. *American Journal of Sociology, 12*(2), 216-240. https://www.jstor.org/stable/2762385

Northouse, P. G. (2021). *Leadership: Theory and Practice* (9th ed.). SAGE Publications.

Pansacala, J. A. G. S., Napalla, E. R., & Tabaosares, C. M. (2024). The Relationship between Student Leadership and Academic Success. *International Journal of Science and Management Studies (IJSMS)*, *7*(6), 117-122. https://doi.org/10.51386/25815946/ijsms-v7i6p113

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology, 88*(5), 879-903. http://doi.org/10.1037/0021-9010.88.5.879

Spillane, J. P. (2006). *Distributed leadership.* Jossey-Bass.

Stankov, L., Morony, S., & Lee, Y. P. (2014). Confidence: the best non-cognitive predictor of academic achievement? *Educational Psychology, 34*(1), 9-28. http://doi.org/10.1080/01443410.2013.814194

Tannenbaum, R., Weschler, I., & Massarik, F. (2013). *Leadership and Organization (RLE: Organizations): A Behavioural Science Approach*. Routledge.

Vann, M. (2000). *Student Leadership Outcomes Inventory.* University Unions and Student Activities, Virginia Polytechnic Institute and State University.

Yukl, G. A., & Gardner, W. L. (2020). *Leadership in Organizations* (9th ed.). Pearson Education.

Primljeno: 14.10.2025.
Korigovana verzija primljena: 13.01.2026.
Prihvaćeno za štampu: 20.01.2026.

Milena Letić Lungulov
Odsek za pedagogiju, Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad, Srbija
https://orcid.org/0000-0001-8666-5430

Jovana Turudić
Odsek za pedagogiju, Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad, Srbija
https://orcid.org/0000-0001-5939-2238

Saška Radujkov
Odsek za pedagogiju, Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad, Srbija
https://orcid.org/0009-0005-6308-9166



Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Nastava i vaspitanje, 2026, *75*(2), 355-372
https://doi.org/10.5937/niv75-60792

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Digitalna pismenost i digitalna kompetencija u nastavi engleskog kao stranog jezika: stavovi nastavnika i pedagoška stvarnost

Maja Veljković Michos[1]
Univerzitet Singidunum, Beograd, Srbija
Valentina Bošković Marković
Univerzitet Singidunum, Beograd, Srbija
Sacmir Seferović
Univerzitet Sinergija, Bijeljina, Bosna i Hercegovina

Apstrakt *Ovaj rad istražuje ulogu digitalne pismenosti i digitalne kompetencije u nastavi i učenju engleskog kao stranog jezika (engl. EFL), sa fokusom na efikasnu primenu digitalnih alata u nastavnoj praksi. Istaknuta su dva međusobno povezana pojma: digitalna pismenost, definisana kao sposobnost pristupa, procene, korišćenja i kreiranja informacija putem digitalnih tehnologija; i digitalna kompetencija, koja podrazumeva skup kognitivnih, tehničkih i socijalnih veština potrebnih za smisleno učestvovanje u digitalnom okruženju. Primenjeno je kvantitativno istraživanje radi ispitivanja kompetencija i stavova EFL nastavnika, kao i sopstvene percepcije o digitalnoj pismenosti. Učestvovalo je 139 EFL nastavnika iz Srbije i Bosne i Hercegovine, a upitnik je sadržao pitanja zatvorenog i otvorenog tipa, uključujući Likertovu skalu i višestruki izbor. Rezultati pokazuju da se digitalna pismenost prepoznaje kao suštinski deo nastave jezika. Ispitanici poseduju visok nivo svesti o pedagoškim prednostima digitalne pismenosti, naročito u podsticanju autonomije i samopouzdanja učenika. Međutim, i dalje se prepoznaju izazovi: neujednačen pristup tehnologiji, rizici u vezi sa digitalnom bezbednošću i ograničene mogućnosti za specijalizovanu obuku nastavnika. Dok rezultati potvrđuju obe hipoteze – samopercepciju nastavnika o digitalnoj pismenosti i prepoznavanje njenog obrazovnog značaja – studija naglašava potrebu za podrškom nastavnicima u primeni digitalnih alata u učionici. Rad skreće pažnju na važnost integracije digitalne pismenosti i kompetencije u nastavu jezika, i ukazuje na potrebu za kontinuiranom podrškom nastavnicima u tehnološki unapređenoj nastavi.*

Ključne reči: *digitalna pismenost, digitalna kompetencija, ESL nastavnici, nastava jezika, digitalni alati.*

1 mveljkovic@singidunum.ac.rs

Uvod

Digitalna pismenost postala je jedna od ključnih veština 21. veka, oblikujući načine na koje pojedinci pristupaju informacijama, komuniciraju i učestvuju u celoživotnom učenju (Spires et al., 2018). U nastavi jezika, ona doprinosi unapređenju kompetencija učenika putem digitalnih alata i internet-resursa. Definisana kao sposobnost pronalaženja, organizovanja, procenjivanja, razumevanja i kreiranja informacija korišćenjem digitalnih tehnologija (Reddy et al., 2020a), njena sve veća važnost odražava rastuću zabrinutost u vezi sa dostupnošću podataka, bezbednošću na internetu i sadržajima koje kreiraju sami korisnici (Mandić et al., 2024).

Usko povezan pojam jeste digitalna kompetencija, koja podrazumeva integraciju kognitivnih, tehničkih i socijalnih veština neophodnih za smisleno učešće u digitalnim okruženjima (Reddy et al., 2020a; Reddy et al., 2020b). Dok digitalna pismenost naglašava kritički odnos prema informacijama, digitalna kompetencija stavlja akcenat na njihovu etičku i efikasnu primenu. Džang i Vu (Zhang & Wu, 2025) utvrdili su da nastavnici sa razvijenijim digitalnim veštinama postižu bolje rezultate u planiranju nastave, angažovanju učenika i prilagođavanju različitim nastavnim situacijama. Ipak, integracija digitalnih tehnologija u nastavu i dalje nije ujednačena. Pregled 24 istraživanja iz oblasti nastave engleskog kao stranog jezika (Yalçin & Bozyiğit, 2023) ukazuje na potrebu za ciljanim stručnim usavršavanjem nastavnika. Slične nalaze potvrđuju i regionalna istraživanja: Veljković Mihos i Bošković Marković (Veljković Michos & Bošković Marković, 2020) pokazale su da nastavnici stranih jezika prepoznaju značaj digitalnih alata, ali se suočavaju sa neujednačenom institucionalnom podrškom, dok su Gavranović i Veljković Mihos (Gavranović & Veljković Michos, 2022) utvrdili da hibridna nastava doprinosi razvoju digitalnih kompetencija, budući da od nastavnika zahteva snalaženje kako u fizičkom tako i u virtuelnom okruženju. Institucionalne inicijative, poput platforme Univerziteta u Sarajevu (UNICEF, 2023) i Okvira digitalnih kompetencija Republike Srbije (Ministarstvo prosvete, 2023), predstavljaju strateške napore usmerene ka unapređenju pedagoške i tehnološke osposobljenosti nastavnika, sa ciljem integrisanja digitalnih alata u planiranje nastave, interakciju u učionici i vrednovanje postignuća učenika.

Polazeći od navedenih pedagoških pretpostavki, ovo istraživanje ispituje na koji način se digitalna pismenost i digitalna kompetencija integrišu u nastavu engleskog jezika kao stranog. Posebna pažnja posvećena je upotrebi digitalnih tehnologija od strane nastavnika, kao i njihovoj samoproceni digitalnih veština. U skladu sa ciljevima istraživanja i relevantnom literaturom, formulisane su dve hipoteze: (H1) nastavnici engleskog jezika kao stranog smatraju sebe digitalno pismenim i pokazuju digitalnu kompetentnost kroz upotrebu odabranih digitalnih alata u nastavi; i (H2) nastavnici engleskog jezika kao stranog svesni su značaja digitalne pismenosti u savremenom obrazovanju. Istraživanje se zasniva na kvantitativnoj metodologiji, obuhvatajući ispitivanje stavova i iskustava 139 nastavnika engleskog jezika iz Srbije i Bosne i Hercegovine u vezi sa smislenom integracijom digitalnih alata u nastavni proces. Smeštanjem rezultata u širi globalni i regionalni

kontekst, rad doprinosi boljem razumevanju načina na koji digitalne tehnologije oblikuju jezičko obrazovanje u specifičnom društvenom okruženju. Posebno se razmatraju izazovi kao što su digitalni jaz, nejednak pristup tehnologiji, zaštita privatnosti podataka i nedovoljno ujednačena obuka nastavnika. Analizom aktuelnih praksi i percepcija pokazuje se kako se digitalna pismenost i digitalna kompetencija mogu uspešno integrisati u nastavu engleskog jezika radi podsticanja autonomije učenika i njihovog aktivnijeg uključivanja u proces učenja.

Digitalna pismenost i kritičko vrednovanje sadržaja

UNESCO ističe da digitalna pismenost danas predstavlja jednu od osnovnih životnih veština koja povećava mogućnosti zapošljavanja i ubrzava sticanje drugih kompetencija (Karpati, 2011). Ona obuhvata sposobnost bezbednog i samouverenog snalaženja u digitalnim okruženjima. Furber (Furber, 2012) smatra da bi učenici do završetka obaveznog obrazovanja trebalo da budu digitalno pismeni, odnosno sposobni da kreiraju i uređuju tekstualne, vizuelne, audio i video sadržaje, kritički procenjuju informacije dostupne na internetu, koriste kancelarijske softverske alate i razvijaju pismenost kroz digitalno čitanje i pisanje. Iako se raniji okviri i modeli (Brown et al., 2016; Furber, 2012) danas mogu činiti prevaziđenim, oni i dalje predstavljaju značajne referentne tačke za razumevanje razvoja digitalne pismenosti i kritičkog vrednovanja digitalnih sadržaja.

Tabela 1
Pregled ključnih pojmova (prema Brown et al., 2016)

	Informaciona pismenost	Medijska pismenost	Računarska pismenost	Digitalna pismenost
Definicija	Sposobnost efikasnog pronalaženja, identifikovanja, pristupanja, obrade i korišćenja digitalnih informacija (Karpati, 2011).	Sposobnost pristupanja medijskim sadržajima, njihovog razumevanja, analiziranja i kritičkog vrednovanja, kao i efikasnog kreiranja i prenošenja informacija putem različitih platformi i u različitim kontekstima (European Commission, 2018).	Osnovno razumevanje računarskih sistema i softvera; skup suštinskih kompetencija neophodnih za smisleno učešće u digitalno posredovanom društvu, u kojem su usluge i resursi dostupni i distribuirani putem interneta (Karpati, 2011).	Sposobnost korišćenja, vrednovanja i integrisanja različitih digitalnih resursa u kontekstu celoživotnog učenja, sa naglaskom na kritičko procenjivanje digitalnih sadržaja.

Vajsberg i saradnici (Weisberg et al., 2023) ističu da kritičko mišljenje ima centralnu ulogu u načinu na koji učenici pretražuju, tumače i procenjuju informacije. U kontekstu nastave engleskog jezika kao stranog, Silvijani i saradnici (Silvhiany et al., 2021) utvrdili su da se učenici često oslanjaju na površne karakteristike izvora informacija umesto da analiziraju autorstvo, nameru autora ili dokaze na kojima se informacije zasnivaju. Ovi nalazi ukazuju na potrebu da se učenici osposobe za kritičko promišljanje kako bi postali samostalni i odgovorni digitalni građani. U Tabeli 1 prikazane su kategorije digitalne pismenosti, preuzete i prilagođene prema istraživanju Brauna i saradnika (Brown et al., 2016), koje i dalje predstavljaju značajno polazište za savremena istraživanja u ovoj oblasti.

Pored osnovnih oblika pismenosti – informacione, medijske, računarske i digitalne – savremeni pristupi uvode i petu kategoriju: pismenost u oblasti veštačke inteligencije (engl. AI literacy), koja se definiše kao sposobnost razumevanja, vrednovanja i etičkog korišćenja tehnologija zasnovanih na veštačkoj inteligenciji (Ng et al., 2021; Su et al., 2023; UNESCO, 2024).

Savremene perspektive digitalne i AI pismenosti i kompetencija

Savremena istraživanja digitalne pismenosti (Nguyen & Habók, 2024; Sánchez-Cruzado et al., 2021) i digitalnih kompetencija (Basilotta-Gomez-Pablos et al., 2022; Guillén-Gámez et al., 2021) bave se modelima njihovog sticanja i procene, ukazujući na potrebu za kontinuiranim unapređivanjem pedagoških znanja i veština nastavnika stranih jezika.

Basilota-Gomez-Pablos i saradnici (Basilotta-Gomez-Pablos et al., 2022) definišu digitalnu kompetenciju kao skup znanja, veština i stavova neophodnih za efikasnu upotrebu tehnologije u nastavi. Njihov pregled 56 istraživanja pokazuje da nastavnici često procenjuju sopstveni nivo digitalnih kompetencija kao nizak ili umereno nizak, posebno u oblasti vrednovanja i ocenjivanja. Takođe su uočene razlike između nivoa kompetencija i stvarne upotrebe veb-alata, pri čemu uzrast i pol utiču na razvijenost digitalnih veština (Guillén-Gámez et al., 2021). Sančez-Kruzado i saradnici (Sánchez-Cruzado et al., 2021), na osnovu istraživanja sprovedenog među 4.883 nastavnika u Španiji, došli su do sličnih rezultata u pogledu niske samoprocene digitalnih kompetencija i predložili program stručnog usavršavanja zasnovan na Zajedničkom okviru Naionalnog instituta za obrazovne tehnologije i obuku nastavnika (Instituto Nacional de Tecnologías Educativas y Formación del Profesorado – INTEF), uz primenu alata ACDC. Ngujen i Habok (Nguyen & Habók, 2024), analizirajući istraživanja objavljena u periodu od 2011. do 2022. godine, ukazuju na značaj obrazovnih tehnologija za nastavu, učenje, profesionalni razvoj nastavnika i podršku učenicima. Savremeni okviri sve više obuhvataju i oblast veštačke inteligencije, poput UNESCO-vog Okvira kompetencija za veštačku inteligenciju (UNESCO, 2024), koji definiše znanja, veštine i vrednosti neophodne nastavnicima za odgovornu primenu veštačke inteligencije.

Pismenost u oblasti veštačke inteligencije postala je značajna dimenzija digitalne pismenosti (Nguyen & Habók, 2024; Su et al., 2023). Njena integracija omogućava personalizovano učenje kroz nastavne materijale prilagođene sposobnostima i interesovanjima učenika, dok povratne informacije podržane veštačkom inteligencijom doprinose većem angažovanju i motivaciji učenika. Istovremeno, sve veća zastupljenost veštačke inteligencije i robotike u obrazovanju otvara brojna pedagoška i etička pitanja i izazove (Mandić et al., 2024).

Inicijative za uvođenje veštačke inteligencije u predškolsko obrazovanje privlače sve veću pažnju uprkos raspravama o njihovoj prikladnosti i opravdanosti (Su et al., 2023). Rano upoznavanje dece sa pismenošću u oblasti veštačke inteligencije doprinosi razvoju teorije uma, emocionalne svesti, kreativnog istraživanja i saradničkog učenja (Su & Yang, 2022). Kada se digitalna pismenost razvija od najranijeg uzrasta, učenici su bolje pripremljeni za korišćenje alata zasnovanih na veštačkoj inteligenciji u svrhu personalizovanog učenja, automatizovanog pružanja povratnih informacija, kao i podrške u pisanju kroz sintezu informacija i generisanje ideja. Nastavnici takođe imaju koristi od primene veštačke inteligencije u administrativnim poslovima, kao što su ocenjivanje, izrada nastavnih programa, kreiranje nastavnih sadržaja, ispravljanje učeničkih radova i predviđanje potencijalnih rizika u procesu učenja (Galindo-Domínguez et al., 2024).

Globalna digitalizacija i regionalne perspektive

Globalna digitalizacija tokom pandemije COVID-19 ubrzala je integraciju digitalnih alata u obrazovanju. U Srbiji se nastava stranih jezika prilagodila novim okolnostima uz minimalne poteškoće zahvaljujući platformama kao što su *Google Meet*, *Microsoft Teams*, *Zoom* i *Skype*, koje su omogućile virtuelna iskustva slična tradicionalnoj nastavi u učionici (Ilić & Bošković Marković, 2020; Veljković Michos & Bošković Marković, 2020). Efikasnost primene ovih tehnologija zavisi od pedagoške procene nastavnika, pri čemu digitalno kompetentni nastavnici osmišljavaju nastavne aktivnosti i ishode učenja nezavisno od nivoa tehnološke osposobljenosti učenika (Veljković Michos & Bošković Marković, 2020).

Takvi nastavnici istovremeno moraju da obavljaju i osnovne nastavne zadatke – pregledanje domaćih zadataka, ispravljanje pismenih radova i kreiranje onlajn aktivnosti – dok se istovremeno snalaze u različitim digitalnim okruženjima i platformama. Ipak, mnogi od njih nemaju formalno obrazovanje ili obuku za osmišljavanje i upravljanje digitalnim okruženjima za učenje (Ristić, 2019). Istraživanje sprovedeno na uzorku od 200 ispitanika (100 studenata i 100 nastavnika) potvrdilo je da su pedagoške i digitalne kompetencije nastavnika od suštinskog značaja za održavanje angažovanosti učenika i obezbeđivanje dinamičnog i smislenog predstavljanja nastavnih sadržaja (Veljković Michos et al., 2024).

Više zvaničnih dokumenata u Srbiji definiše okvire digitalnih kompetencija nastavnika. Ministarstvo prosvete usvojilo je Okvir digitalnih kompetencija – Nastavnik za digi-

talno doba 2017. godine, koji je revidiran 2019. godine, sa ciljem unapređenja kvaliteta nastave i efikasne primene digitalnih tehnologija u obrazovanju. Nadovezujući se na ovaj dokument, Zavod za vrednovanje kvaliteta obrazovanja i vaspitanja uveo je 2022. godine Instrument za samoprocenu digitalnih kompetencija nastavnika. Godine 2023. objavljena je revidirana verzija dokumenta Okvir digitalnih kompetencija – Nastavnik za digitalno doba, koja obuhvata kompetencije kao što su upravljanje digitalnim informacijama, kreiranje digitalnih sadržaja, podsticanje onlajn saradnje, sprovođenje digitalnog vrednovanja i obezbeđivanje etičke upotrebe tehnologija.

U skladu sa međunarodnim trendovima, Srbija je pokazala stratešku posvećenost integraciji digitalnih tehnologija u nastavnu praksu. Sa ciljem standardizacije njihove primene, Jokić i saradnici (Jokić et al., 2025) potvrdili su pouzdanost i strukturu revidiranog instrumenta za procenu digitalnih kompetencija nastavnika, pokazavši da se ove kompetencije mogu organizovati u jasno definisane oblasti digitalne prakse. Ove inicijative doprinose operacionalizaciji digitalnih standarda u obrazovnom sistemu Srbije i dodatno potvrđuju relevantnost i primenljivost postojećeg okvira digitalnih kompetencija.

Slično tome, Univerzitet u Sarajevu pokrenuo je platformu DigiEdu sa ciljem unapređenja digitalnih i pedagoških kompetencija nastavnika u Bosni i Hercegovini. Platforma nudi akreditovane onlajn kurseve, interaktivne radionice i sveobuhvatnu bazu obrazovnih resursa koja se kontinuirano proširuje, uz podršku organizacija UNICEF, USAID i Erasmus+ (UNICEF, 2023). U istom kontekstu, Seferović (Seferović, 2023) istraživao je digitalnu pismenost nastavnika engleskog jezika kao stranog u Bosni i Hercegovini i Srbiji, ističući ulogu digitalnih alata kao pokretača kritičkog promišljanja, aktivnog angažovanja učenika i razvoja autonomnog učenja.

Metodologija istraživanja

U skladu sa međunarodnim standardima, obe zemlje Balkana podstiču razvoj digitalnih kompetencija nastavnika kroz nacionalne i institucionalne inicijative. Ovo istraživanje zasniva se na kvantitativnom pristupu sa ciljem ispitivanja uloge digitalne pismenosti i digitalne kompetencije u nastavi engleskog jezika kao stranog, kao i integracije digitalnih alata u nastavni proces. Ciljevi istraživanja obuhvataju ispitivanje stavova, percepcija i iskustava nastavnika u vezi sa digitalnim tehnologijama, procenu njihovih kompetencija i analizu svesti o značaju razvoja digitalne pismenosti u jezičkom obrazovanju. Istraživanje je vođeno dvema hipotezama: prva polazi od pretpostavke da nastavnici engleskog jezika kao stranog poseduju adekvatan nivo digitalne pismenosti za efikasnu integraciju digitalnih alata u nastavu, dok druga pretpostavlja da oni prepoznaju značaj digitalne pismenosti i digitalnih kompetencija u savremenom društvu.

Instrument za prikupljanje podataka

Upitnik je prvobitno razvijen 2023. godine u okviru master rada, uz akademsko mentorstvo i stručne konsultacije autorki. Osmišljen je sa ciljem ispitivanja digitalne pismenosti i samoprocenjene digitalne kompetentnosti nastavnika engleskog jezika u Srbiji i Bosni i Hercegovini u nastavnom, komunikacijskom i refleksivnom domenu. U ovom istraživanju ponovo je primenjen, uz manje izmene radi omogućavanja šireg komparativnog uvida.

Onlajn anketa realizovana putem platforme *Google Forms*, pod nazivom „Digitalna pismenost i digitalne kompetencije nastavnika engleskog jezika kao stranog", sastojala se iz tri celine: demografski podaci (5 pitanja), konceptualno znanje i samoprocena (10 pitanja u formi Likertove skale i pitanja sa višestrukim izborom), kao i pedagoška praksa (7 pitanja koja su obuhvatala višestruki izbor, otvorena pitanja i Likertovu skalu).

Pilot-istraživanje, sprovedeno na uzorku od 30 ispitanika ($N = 30$), potvrdilo je pouzdanost instrumenta. Stavke zasnovane na Likertovoj skali pokazale su visok stepen unutrašnje konzistentnosti u merenju samoprocenjene digitalne kompetentnosti i svesti o značaju digitalne pismenosti.

Ukupno 22 pitanja uključena su u konačnu verziju upitnika. Instrument je razvijen na osnovu relevantnih teorijskih okvira, pri čemu su posebno integrisane dimenzije evropskog okvira DigCompEdu (European Framework for the Digital Competence of Educators) i nacionalnog dokumenta Okvir digitalnih kompetencija – Nastavnik za digitalno doba (Ministarstvo prosvete, nauke i tehnološkog razvoja, 2023). Osmišljen je anonimni onlajn upitnik, koji je distribuiran među 139 nastavnika engleskog jezika kao stranog.

Konačni uzorak čini 86.3% ispitanica ($N = 120$) i 13.7% ispitanika ($N = 19$), pri čemu je većina učesnika starosti između 31 i 50 godina. Ispitanici dolaze iz različitih obrazovnih institucija: 46.8% radi u osnovnim školama, 23% u srednjim školama, 5.8% na univerzitetima, dok je 25.2% zaposleno u privatnim obrazovnim ustanovama. Ostali ispitanici rade onlajn ili kao samostalni saradnici. U pogledu radnog iskustva, 43.9% nastavnika ima više od 13 godina radnog staža.

Prikupljeni podaci analizirani su sa ciljem identifikovanja obrazaca u upotrebi digitalnih alata, u samoprocenjenim digitalnim kompetencijama i u svesti o značaju digitalne pismenosti. Metodologija istraživanja osmišljena je tako da pruži uvid u iskustva aktivnih nastavnika koji u svoj rad integrišu digitalne prakse, ali i da ukaže na prednosti i ograničenja primene digitalnih alata u nastavi. Ovakav pristup omogućio je ispitivanje izazova kao što su digitalni jaz, nejednak pristup tehnologiji, pitanja digitalne bezbednosti i potreba za redovnim i ciljano usmerenim stručnim usavršavanjem nastavnika, radi sigurnije i inovativnije primene digitalnih tehnologija u nastavi engleskog jezika kao stranog.

Upitnik je obuhvatio različite tipove pitanja. Na primer, konceptualno znanje ispitivano je pitanjem sa višestrukim izborom: „Koja od navedenih definicija najbolje opisuje digitalnu kompetenciju?" Samoprocenjena kompetentnost merena je pomoću petostepene Likertove skale (1 = u potpunosti se ne slažem; 5 = u potpunosti se slažem) za tvrdnje poput: „Siguran/sigurna sam u svoju sposobnost da kreiram sopstvene digitalne nastavne

sadržaje za nastavu engleskog jezika kao stranog." Segment koji se odnosio na pedagošku praksu obuhvatao je i pitanje sa višestrukim izborom (Tabela 3), u kojem su ispitanici označavali digitalne alate koje najčešće koriste u nastavi.

Ovo istraživanje zasniva se na dva međusobno povezana i komplementarna pojma: digitalnoj pismenosti, koja podrazumeva sposobnost pristupanja informacijama, njihovog vrednovanja, korišćenja i kreiranja uz pomoć digitalnih tehnologija, i digitalnoj kompetenciji, koja obuhvata tehničke, kognitivne i socijalne veštine neophodne za aktivno učešće u digitalnim okruženjima. Oba pojma smatraju se ključnim za profesionalni razvoj nastavnika.

Rezultati istraživanja: interpretacija i komparativni uvidi

Prvi deo upitnika odnosio se na demografske podatke ispitanika. Drugi deo bio je usmeren na ispitivanje njihovog teorijskog znanja i poznavanja ključnih pojmova. Na pitanje kojim se definiše digitalna pismenost, 97.1% ispitanika (N = 135) odabralo je odgovor „sposobnost pretraživanja, analiziranja, čitanja, pisanja i interakcije u digitalnom okruženju", što je u skladu sa opšteprihvaćenim shvatanjima ovog pojma. Među ostalim ponuđenim odgovorima našli su se „igranje onlajn igara", „pristupanje informacijama na internetu" i „kreiranje digitalnih sadržaja". Ovi odgovori ukazuju na potrebu za ciljanim stručnim usavršavanjem nastavnika kako bi se jasnije razumela uloga digitalne pismenosti u planiranju nastave i podsticanju angažovanja učenika.

Definicije digitalne kompetencije pokazale su veću raznovrsnost. Najveći broj ispitanika, 62.6% (N = 87), opredelio se za definiciju koja digitalnu kompetenciju opisuje kao „slobodno i kritičko korišćenje digitalnih alata u poslovne, rekreativne i komunikacione svrhe", dok je 24.5% ispitanika (N = 34) odabralo odgovor „sposobnost čitanja, pisanja i korišćenja digitalnih sadržaja". Ostali odgovori odražavali su uže razumevanje ovog pojma, povezujući ga prvenstveno sa igranjem igara, pristupom informacijama ili kreiranjem sadržaja. Ovi rezultati ukazuju na to da nastavnici delimično prepoznaju da digitalna kompetencija prevazilazi okvir tehničkih veština i podrazumeva samostalnu, odgovornu i pedagoški svrsishodnu upotrebu digitalnih tehnologija (Reddy et al., 2020b; Zhang & Wu, 2025).

Dobijeni nalazi takođe ukazuju na značajno preklapanje pojmova digitalne pismenosti i digitalne kompetencije, budući da oba podrazumevaju smislenu interakciju u digitalnim okruženjima. Ipak, digitalna kompetencija obuhvata širi spektar kognitivnih, socijalnih i etičkih veština, što ukazuje na potrebu za jasnijim razgraničenjem ovih dvaju koncepata, kako u teoriji tako i u praksi. Većina nastavnika izjasnila se da sebe smatra digitalno pismenim, dok je samo jedan ispitanik izrazio neslaganje sa takvom procenom, što ukazuje na visok nivo samopouzdanja među nastavnicima engleskog jezika kao stranog. Međutim, samoprocena ne mora nužno odražavati stvarnu pedagošku efikasnost. U tom kontekstu, institucionalne inicijative (Ministarstvo prosvete, 2023; UNICEF, 2023) imaju ključnu ulogu u prevazilaženju ovog jaza, dok izveštaj „DC4LT" (Fominykh et al., 2019) na-

glašava potrebu usklađivanja kompetencija nastavnika sa zahtevima poslodavaca i obrazovnim politikama u oblasti nastave jezika.

Tabela 2
Samoprocena digitalne pismenosti nastavnika engleskog jezika kao stranog

Kategorija odgovora	Br. ispitanika	Procenat
Uopšte se ne smatram digitalno pismenom osobom	1	.7%
Ne smatram se dovoljno digitalno pismenom osobom	0	0%
Ne mogu da procenim	37	26.6%
Smatram da sam digitalno pismena osoba	61	43.9%
Smatram da sam u potpunosti digitalno pismena osoba	40	28.8%

Treći deo istraživanja bio je usmeren na ispitivanje načina na koji nastavnici engleskog jezika kao stranog primenjuju digitalne alate i kompetencije u nastavnoj praksi. Ispitanici su mogli da izaberu više ponuđenih odgovora, uključujući platforme, aplikacije, veb-sajtove, igre i kvizove. Kao što je prikazano u Tabeli 3, najčešće korišćeni digitalni alati su veb-sajtovi (68.3%), platforme (66.9%), kvizovi (66.2%) i aplikacije (54.7%), što je u skladu sa širim trendovima koji ukazuju na sklonost ka korišćenju jednostavnih i pristupačnih digitalnih resursa (Hatlevik & Christophersen, 2013; Petko et al., 2018).

Tabela 3
Koje digitalne alate najčešće koristite u nastavi? (moguće je odabrati više odgovora)

Kategorija	Broj odgovora	Procenat
Platforme	93	66.9%
Aplikacije	76	54.7%
Veb-sajtovi	95	68.3%
Igre	52	37.4%
Kvizovi	92	66.2%
Sve navedeno	2	1.4%
Bamboozle, *Kahoot*, digitalni alati	1	.7%
Video-snimci se najčešće koriste	1	.7%
Sve	1	.7%

S druge strane, platforme zasnovane na igrovnim aktivnostima, kao što su *Bamboozle* i *Kahoot*, koristile su se znatno ređe, što može ukazivati na ograničenu dostupnost ovih alata ili na sklonost nastavnika ka tradicionalnijim nastavnim sredstvima. Samo dva ispitanika navela su da koriste sve ponuđene alate, što upućuje na selektivnu i fragmentarnu integraciju digitalnih tehnologija u nastavni proces.

Ovi rezultati ukazuju na potrebu za stručnim usavršavanjem koje bi nastavnicima omogućilo upoznavanje sa širim spektrom digitalnih alata, ali istovremeno i naglasilo njihov pedagoški značaj u razvoju autonomije učenika i formativnom vrednovanju postig-

nuća. Prihvatanje i primena digitalnih tehnologija u velikoj meri zavise od samopouzdanja nastavnika i institucionalne podrške. Sličan jaz između dostupnosti digitalnih alata i njihove efikasne upotrebe (van der Vlies, 2020), kao i između poznavanja alata i njihove strateške integracije u nastavu (Zhang & Wu, 2025), dodatno naglašava značaj ciljano osmišljenih programa stručnog usavršavanja.

Istraživanje je obuhvatilo i učešće nastavnika u programima obuke iz oblasti digitalne pismenosti. Od ukupno 139 ispitanika, 35.3% ($N = 49$) navelo je da je pohađalo takve programe, dok 64.7% ($N = 90$) nije imalo takvo iskustvo. Ispitanici koji su učestvovali u obukama naveli su različite oblike stručnog usavršavanja (Tabela 4), uključujući „Erasmus" programe, institucionalne seminare, vebinare i univerzitetske kurseve. Ovi podaci potvrđuju da mogućnosti za usavršavanje postoje, ali da na učešće mogu uticati faktori poput informisanosti nastavnika, vremenskih ograničenja, institucionalne podrške ili lične motivacije. Prethodna istraživanja pokazuju da sama dostupnost programa nije dovoljna, već da su njihova promocija, relevantnost i podrška institucija od presudnog značaja (Howard et al., 2020; Hennessy et al., 2021).

Iako mnogi nastavnici iskazuju visok stepen samopouzdanja u korišćenju digitalnih alata, relativno nizak procenat formalne obuke postavlja pitanje na koji su način ove kompetencije razvijane. Verovatno je da značajnu ulogu imaju neformalno učenje, saradnja sa kolegama i samostalno usavršavanje, naročito kada su praćeni ličnim angažovanjem i refleksijom o sopstvenoj praksi (Yan et al., 2025). Rezultati pokazuju da je samo 35.3% nastavnika učestvovalo u organizovanim oblicima obuke, dok 64.7% nije učestvovalo. To ukazuje na ograničen obim formalnog profesionalnog razvoja, ali ne nužno i na nedostatak pristupa resursima i mogućnostima za učenje.

Odgovori koji se odnose na obuke iz oblasti digitalne kompetencije i digitalne pismenosti pokazuju raznovrsnost dostupnih programa: nacionalne seminare (Ministarstvo prosvete, 2023; 2019; 2017), univerzitetske kurseve (Ristić, 2019), kao i međunarodne programe poput „Erasmus" projekata i „Cambridge" radionica. Ova raznovrsnost odražava dinamičan razvoj digitalnih kompetencija nastavnika u evropskom obrazovnom prostoru (INTEF, 2017; European Commission, 2018). Ipak, jaz između pohađanja obuka i njihove stvarne primene u nastavnoj praksi potvrđuje nalaze međunarodnih istraživanja. Ngujen i Habok (Nguyen & Habók, 2024) ukazuju da samoprocenjena digitalna pismenost često proizilazi iz neformalnog učenja, dok Hatlevik i Kristofersen (Hatlevik & Christophersen, 2013), kao i Sančez-Krusado i saradnici (Sánchez-Cruzado et al., 2021) naglašavaju da održiv razvoj digitalnih kompetencija zahteva njihovu sistematičnu pedagošku integraciju.

Dobijeni rezultati ukazuju na to da, iako nastavnici pokazuju poverenje u sopstvenu digitalnu pismenost, postoji potreba za čvršćim povezivanjem obrazovnih politika, nastavne prakse i stručnog usavršavanja. Celovit pristup, zasnovan na Okviru digitalnih kompetencija – Nastavnik za digitalno doba (2023) i potkrepljen rezultatima relevantnih istraživanja (Ilić & Bošković Marković, 2020; Seferović, 2023; Veljković Michos et al., 2024), može doprineti prelasku sa jednostavne upotrebe digitalnih alata ka njihovoj pedagoški utemeljenoj i kritički promišljenoj integraciji u nastavu.

Nastavnici su takođe upitani kojoj oblasti digitalnih kompetencija bi trebalo posvetiti veću pažnju kao zasebnom nastavnom predmetu. Ukupno 35.3% ispitanika opredelilo se za sve ponuđene opcije – kreiranje digitalnih sadržaja, strategije za efikasno prenošenje informacija i digitalnu pismenost. Ove oblasti obuhvataju veštine kao što su kreiranje digitalnih materijala, vrednovanje informacija dostupnih na internetu, etičko učešće u digitalnoj komunikaciji i integracija multimodalnih resursa, što je neposredno povezano sa nastavom jezika. Odgovori ispitanika ukazuju na to da nastavnici digitalne kompetencije posmatraju kao međusobno povezane i suštinski važne elemente savremene pedagogije.

Tabela 4

Kada biste mogli da birate, koju od navedenih oblasti biste želeli da vidite kao nastavni predmet u vašoj obrazovnoj ustanovi?

Oblast kompetencije	Procenat
Kreiranje digitalnih sadržaja	23.0%
Strategije za efikasno prenošenje informacija	26.6%
Digitalna pismenost	(manji procenat)
Sve navedene oblasti su važne i trebalo bi da budu uključene u nastavni program ili realizovane kroz dodatne oblike nastave	35.3%

Nastavnici su identifikovali oblasti u okviru digitalnih kompetencija u kojima smatraju da nisu dovoljno osposobljeni. Kao što je prikazano u Tabeli 5, najveći broj ispitanika naveo je digitalnu bezbednost i zaštitu (44.6%) kao oblast u kojoj im je potrebno dodatno usavršavanje, dok je digitalnu pismenost izdvojilo 10.8% ispitanika. Istovremeno, 35.3% nastavnika smatralo je da poseduje adekvatan nivo obučenosti u svim navedenim oblastima. Ovi nalazi u skladu su sa Okvirom digitalnih kompetencija – Nastavnik za digitalno doba (2023), koji obuhvata domene poput informacione pismenosti, komunikacije, kreiranja sadržaja, rešavanja problema i digitalne bezbednosti.

Iako mnogi nastavnici iskazuju poverenje u sopstvene digitalne kompetencije, pitanja bezbednosti i zaštite ostaju jedna od najslabije razvijenih oblasti, što je u skladu sa širim izazovima, koji se odnose na bezbedno i etički odgovorno učešće u digitalnom okruženju (Brown et al., 2016; Nguyen & Habók, 2024; Spires et al., 2018). Dobijeni rezultati ukazuju na potrebu za ciljano usmerenim programima stručnog usavršavanja u oblastima digitalne bezbednosti, digitalne etike i odgovorne upotrebe tehnologija. Pored toga, samoprocenjeni nivo kompetentnosti ne podrazumeva nužno i pedagošku spremnost za primenu digitalnih tehnologija u nastavi, posebno u oblastima koje zahtevaju visok stepen ličnog angažovanja, institucionalnu podršku i kontinuiranu refleksiju o sopstvenoj nastavnoj praksi (Yan et al., 2025).

Tabela 5
U kojim oblastima digitalnih kompetencija smatrate da vam je potrebno dodatno usavršavanje?

Oblast	Procenat
Digitalna pismenost	10.8%
Digitalna bezbednost i zaštita	44.6%
Nijedna od navedenih oblasti	35.3%

Poslednji deo istraživanja bio je posvećen ispitivanju upoznatosti nastavnika sa digitalnim pripovedanjem (digital storytelling), metodom koja kombinuje narativne i multimedijalne elemente sa ciljem unapređivanja fonoloških, gramatičkih i leksičkih kompetencija učenika koji uče engleski jezik kao strani, kroz zajedničko kreiranje priča (Al-Amri, 2020; Seferović, 2023). Više od polovine ispitanika (N = 79) izjavilo je da nije upoznato sa ovim pojmom i da ga ne primenjuje u nastavnoj praksi. Osim toga, većina nastavnika nije poznavala ni alate namenjene digitalnom pripovedanju, što ukazuje na nedovoljnu zastupljenost ove teme u programima stručnog usavršavanja. Ovi nalazi ukazuju na potrebu za ciljano osmišljenim obukama koje bi podržale kreativne pristupe nastavi usmerene na učenika.

Kao multimodalna nastavna strategija, digitalno pripovedanje može da poveže digitalne kompetencije sa inovativnim nastavnim pristupima, čineći nastavu inkluzivnijom, dinamičnijom i podsticajnijom za učenike. Dobijeni rezultati potvrđuju obe postavljene hipoteze istraživanja. Prva hipoteza potvrđuje da nastavnici engleskog jezika kao stranog sebe doživljavaju kao digitalno pismene i kompetentne za upotrebu odabranih digitalnih alata u nastavi, dok druga ukazuje na to da prepoznaju značaj digitalne pismenosti u savremenom obrazovanju. Ipak, rezultati su istovremeno ukazali na postojanje određenih nedostataka u oblasti stručnog usavršavanja i poznavanja savremenih pedagoških strategija.

Rezultati svih segmenata istraživanja naglašavaju potrebu za kontinuiranim i ciljano usmerenim stručnim usavršavanjem nastavnika, posebno u oblasti specijalizovanih digitalnih alata i pristupa, koja obuhvata i digitalno pripovedanje. Takvi programi mogu doprineti transformaciji osnovnih digitalnih veština u inovativne nastavne prakse usmerene na učenika. Razvijene digitalne kompetencije omogućavaju veći stepen angažovanosti učenika, podstiču njihovu autonomiju i doprinose inkluzivnijem pristupu nastavi engleskog jezika kao stranog.

Sledeći rezultati potvrđuju naše dve osnovne hipoteze, koje su zasnovane na visokom stepenu saglasnosti ispitanika u okviru analize frekvencija odgovora.

Tabela 6
Deskriptivna statistika i testiranje hipoteza

Konstrukt (varijabla)	*N*	Aritmetička sredina (*M*)	Standardna devijacija (*SD*)	Tumačenje
Samoprocena (Hipoteza 1)	139	4.00	.789	Potvrđena: aritmetička sredina iznosi tačno 4,00, što na petostepenoj Likertovoj skali odgovara stepenu slaganja.
Svest o značaju digitalne pismenosti (Hipoteza 2)	139	4.331	1.066	Potvrđena: aritmetička sredina je znatno iznad vrednosti 4,00, što ukazuje na visok stepen saglasnosti ispitanika o potrebi za razvojem digitalne pismenosti i kompetencija.

Ukupna prosečna vrednost samoprocene digitalne pismenosti nastavnika iznosila je $M = 4.00$ ($SD = .789$) na petostepenoj skali, što odgovara nivou slaganja sa ponuđenom tvrdnjom. Ovaj rezultat pruža podršku prvoj hipotezi istraživanja i ukazuje na to da nastavnici engleskog jezika kao stranog uglavnom sebe doživljavaju kao digitalno pismene. Visok stepen saglasnosti zabeležen je i kod tvrdnje koja se odnosi na potrebu za daljim razvojem digitalne pismenosti i digitalnih kompetencija kod učenika svih uzrasnih grupa ($M = 4.331$; $SD = 1.066$). Ovaj nalaz pruža snažnu podršku drugoj hipotezi i ukazuje na široko rasprostranjenu svest nastavnika o sve većem značaju digitalnih veština u savremenoj pedagoškoj praksi.

Pored toga, primenjen je t-test za nezavisne uzorke kako bi se ispitale razlike u samoproceni digitalne pismenosti između nastavnika muškog pola ($M = 4.263$; $SD = .810$) i nastavnica ($M = 3.958$; $SD = .786$). Dobijena razlika nije bila statistički značajna ($t(137) = 1.572$; $p = .118$). Iako su nastavnici muškog pola iskazali nešto višu prosečnu vrednost samoprocene, rezultati pokazuju da pol nije značajan prediktor samoprocenjene digitalne pismenosti u ovom uzorku.

Takođe je primenjena jednofaktorska analiza varijanse (*ANOVA*), radi ispitivanja povezanosti između dužine radnog staža i samoprocene digitalne pismenosti nastavnika. Ispitanici su svrstani u četiri kategorije prema godinama radnog iskustva (Tabela 7). Rezultati ukazuju na postojanje granično značajne razlike između posmatranih grupa ($F(3.135) = 2.574$; $p = .057$). Iako dobijena vrednost ne dostiže konvencionalni nivo statističke značajnosti ($p < .05$), rezultati pokazuju jasan trend: nastavnici sa najkraćim radnim stažom (od jedne do tri godine) iskazali su najviši nivo samoprocene digitalne pismenosti ($M = 4.286$), dok su nastavnici sa četiri do sedam godina radnog iskustva zabeležili najnižu prosečnu vrednost ($M = 3.727$). Ovaj nalaz može ukazivati na to da period rane profesionalne karijere (od četiri do sedam godina rada) predstavlja fazu preispitivanja, pritom i realnije procene sopstvenih digitalnih kompetencija u poređenju sa nastavnicima koji tek započinju profesionalni rad.

Tabela 7
Samoprocena digitalne pismenosti nastavnika u zavisnosti od dužine radnog staža

Grupa prema dužini radnog staža	*N*	Aritmetička sredina (*M*)	Standardna devijacija (*SD*)
1 - 3 godine	28	4.286	.810
4 - 7 godina	22	3.727	.827
8 - 12 godina	28	4.107	.786
Više od 13 godina	61	3.918	.737
ANOVA rezultati		F (3, 135) = 2.574, p = .057	

Zaključak

Rezultati ovog istraživanja pokazuju da nastavnici engleskog jezika kao stranog u Srbiji i Bosni i Hercegovini uglavnom sebe doživljavaju kao digitalno pismene i kompetentne za upotrebu odabranih digitalnih alata u nastavi. Ovako procenjen nivo kompetentnosti povezan je sa većom samostalnošću i sigurnošću nastavnika u realizaciji nastavnog procesa. Ipak, integracija digitalnih tehnologija u nastavu nije ujednačena. Dok se platforme i kvizovi široko koriste, alati zasnovani na principima gejmifikacije, kao što su *Bamboozle* i *Kahoot*, ostaju nedovoljno zastupljeni, a poznavanje i primena digitalnog pripovedanja su ograničeni. Najznačajniji uočeni nedostatak odnosi se na oblast digitalne bezbednosti i zaštite, pri čemu je gotovo polovina ispitanika izjavila da nije dovoljno obučena u ovoj oblasti.

Dobijeni rezultati pružaju podršku obema postavljenim hipotezama istraživanja: nastavnici sebe doživljavaju kao digitalno kompetentne i prepoznaju značaj digitalne pismenosti u obrazovanju. Međutim, nalazi istovremeno ukazuju na potrebu za ciljano usmerenim profesionalnim razvojem, posebno u oblastima koje prevazilaze osnovnu upotrebu digitalnih alata i obuhvataju etičku, bezbednu i pedagoški svrsishodnu primenu digitalnih tehnologija. Važno je naglasiti da se nedostatak formalne obuke ne može izjednačiti sa nedostatkom pristupa digitalnim resursima; naprotiv, istraživanje ukazuje na potrebu za stručnim usavršavanjem koje je vidljivo, relevantno i usklađeno sa konkretnim obrazovnim kontekstom. Kao što je definisano u dokumentu Okvir digitalnih kompetencija – Nastavnik za digitalno doba (Ministarstvo prosvete, 2023), digitalnu pismenost treba razumeti kao međupredmetnu kompetenciju, koja obuhvata upravljanje informacijama, kreiranje sadržaja, komunikaciju, saradnju i digitalnu bezbednost – oblasti od posebnog značaja za nastavu engleskog jezika kao stranog. Prednosti ovog istraživanja ogledaju se u raznovrsnosti uzorka i sistematičnom istraživačkom pristupu, ali je neophodno ukazati i na određena ograničenja, poput oslanjanja na samoprocenu ispitanika i izostanka neposrednog posmatranja nastavne prakse.

U celini posmatrano, istraživanje potvrđuje sve veći značaj digitalnih kompetencija u savremenom jezičkom obrazovanju, zatim i ističe stratešku ulogu nacionalnih inicijativa u jačanju spremnosti nastavnika za primenu digitalnih tehnologija. Povezivanjem institucionalnih napora, pedagoških istraživanja i međunarodnih standarda, ova studija doprinosi jasnijem razumevanju načina na koji se digitalna pismenost doživljava i primenjuje u nastavnoj praksi, kao i prepoznavanju pravaca u kojima bi buduće aktivnosti u oblasti obrazovne politike i stručnog usavršavanja trebalo da se razvijaju.

Literatura

Al-Amri, H. M. (2020). Digital storytelling as a communicative language teaching-based method in EFL classrooms. *Arab World English Journal*, *11*(1), 270–281. https://doi.org/10.24093/awej/vol11no1.20

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L. A., & Otto, A. (2022). Teachers' digital competencies in higher education: a systematic literature review. *International journal of educational technology in higher education*, *19*(8), 1-16. https://doi.org/10.1186/s41239-021-00312-8

Brown, C., Czerniewicz, L., Huang, C.-W., & Mayisela, T. (2016). *Curriculum for Digital Education Leadership: A Concept Paper.* Commonwealth of Learning. https://oasis.col.org/items/7795e33d-b199-4913-afcb-dd1874f70b01

European Commission. (2018). *Key competencies for lifelong learning*. https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en

Fominykh, M., Didkovsky, M., Economides, A., Giordano, A., Ivanova, K., Kakoulli-Constantinou, E., Khuzina, M., Menis, E., Nicolaou, A., Parmaxi, A., Perifanou, M., Shikhova, E., Soule, M. V., Talmo, T., Windstein, E., & Zhukova, D. (2019). Digital competences in language education: Teachers' perspectives, employers' expectations, and policy reflections (Technical Report). DC4LT Consortium. https://doi.org/10.13140/RG.2.2.24392.65285

Furber, S. (2012). *Shut down or restart? The way forward for computing in UK Schools*. The Royal Society.

Galindo-Domínguez, H., Delgado, N., Losada, D., & Etxabe, J. M. (2024). An analysis of the use of artificial intelligence in education in Spain: The in-service teacher's perspective. *Journal of digital learning in teacher education*, *40*(1), 41–56. https://doi.org/10.1080/21532974.2023.2284726

Gavranović, V., & Veljković Michos, M. (2022). *Integrating ICT in Language Teaching and Learning. A Guide to Hybrid Teaching*. Singidunum University.

Guillén-Gámez, F. D., Mayorga-Fernández, M. J., Bravo-Agapito, J., & Escribano-Ortiz, D. (2021). Analysis of teachers' pedagogical digital competence: Identification of factors predicting their acquisition. *Technology, Knowledge and Learning*, *26*(3), 481–498. https://doi.org/10.1007/s10758-019-09432-7

Hatlevik, O. E., & Christophersen, K. A. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & education*, *63*, 240–247. https://doi.org/10.1016/j.compedu.2012.11.015

Hennessy, S., D'Angelo, S., McIntyre, N., Koomar, S., Kreimeia, A., Cao, L., Brugha, M., & Zubairi, A. (2021). *Technology, Teacher Professional Development and Low- and Middle-Income Countries: Technical*

report on systematic mapping review [Technical Report]. EdTech Hub. https://doi.org/10.53832/edtechhub.0047

Howard, S. K., Tondeur, J., Siddiq, F., & Scherer, R. (2020). Ready, set, go! Profiling teachers' readiness for online teaching in secondary education. *Technology, Pedagogy and Education*, *30*(1), 141–158. https://doi.org/10.1080/1475939X.2020.1839543

Ilić, D., & Bošković Marković, V. (2020). Teaching in Online Classroom from the Perspective of English Language Teachers. *Primenjena lingvistika*, *21*, 25–44. https://doi.org/10.18485/primling.2020.21.2

Instituto Nacional de Tecnologías Educativas y Formación del Profesorado (INTEF). (2017). *Marco Común de Competencia Digital Docente*. Ministerio de Educación, Cultura y Deporte & Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado. https://bit.ly/2jqkssz

Jokić, S., Marić Jurišin, S., & Perić-Prkosovački, B. (2025). Verification of metric characteristics of the questionnaire "Framework for Digital Competence – Teacher for the Digital Age". *Education and Information Technologies*, *30*(16), 23577-23598. https://doi.org/10.1007/s10639-024-13288-5

Karpati, A. (2011). *Digital literacy in education: Content, Structure, and Development*. UNESCO Institute for Information Technologies in Education. Retrieved from https://coilink.org/20.500.12592/73k74v

Mandić, D., Mišcević, G., Babić, J., & Matović, S. (2024). Educational Robots in Teachers' Education. *Research in Pedagogy*, *14*(2), 361–376. https://doi.org/10.5937/IstrPed2402361M

Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. (2017). *Okvir digitalnih kompetencija — Nastavnik za digitalno doba*.

Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. (2019). *Okvir digitalnih kompetencija — Nastavnik za digitalno doba*.

Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. (2023). *Okvir digitalnih kompetencija — Nastavnik za digitalno doba*. Zavod za vrednovanje kvaliteta obrazovanja i vaspitanja. https://ceo.edu.rs/okvir-digitalnih-kompetencija-2023/

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). AI literacy: Definition, teaching, evaluation, and ethical issues. *Proceedings of the Association for Information Science and Technology*, *58*(1), 504-509. https://doi.org/10.1002/pra2.487

Nguyen, L. A. T., & Habók, A. (2024). Tools for assessing teacher digital literacy: a review. *Journal of Computers in Education*, *11*(1), 305–346. https://doi.org/10.1007/s40692-022-00257-5

Petko, D., Prasse, D., & Cantieni, A. (2018). The interplay of school readiness and teacher readiness for educational technology integration: A structural equation model. *Computers in the Schools*, *35*(1), 1–18. https://doi.org/10.1080/07380569.2018.1428007

Reddy, P., Sharma, B., & Chaudhary, K. (2020a). Digital literacy: A review of literature. *International Journal of Technoethics*, *11*(2), 65–94. https://doi.org/10.4018/IJT.20200701.oa1

Reddy, P., Sharma, B., & Chaudhary, K. (2020b). Measuring the digital competency of freshmen at a higher education institute. *Proceedings of the 24th Pacific Asia Conference on Information Systems (PACIS 2020)* (Article 6). Association for Information Systems. https://aisel.aisnet.org/pacis2020/6

Ristić, M. (2019). Model digitalnog nastavnog okruženja za strani jezik struke. *Inovacije u nastavi*, *32*(2), 106–121. https://doi.org/10.5937/inovacije1902106R

Sánchez-Cruzado, C., Santiago Campión, R., & Sánchez-Compaña, M. T. (2021). Teacher digital literacy: The indisputable challenge after COVID-19. *Sustainability*, *13*(4), 1858. https://doi.org/10.3390/su13041858

Seferović, S. (2023). *Digital literacy in the English language learning process: Helping tools for promoting digital literacy* (Master's thesis). Sinergija University.

Silvhiany, S., Huzaifah, S., & Ismet, I. (2021). Critical digital literacy: EFL students' ability to evaluate online sources. *Indonesian Journal of EFL and Linguistics*, *6*(1), 249-269. https://doi.org/10.21462/ijefl.v6i1.364

Spires, H. A., Paul, C. M., & Kerkhoff, S. N. (2018). Digital literacy for the 21st century. In M. Khosrow-Pour (Ed.), *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 2235–2242). IGI Global Scientific Publishing. https://doi.org/10.4018/978-1-5225-7659-4.ch002

Su, J., & Yang, W. (2022). Artificial Intelligence in Early Childhood Education: A Scoping Review. *Computers and Education: Artificial Intelligence*, *3*, 1-13. https://doi.org/10.1016/j.caeai.2022.100049

Su, J., D. T. K., Ng, & Chu, S. K. W. (2023). Artificial Intelligence (AI) Literacy in Early Childhood Education: The Challenges and Opportunities. *Computers and Education: Artificial Intelligence*, *4*(1), 1-14. https://doi.org/10.1016/j.caeai.2023.100124

UNESCO. (2024). *AI competency framework for teachers*. https://unesdoc.unesco.org/ark:/48223/pf0000391104

UNICEF. (2023). *University of Sarajevo launching a platform to improve the digital and pedagogical competencies of teachers*. https://www.unicef.org/bih/en/press-releases/university-sarajevo-launching-platform-improve-digital-and-pedagogical-competencies

van der Vlies, R. (2020). *Digital strategies in education across OECD countries: Exploring education policies on digital technologies (OECD Education Working Papers No. 226)*. OECD Publishing. https://doi.org/10.1787/33dd4c26-en

Veljković Michos, M., & Bošković Marković, V. (2020). Teachers' perception of the use of ICT in foreign language teaching at a higher education institution. *Sinteza 2020 - International Scientific Conference on Information Technology and Data Related Research* (pp. 93–98). Singidunum University. https://doi.org/10.15308/Sinteza-2020-93-98

Veljković Michos, M., Pupovac, M., Lunić, D., Nikolić, J., & Čolović, M. (2024). The Effectiveness of Presentations in Higher Education: Teacher and Student Perspectives. *Sinteza 2024 - International Scientific Conference on Information Technology, Computer Science, and Data Science* (pp. 316-321). Singidunum University. https://doi.org/10.15308/Sinteza-2024-316-321

Weisberg, L., Wang, X., Wusylko, C., & Kohnen, A. (2023). Critical Online Information Evaluation (COIE): A comprehensive model for curriculum and assessment design. *Journal of Media Literacy Education*, *15*(1), 14–30. https://doi.org/10.23860/JMLE-2023-15-1-2

Yalçin, T., & Bozyiğit, E. (2023). A review of studies on digital competence in teaching English as a foreign language. *Studies in Linguistics, Culture, and FLT*, *11*(3), 82-101. https://doi.org/10.46687/ANKN3258

Yan, Z., Shen, Z., Yuan, H., Wu, Z., & Tang, X. (2025). The relationship between teachers' digital literacy and teaching competence: the chain mediating role of psychological capital and learning engagement. *Education and Information Technologies*, *30*(17), 25059-25079.

Zhang, J., & Wu, Y. (2025). Impact of university teachers' digital teaching skills on teaching quality in higher education. *Cogent Education*, *12*(1), 1-15. https://doi.org/10.1080/2331186X.2024.2436706

Primljeno: 12.08.2025.
Korigovana verzija primljena: 14.01.2026.
Prihvaćeno za štampu: 20.03.2026.

Maja Veljković Michos
Univerzitet Singidunum, Beograd, Srbija
https://orcid.org/0000-0003-2931-6554

Valentina Bošković Marković
Univerzitet Singidunum, Beograd, Srbija
https://orcid.org/0000-0001-8873-6706

Sacmir Seferović
Univerzitet Sinergija, Bijeljina, Bosna i Hercegovina
https://orcid.org/0009-0001-6438-2330

Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Nastava i vaspitanje, 2026, *75*(2), 373-391
https://doi.org/10.5937/niv75-64939

ISSN 0547-3330
eISSN 2560-3051
Originalni naučni rad

Vršnjačka povratna informacija i usmeno izlaganje u nastavi engleskog jezika struke: percepcije studenata i pedagoške implikacije

Mirna Vidaković[1]
Ekonomski fakultet u Subotici, Univerzitet u Novom Sadu, Subotica, Srbija

Apstrakt *Iako se smatra jednom od ključnih kompetencija svršenih studenata i stručnjaka, veštini usmenog izlaganja se i dalje ne pridaje dovoljna pažnja u visokom obrazovanju. S obzirom na to da vršnjačka povratna informacija zauzima sve značajnije mesto u savremenom pedagoškom diskursu, ovaj rad sagledava njen potencijal za unapređenje veštine usmenog izlaganja studenata. U istraživanju, sprovedenom u kontekstu engleskog jezika struke, ispituju se iskustva davalaca i primalaca povratne informacije u pogledu prednosti i izazova ovog pristupa, kao i njegovog uticaja na kvalitet usmenog izlaganja. Cilj je formulisanje smernica za uspešnu integraciju vršnjačke povratne informacije u nastavnu praksu. Uzorak čini 60 studenata prve godine koji su pohađali predmet Engleski jezik za ekonomiste. Oni su, po završetku aktivnosti, popunili upitnik koji je sadržao pitanja višestrukog izbora, otvorenog tipa i Likertove skale. Kvantitativni i kvalitativni podaci analizirani su primenom deskriptivne statistike, Men–Vitnijevog testa i tematske analize sadržaja. Rezultati ukazuju na pozitivne stavove prema vršnjačkoj povratnoj informaciji, naročito kod onih ispitanika koji su preuzeli obe uloge. Učesnici u istraživanju su ovaj pristup prepoznali kao koristan za razvoj veštine usmenog izlaganja, kritičkog mišljenja, refleksije i samoregulisanog učenja. Uočeni su i izazovi u pogledu kvaliteta povratne informacije, emocionalne nelagodnosti, angažovanosti studenata i vremenskih ograničenja. Istraživanje naglašava značaj pažljivo osmišljenih nastavnih aktivnosti i istovremenog sagledavanja kognitivnih, socijalnih i afektivnih dimenzija prilikom uvođenja vršnjačke povratne informacije u proces učenja.*

Ključne reči: *vršnjačka povratna informacija, davalac povratne informacije, primalac povratne informacije, visoko obrazovanje, veština usmenog izlaganja.*

1 mirna.vidakovic@ef.uns.ac.rs

Uvod

Veština usmenog izlaganja danas se smatra jednim od ključnih atributa studenata i stručnjaka (Murillo-Zamorano & Montanero, 2018; Palmour, 2026; van Ginkel et al., 2015, 2017). Međutim, obrazovne institucije neretko zanemaruju razvoj znanja i veština neophodnih za uspešno izlaganje ili primenjuju neefikasne pristupe (Murillo-Zamorano & Montanero, 2018; Palmour, 2026; van Ginkel et al., 2015, 2017). Naime, veština usmenog izlaganja se uglavnom podrazumeva ili podučava kroz tradicionalne, preskriptivne oblike nastave i ocenjivanja, koji zapostavljaju aktivnu ulogu studenata i ograničavaju mogućnosti za vežbanje i dobijanje pravovremene i individualno prilagođene povratne informacije (Prosenjak & Lučev, 2020; Qaiser et al., 2022; Zareva, 2009). Jedna od često navođenih definicija određuje ovaj konstrukt kao „kombinaciju znanja, veština i stavova neophodnih za javno nastupanje radi informisanja, samoizražavanja, uspostavljanja odnosa i ubeđivanja" (De Grez, 2009, str. 5), čime se naglašava njegova složenost i međusobna povezanost kognitivne, bihejvioralne i afektivne dimenzije (van Ginkel et al., 2015).

Tokom poslednje dve decenije sve više se potvrđuje efikasnost vršnjačke povratne informacije kao strategije za razvoj komunikativne kompetencije studenata. Ovaj oblik saradničkog učenja podstiče smisleno angažovanje i preuzimanje odgovornosti za sopstveno učenje, te je u skladu sa principima socijalno-konstruktivističke pedagogije. Osim toga, on doprinosi razvoju metakognitivnih, interpersonalnih i drugih profesionalnih veština (Adachi et al., 2017; Ardill, 2025; Carless & Boud, 2018; Jerotijević Tišma, 2016; Stančić, 2020; Topping, 2017; Zamorano et al., 2025), čime se povećavaju izgledi za zapošljavanje i napredovanje mladih stručnjaka.

Međutim, vršnjačka povratna informacija nije dovoljno zastupljena niti istražena u obrazovanju u Srbiji. Malobrojne studije bave se ovim fenomenom u kontekstu veštine pisanja (Anđelković, 2022; Čorbić, 2024; Prodanović Stankić, 2017), dok je, prema saznanjima autorke, samo jedan rad ispitivao vršnjačko ocenjivanje govorne produkcije i poredio ga sa nastavničkim ocenjivanjem (Jerotijević Tišma, 2016). Stoga, s ciljem unapređenja naučnih saznanja i pedagoške prakse, ovaj rad razmatra primenu vršnjačke povratne informacije u kontekstu razvoja veštine usmenog izlaganja studenata. Istraživanje je sprovedeno u okviru predmeta Engleski jezik za ekonomiste i ispituje iskustva studenata kao davalaca i/ili primalaca povratne informacije, te analizira njihova shvatanja benefita, izazova i uticaja ovog pristupa na veštinu usmenog izlaganja. Dobijeni rezultati rasvetljavaju ključne aspekte datog procesa, omogućavaju njegovo potpunije razumevanje i pružaju značajne pedagoške implikacije za primenu vršnjačke povratne informacije i van konteksta nastave engleskog jezika struke.

Pregled literature

Vršnjačka povratna informacija predstavlja „aktivnost učenja u kojoj pojedinci ili male grupe razmenjuju informacije o učinku na određenom zadatku, reaguju na njih i/ili

postupaju u skladu sa njima, s ciljem ostvarivanja eksplicitnih ili implicitnih zajedničkih i individualnih ciljeva učenja" (Alqassab et al., 2018, str. 12). U procesu vršnjačke povratne informacije, studenti mogu preuzeti ulogu davaoca i/ili primaoca povratne informacije. Svaka od ovih uloga podrazumeva specifičnu dinamiku interakcije i ishode učenja, što nastavnici treba da prepoznaju kako bi efikasno usmeravali ovaj proces (Zamorano et al., 2025). U nastavku će biti razmotrena ključna pitanja koja proizilaze iz navedenih uloga, kao i dosadašnji nalazi o uticaju vršnjačke povratne informacije na veštinu i uspešnost usmenog izlaganja.

Davaoci vršnjačke povratne informacije: koristi i izazovi

Studenti koji daju povratnu informaciju „koriste svoja znanja i veštine kako bi analizirali, razjasnili i korigovali rad kolega" (Kim, 2009, str. 105). Ovoj ulozi dugo nije posvećivana dovoljna pažnja, a novija istraživanja ukazuju na to da i nastavnici i studenti smatraju čin davanja povratne informacije izuzetno korisnim u pogledu angažovanosti, ishoda učenja i razvoja veština (Adachi et al., 2017; Ardill, 2025; Murillo-Zamorano & Montanero, 2018; Nicol et al., 2013). Pojedini autori je čak smatraju korisnijom od samog primanja povratne informacije (Lundstrom & Baker, 2009; Nicol et al., 2013).

Kada je reč o prednostima, autori ističu da davanje vršnjačke povratne informacije unapređuje kritičko mišljenje i evaluativno rasuđivanje, samoregulisano učenje, refleksiju, komunikativne i interpersonalne veštine, te poboljšava učinak na konkretnoj aktivnosti (Ardill, 2025; Nicol et al., 2013; Prodanović Stankić, 2017; Winstone & Carless, 2020). Studenti navode da su kroz ovaj proces razvili strategije za analizu i vrednovanje, te produbili razumevanje kriterijuma ocenjivanja (Nicol et al., 2013; Winstone & Carless, 2020), što je doprinelo većoj autonomiji u učenju (Ardill, 2025). Vršnjačka povratna informacija takođe redefiniše odnose između nastavnika i studenata (Ardill, 2025). Stančić (Stančić, 2020) ističe da učešće studenata u procesu donošenja odluka doprinosi njihovom osećaju uvaženosti.

Međutim, davaoci povratne informacije suočavaju se i sa izazovima. Studenti mogu smatrati da ne poseduju dovoljno predmetnog i jezičkog znanja za pružanje kvalitetne povratne informacije (Ardill, 2025; De Grez et al., 2012; Stančić, 2020; Zhan, 2024). Na primer, Džan (Zhan, 2024, str. 7) jeste uočio da su studenti „bili zabrinuti zbog svoje sposobnosti da precizno formulišu komentare na engleskom jeziku", zbog čega su izbegavali da iznose zapažanja koja nisu umeli jasno da iskažu. U Ardilovom (Ardill, 2025) istraživanju, ispitanici su posebno naglasili značaj jasnih uputstava i ciljeva za davanje vršnjačke povratne informacije. Prema Adači i saradnicima (Adachi et al., 2017, str. 8), „studenti se manje angažuju u samovrednovanju i vršnjačkom ocenjivanju ukoliko taj čin ne doživljavaju kao svoj i ne razumeju zašto se to od njih očekuje". Nedovoljno angažovanje davalaca povratne informacije može demotivisati njihove vršnjake (Nicol et al., 2013; Zhou et al., 2020).

U literaturi se takođe ukazuje na pitanja nelagodnosti i pristrasnosti. Studenti se mogu osećati neprijatno prilikom kritikovanja rada svojih kolega (Ardill, 2025; Stančić, 2020; Topping, 2017), posebno kada povratna informacija utiče na konačnu ocenu. Kajser i saradnici (Qaiser et al., 2022) i Prosenjak i Lučev (Prosenjak & Lučev, 2020) su uočili da neki studenti daju visoke ocene iz straha od narušavanja odnosa sa vršnjacima. U kontekstu obrazovanja u Srbiji, Čorbić (Čorbić, 2024, str. 100) ovaj fenomen povezuje sa kolektivističkom kulturom, koju odlikuju „izražena težnja ka izbegavanju neizvesnosti i solidarnost."

Primaoci vršnjačke povratne informacije: koristi i izazovi

Za razliku od uloge davalaca, perspektiva primalaca povratne informacije znatno je više ispitivana. Istraživanja pokazuju da studenti, kao primaoci povratne informacije, „unapređuju svoj učinak na zadatku, veštine samoregulisanog učenja i kritičkog mišljenja" (Tsivitanidou & Constantinou, 2016; Zamorano et al., 2025, str. 2). Oni povratnu informaciju kolega smatraju pristupačnijom i razumljivijom od nastavničke, što se objašnjava zajedničkim jezikom i iskustvima (Adachi et al., 2017; Ardill, 2025). Razmatrajući povratne informacije dobijene od većeg broja vršnjaka, studenti stiču širi uvid u sopstveni rad i razvijaju kritičko mišljenje i refleksivne veštine (Ardill, 2025; Nicol et al., 2013). Čo i Makartur (Cho & MacArthur, 2011) uočili su da veći broj povratnih informacija podstiče njihovo usvajanje i primenu.

Studije, međutim, upućuju i na to da različiti izazovi mogu otežati proces usvajanja povratne informacije. Studenti ispoljavaju skepticizam prema sposobnosti svojih vršnjaka da pruže konstruktivnu i korisnu povratnu informaciju (Ardill, 2025; van Ginkel et al., 2017), navodeći da je ona ponekad suviše uopštena, površna ili nejasna (Nicol et al., 2013; Stančić et al., 2024; Zhan, 2024), što može otežati korekciju rada i negativno se odraziti na kvalitet konačnog proizvoda.

Često navođen izazov jeste i nedostatak spremnosti za usvajanje dobijene povratne informacije (Price et al., 2010; Zhan, 2024). Uzroci se mogu naći u prethodnom iskustvu studenata, emocionalnom otporu, uverenju da povratna informacija neće uticati na konačnu ocenu, pa čak i u lenjosti (Price et al., 2010; Zhan, 2024). Džan (Zhan, 2024), takođe zapaža da je emocionalni otpor naročito izražen kada studenti dobiju kritiku.

Na kraju pregleda o koristima i izazovima vršnjačke povratne informacije iz perspektive različitih uloga, važno je naglasiti da su se dosadašnja istraživanja uglavnom bavila davaocima i primaocima povratne informacije odvojeno, ponekad čak ne razlikujući ove uloge (Zamorano et al., 2026). Uz to, znatno veća pažnja posvećena je perspektivi primalaca povratne informacije. Stoga je potrebno dodatno ispitati iskustva studenata koji preuzimaju obe uloge u okviru istog ciklusa vršnjačke povratne informacije, jer takav pristup omogućava sveobuhvatnije razumevanje potencijala ove pedagoške prakse.

Uticaj vršnjačke povratne informacije na veštinu izlaganja

Uprkos ograničenom obimu, istraživanja koja se bave uticajem vršnjačke povratne informacije na veštinu usmenog izlaganja pružaju značajne nalaze.

Van Ginkel i saradnici (van Ginkel et al., 2015, 2017) su uočili prednost nastavničkog ocenjivanja u odnosu na vršnjačko i samoocenjivanje kada je reč o ponašanju tokom usmenog izlaganja, dok je na kognitivnom i afektivnom planu ustanovljen napredak nezavisno od izvora povratne informacije. Nasuprot tome, Muriljo-Zamorano i Montanero (Murillo-Zamorano & Montanero, 2018, str. 141) konstatovali su da vršnjačka povratna informacija praćena rubrikama za ocenjivanje (eng. *rubrics*) i diskusijom može imati veći uticaj na kvalitet usmenog izlaganja od tradicionalne nastavničke povratne informacije, budući da ovi elementi obezbeđuju „strukturisan okvir za socijalizaciju i refleksiju". Ispitanici u njihovom istraživanju su ostvarili značajan napredak, kako u pogledu sadržaja prezentacije (uvod i struktura), tako i izražajnosti (verbalna i neverbalna komunikacija). Autori (Gudiño et al., 2024; Murillo-Zamorano & Montanero, 2018) takođe su istakli da jednokratna obuka za primenu rubrika nije dovela do trajnih efekata, što ukazuje na potrebu za sistematičnim i kontinuiranim osposobljavanjem. S druge strane, Urena-Rodrigez i saradnici (Urena-Rodriguez et al., 2025), kao i Dej i saradnici (Day et al., 2021) nisu utvrdili poboljšanje govorničkih veština i usmenog izlaganja. Dej i saradnici (Day et al., 2021) ovakav ishod dovode u vezu sa izostankom konkretnih smernica za njegovo unapređenje (eng. *feed forward*).

Kada je reč o uticaju vršnjačke povratne informacije na različite aspekte veštine usmenog izlaganja, Dikson i saradnici (Dickson et al., 2019) i Prosenjak i Lučev (Prosenjak & Lučev, 2020) zabeležili su napredak u ocenama studenata, razumevanju kriterijuma ocenjivanja, uverljivosti izlaganja i samopouzdanju, kao i smanjenje anksioznosti. King i saradnici (King et al., 2000, str. 365) pokazali su da je trenutna povratna informacija efikasnija za aspekte prezentacije koji se mogu trenutno uočiti, kao što je kontakt očima, dok se odložena povratna informacija pokazala korisnijom za „promišljenu i svesnu obradu informacija", kao što je prilagođavanje dužine uvodnog dela prezentacije.

Uopšteno govoreći, nalazi ukazuju na potrebu za daljim ispitivanjima u oblasti vršnjačke povratne informacije, ne samo zbog ograničenog broja istraživanja već i neujednačenih empirijskih rezultata. Dosadašnje studije upućuju na to da efikasnost ovog pristupa u velikoj meri zavisi od načina na koji je osmišljen. Stoga je potrebno utvrditi koje nastavne komponente doprinose ostvarivanju pozitivnih ishoda učenja.

Istraživanje predstavljeno u nastavku rada oslanja se na ključne teme i zapažanja proistekla iz navedenih studija, ali istovremeno ostavlja prostor za identifikovanje novih aspekata koji mogu doprineti potpunijem razumevanju uloge vršnjačke povratne informacije u razvoju veštine usmenog izlaganja.

Metodologija istraživanja

Kontekst istraživanja

Istraživanje je sprovedeno u okviru predmeta Engleski jezik za ekonomiste, koji pohađaju studenti prve godine osnovnih akademskih studija. Usmeno izlaganje predstavlja obaveznu nastavnu aktivnost koja ulazi u strukturu konačne ocene. Polazeći od uočenih nedostataka u načinu na koji studenti drže prezentacije, kao i ograničene efikasnosti tradicionalnih nastavnih pristupa, autorka je odlučila da u nastavni proces integriše vršnjačku povratnu informaciju s ciljem unapređenja veštine usmenog izlaganja. Ovaj poduhvat manjeg obima sproveden je u tri faze tokom nekoliko nedelja nastave. Održana su dva ciklusa: prvi tokom letnjeg semestra školske 2022/2023. godine, a drugi tokom letnjeg semestra školske 2023/2024. godine. Prema tome, obuhvaćene su dve generacije studenata prve godine. U nastavku su prikazane faze projekta:

1. Obuka: Studenti su učestvovali u obuci za usmeno izlaganje i davanje vršnjačke povratne informacije. U okviru obuke u domenu vršnjačke povratne informacije, upoznati su sa rubrikama koje su koristili za ocenjivanje izlaganja svojih kolega. Rubrike su obuhvatile sledeće kategorije: izlagač, struktura izlaganja, komunikativni stil i vizuelni elementi prezentacije. Svaka kategorija sadržala je više kriterijuma. Tako su, na primer, u okviru kategorije izlagač vrednovani pripremljenost govornika, zainteresovanost za temu i sposobnost uključivanja publike, dok su u okviru komunikativnog stila procenjivani tečnost, jezička tačnost, izgovor i govor tela. Po završetku obuke, studenti su pozvani da pripreme petominutna izlaganja na temu iz svoje discipline, koja su potom bila predmet vršnjačkog vrednovanja. Učešće u ulozi izlagača bilo je dobrovoljno, a broj je bio ograničen na deset studenata po grupi. Od izlagača se očekivalo da učestvuju u dva kruga izlaganja.

2. Prvi krug izlaganja: Izlagači su održali svoja izlaganja, nakon čega su dobili pisanu vršnjačku povratnu informaciju s ciljem da ih unaprede. Davaoci povratne informacije su, radeći u parovima, za svaki kriterijum u rubrikama birali odgovarajuću opciju (prisutno, nije prisutno, potrebno unapređenje) i davali konkretne, konstruktivne komentare i preporuke. Po završetku aktivnosti, izlagači su prikupili dobijene povratne informacije.

3. Drugi krug izlaganja: Izlagači su održali svoja korigovana izlaganja koja je nastavnik ocenjivao koristeći iste rubrike za ocenjivanje koje su prethodno upotrebljene u procesu vršnjačke povratne informacije. Za učešće u aktivnosti izlagači su dobili dodatne bodove.

Svi izlagači su preuzimali i ulogu davaoca povrante informacije (ali nisu učestvovali u samoocenjivanju), dok su ostali studenti učestvovali isključivo kao davaoci povratne informacije. Zahvaljujući utvrđenoj strukturi aktivnosti, svi studenti su učestvovali pod istim uslovima. Po završetku aktivnosti, učesnici su popunili upitnik čiji su cilj, struktura i rezultati predstavljeni u ovom radu.

Cilj

Istraživanje je osmišljeno sa ciljem ispitivanja stavova i iskustava studenata u vezi sa primenom vršnjačke povratne informacije kao sredstva za unapređenje veštine usmenog izlaganja. Ono je obuhvatilo sledeća istraživačka pitanja:

- Kako studenti doživljavaju proces davanja vršnjačke povratne informacije i kakva su njihova iskustva u vezi sa navedenim procesom?
- Kako izlagači doživljavaju dobijenu vršnjačku povratnu informaciju i kakva su njihova iskustva u vezi sa navedenim procesom?
- Kako studenti u celini poimaju pristup zasnovan na vršnjačkoj povratnoj informaciji u pogledu njegovih benefita, ograničenja i nedostataka?
- Da li postoji statistički značajna razlika između studenata koji su imali različite uloge (davaoci povratne informacije naspram studenata koji su preuzimali ulogu davaoca i primaoca) u pogledu stavova o integraciji vršnjačke povratne informacije u redovnu nastavnu praksu i zadovoljstva sprovedenom aktivnošću?

Rezultati pružaju značajne pedagoške uvide koji mogu doprineti efikasnijoj primeni vršnjačke povratne informacije u nastavi.

Uzorak

Uzorak je obuhvatio 60 studenata prve godine osnovnih studija, od kojih je po 30 pohađalo predmet Engleski jezik za ekonomiste tokom školske 2022/2023. i 2023/2024. godine. Primenjen je pristup namernog uzorkovanja, budući da su relevantni podaci mogli da budu prikupljeni isključivo od studenata koji su učestvovali u aktivnosti vršnjačke povratne informacije. Među ispitanicima je bilo 61.67% studentkinja i 36.67% studenata, dok 1.67% nije želelo da se izjasni o polu. Znanje engleskog jezika, utvrđeno na osnovu Oksfordskog dijagnostičnog testa (Oxford Placement Test) sprovedenog na početku semestra, uglavnom je bilo na nivoima B2 (30%) i C1 (38.33%) Zajedničkog evropskog referentnog okvira za jezike. Zastupljeni su bili i drugi nivoi, ali u manjem postotku (A1: 6.67%; A2: 1.67%; B1: 16.67%; C2: 6.67%). Kada je reč o ulogama u aktivnosti, 71.66% studenata je vršilo ulogu izlagača i davaoca povratne informacije, dok je preostalih 28.33% preuzelo ulogu davaoca povratne informacije.

Istraživački instrument i obrada podataka

Za potrebe istraživanja konstruisan je anonimni onlajn upitnik (Microsoft Forms), zasnovan na relevantnim istraživanjima iz ove oblasti (Huisman et al., 2018; Strijbos et al., 2010). Upitnik je sproveden tokom školske 2022/2023. i 2023/2024. godine. Studenti su bili informisani o cilju istraživanja i dobrovoljnoj prirodi učešća. Upitnik se sastojao iz dva

dela. Prvi je obuhvatio tri pitanjavišestrukog izbora, čiji je cilj bio prikupljanje opštih podataka o ispitanicima: pol, nivo znanja engleskog jezika prema Zajedničkom evropskom referentnom okviru za jezike i uloga u aktivnosti vršnjačke povratne informacije. Drugi deo, koji je sadržao četiri petostepene Likertove skale, jedno pitanje višestrukog izbora i tri pitanja otvorenog tipa, bio je fokusiran na ključne teme istraživanja. Ova pitanja su bila grupisana u tri kategorije:

- percepcije i iskustva u vezi sa davanjem povratne informacije (jasnoća uputstava i kriterijuma, samopouzdanje davalaca povratne informacije, benefiti davanja povratne informacije, teškoće sa kojima su se studenti suočavali tokom ovog procesa);
- percepcije i iskustva u vezi sa korišćenjem dobijene povratne informacije (tačnost i korisnost povratne informacije, spremnost na unapređenje veštine usmenog izlaganja, uticaj povratne informacije na kvalitet usmenog izlaganja); i
- opšta ocena aktivnosti vršnjačke povratne informacije u pogledu njenih prednosti, ograničenja i nedostataka; mogućnosti integracije aktivnosti u redovnu nastavnu praksu i zadovoljstvo studenata.

Visok stepen pouzdanosti Likertovih skala potvrđen je Kronbahovim koeficijentom *α*, koji je iznosio .885 za četvrto pitanje sa četiri tvrdnje i .816 za šesto pitanje sa pet tvrdnji.

Analiza podataka sprovedena je u programskom paketu SPSS 20. Kvantitativni podaci analizirani su primenom deskriptivne statistike: frekvencije, procenti, medijana i standardna devijacija (*SD*). Za ispitivanje statističkih razlika u stavovima studenata o integraciji vršnjačke povratne informacije u redovnu nastavnu praksu, kao i u stepenu zadovoljstva aktivnošću u zavisnosti od uloge koju su imali, primenjen je Men–Vitnijev test. Ovaj test je izabran jer su podaci dobijeni Likertovim skalama pokazivali asimetriju udesno. Uz to, s obzirom na nejednaku veličinu grupa (izlagači i davaoci povratne informacije: 43; davaoci povratne informacije: 17) i kršenje pretpostavke normalnosti raspodele, neparametarski pristup zasnovan na rangovima pruža pouzdanije rezultate.

Kvalitativni podaci analizirani su primenom tematske analize sadržaja, koja je obuhvatila kodiranje odgovora i identifikovanje tematskih celina. Upotreba mešovitog pristupa omogućila je detaljnije sagledavanje ključnih pitanja povezanih sa vršnjačkom povratnom informacijom, kao i uočavanje dodatnih nalaza koji su se pojavili tokom analize. Kvalitativni podaci korišćeni su i za objašnjavanje i kontekstualizaciju kvantitativnih rezultata, čime je unapređen njihov interpretativni potencijal i, posledično, validnost istraživanja.

Rezultati i diskusija

U prvom istraživačkom pitanju, studenti su zamoljeni da iskažu stepen slaganja, odnosno neslaganja sa tvrdnjama o davanju povratne informacije (Tabela 1).

Tabela 1
Percepcije studenata u vezi sa davanjem povratne informacije

Tvrdnja	Ne slažem se uopšte	Ne slažem se	Niti se slažem, niti se ne slažem	Slažem se	Slažem se u potpunosti	*Medijana*	*SD*
1. Dobio/la sam jasna i dovoljno detaljna uputstva za davanje povratne informacije.	1.67%	1.67%	8.33%	30.00%	58.33%	5	.850
2. Kriterijumi za davanje povratne informacije bili su jasno definisani u obrascu.	1.67%	3.33%	10.00%	36.67%	48.33%	4	.899
3. Umem da pružim kvalitetnu povratnu informaciju.	1.67%	5.00%	21.67%	48.33%	23.33%	4	.892
4. Smatram da je davanje povratne informacije korisno.	1.67%	3.33%	11.67%	40.00%	43.33%	4	.898

Većina ispitanika smatra da je dobila adekvatna uputstva za učešće u ovoj aktivnosti i prepoznala je vrednost davanja vršnjačke povratne informacije, pri čemu je više od 80% studenata iskazalo slaganje sa tvrdnjama 1, 2 i 4. Pozitivan stav studenata prema povratnoj informaciji predstavlja jedan od ključnih faktora njihovog angažovanja u ovom procesu (Huisman et al., 2018). Čak 85% učesnika u istraživanju je navelo da razume kriterijume u rubrikama za ocenjivanje, što predstavlja važan preduslov za unapređenje kvaliteta povratne informacije, pa time i kvaliteta izlaganja. Muriljo-Zamorano i Montanero (Murillo-Zamorano & Montanero, 2018) takođe su konstatovali da rubrike preusmeravaju pažnju studenata sa samih izlagača na izlaganje i mogućnosti njegovog unapređenja. Nešto manji, ali i dalje visok procenat ispitanika (71.66%) veruje da su sposobni da pruže kvalitetnu povratnu informaciju. Iako je ovaj nalaz u skladu sa prethodnim, on istovremeno ukazuje na to da je određenom broju studenata potrebno dodatno uvežbavanje za sticanje kompetencija i samopouzdanja neophodnih za vrednovanje rada svojih vršnjaka. U literaturi se naglašava značaj podrške tokom primene pristupa vršnjačke povratne informacije kroz upotrebu rubrika, kontinuirano vođenje i potporu nastavnika (Ardill, 2025; Gudiño et al., 2024; Murillo-Zamorano & Montanero, 2018; Zhe Dong et al., 2023), jer doprinosi dubljem

razumevanju samog procesa, razvoju pismenosti u domenu povratne informacije (eng. *feedback literacy*) i jačanju poverenja u sposobnost vršnjaka da daju kvalitetnu povratnu informaciju.

Cilj drugog pitanja bio je da ispita teškoće sa kojima su se studenti susretali prilikom davanja povratne informacije. Ispitanici su mogli da odaberu više ponuđenih odgovora, kao i da navedu sopstveni ukoliko ponuđene opcije nisu odražavale njihovo iskustvo. Pošto su procenti iskazani za svaku opciju pojedinačno, višestruki odabir može da proizvede ukupan zbir koji premašuje 100%.

Polovina ispitanika (50%) nije navela nikakve poteškoće. Međutim, preostali učesnici u istraživanju su se susreli sa različitim izazovima (35% je navelo više od jednog problema), pri čemu su najizraženiji bili strah od povređivanja osećanja kolega (30%) i teškoće u jasnom formulisanju komentara u rubrikama za vršnjačko ocenjivanje (25%). Manji postotak studenata smatrao je da njihova povratna informacija neće biti uvažena (15%), dok su neki izrazili zabrinutost zbog moguće pristrasnosti (15%), nedostatka vremena (13.33%), nedovoljne kompetentnosti (11.67%) i nezainteresovanosti (10%). Jedan student je dodao da mu je bilo teško da proceni da li su pojedini kriterijumi bili ispunjeni ili neispunjeni tokom prezentacije. Navedeni izazovi zabeleženi su i u prethodnim istraživanjima (Ardill, 2024; De Grez et al., 2012; Stančić, 2020; Zhan, 2024), a pojedini od njih javiće se i među odgovorima na otvoreno pitanje u vezi sa ograničenjima i nedostacima vršnjačke povratne informacije.

Uopšteno govoreći, dobijeni rezultati ukazuju na značaj istovremenog razmatranja kognitivnih, afektivnih i socijalnih aspekata pre i tokom primene vršnjačke povratne informacije. Iako su studenti prethodno tvrdili da su dobro pripremljeni za učešće u ovom procesu, rezultati jasno upućuju na potrebu za intenzivnijom nastavničkom podrškom i uvežbavanjem kroz analizu primera dobre prakse i stvarnu upotrebu rubrika. Nalazi takođe naglašavaju važnost stvaranja okruženja u kom su studenti spremniji da prihvate kritiku i prepoznaju vrednost povratne informacije, što može da poveća njihovo angažovanje.

U narednom pitanju nastojao se steći uvid u stavove studenata u vezi sa dobijenom povratnom informacijom, njenom primenom i uticajem na izlaganje. Izlagači su zamoljeni da izraze stepen slaganja, odnosno neslaganja sa tvrdnjama u sklopu petostepene Likertove skale (Tabela 2).

Najveći postotak studenata iskazao je spremnost da unapredi veštine izlaganja (90.69%), dok je 76.24% ispitanika navelo da je, zahvaljujući aktivnosti vršnjačke povratne informacije, poboljšalo kvalitet svog usmenog izlaganja. Većina studenata smatrala je dobijenu povratnu informaciju korisnom (88.36%), tačnom (79.07%), i nije je zanemarilo (69.76%). Dati rezultati su međusobno usklađeni i ukazuju na visok nivo motivacije i angažovanosti studenata. Oni potvrđuju zapažanje Prajs i saradnici (Price et al., 2010, str. 279) da „povratna informacija može biti delotvorna samo ako je student razume i ako je spreman i sposoban da postupi u skladu sa njom."

Tabela 2
Percepcije izlagača u vezi sa dobijenom povratnom informacijom, njenom primenom i uticajem

Tvrdnja	Uopšte se ne slažem	Ne slažem se	Niti se slažem, niti se ne slažem	Slažem se	Slažem se u potpunosti	*Medijana*	*SD*
1. Smatram da su povratne informacije kolega bile tačne.	2.33%	.00%	18.60%	51.16%	27.91%	4	.835
2. Smatram da su povratne informacije kolega bile korisne.	2.33%	2.33%	6.98%	44.18%	44.18%	4	.886
3. Zanemario/la sam povratne informacije dobijene od kolega.	25.58%	44.18%	25.58%	2.33%	2.33%	2	.905
4. Bio/la sam spreman/ na da unapredim svoje izlaganje.	2.33%	.00%	6.98%	20.93%	69.76%	5	.849
5. Unapredio/la sam svoje izlaganje. zahvaljujući vršnjačkoj povratnoj informaciji.	4.76%	2.33%	16.67%	28.62%	47.62%	4	1.171

U narednom pitanju otvorenog tipa studenti su zamoljeni da dodatno obrazlože svoje stavove. Nešto više od polovine uzorka (53.33%) dalo je komentare koji su uglavnom potvrđivali njihov pozitivan stav prema aktivnosti (npr. „Ideja da nam kolege daju povratnu informaciju je bila odlična. Pomogli su mi da unapredim veštine izlaganja."; „Povratna informacija koju sam dobila od kolega bila je veoma korisna. Pružila mi je nove uvide u moje izlaganje. Bila sam spremna da unapredim izlaganje."). Pojedini komentari su ukazali na izazove (npr. „Mislim da je povratna informacija bila korisna, ali kolege nisu bile dovoljno motivisane da daju detaljnije komentare."; „Nisam zanemario komentare svojih kolega jer sam ih smatrao korisnim, iako ne u potpunosti tačnim."). Odgovori pokazuju da su studenti kritički pristupali dobijenoj povratnoj informaciji i upućuju na potrebu da se dodatna pažnja posveti pitanjima tačnosti i angažovanosti. U prilog tome govori i procenat studenata koji su odabrali opciju „niti se slažem niti se ne slažem" za tvrdnje koje se odnose na tačnost vršnjačke povratne informacije (tvrdnja 1) i njeno prihvatanje i primenu (tvrdnja 3).

Na osnovu navedenog se može zaključiti da je aktivnost dovela do ostvarenja primarnog cilja, a to je unapređenje veštine usmenog izlaganja i kvaliteta prezentacija studenata. To je uočeno i tokom nastavničkog ocenjivanja. Iako pojedini autori ističu da studenti

mogu biti skeptični prema sposobnosti vršnjaka da pruže kvalitetnu povratnu informaciju, rezultati ovog istraživanja potvrđuju nalaze Ardila (Ardill, 2025), Gudina i saradnika (Gudiño et al., 2024), Murilja-Zamorana i Montanera (Murillo-Zamorano & Montanero, 2018), kao i Prosenjaka i Lučev (Prosenjak & Lučev, 2020), prema kojima pažljivo osmišljena i strukturirana aktivnost, mogućnost ponovnog izlaganja nakon korigovanja, upotreba rubrika i podrška nastavnika mogu značajno doprineti njenoj uspešnoj realizaciji.

U narednom pitanju otvorenog tipa ispitivani su stavovi studenata o benefitima vršnjačke povratne informacije. Analiza odgovora 55 studenata prikazana je u Tabeli 3.

Tabela 3
Percepcije studenata o benefitima vršnjačke povratne informacije

Tema	Ilustracija	Broj navođenja
Unapređenje komunikativnih veština i veštine izlaganja	„Unapredio sam govor tela [...], vizuelne elemente i kvalitet prezentacije (tekst, struktura, navođenje ključnih ideja, kontrast boja ...).“ „[Vršnjačka povratna informacija] razvija komunikativne i govorničke veštine.“	29
Svest o prednostima i nedostacima	„[Vršnjačka povratna informacija nam pomaže da] bolje razumemo probleme s kojima se susrećemo tokom izlaganja.“	13
Smernice za unapređenje	„[Vršnjačka povratna informacija] mi je pružila konstruktivnu kritiku i pomogla da prepoznam oblasti koje treba da unapredim.“	8
Uvid u različite perspektive	„[Vršnjačka povratna informacija] mi je pomogla da sagledam prezentaciju iz različitih perspektiva i steknem nove uvide.“	7
Povećanje samopouzdanja	„[Ova aktivnost] mi je povećala samopouzdanje.“	6
Učenje kroz ponavljanje	„Ogromna korist ovog projekta je bila mogućnost da prezentujemo dva puta.“	5
Smanjena anksioznost	„Imali smo probni krug izlaganja [...], i to je mi je zaista pomoglo da prevaziđem tremu.“	4
Unapređenje veština u domenu povratne informacije	„Rad na konstruktivnoj kritici i učenje kako da se ona prihvati bez negativnih emocija [mi je bilo korisno].“	2
Saradnja	„[Vršnjačka povratna informacija] je unapredila saradnju i doprinela kreiranju podsticajnog okruženja za učenje.“	1

Benefiti koje su studenti naveli su u skladu sa rezultatima prethodnih istraživanja (Ardill, 2025; Nicol et al., 2013; Prodanović Stankić, 2017; van Ginkel et al., 2017; Winstone & Carless, 2020) i pokazuju da vršnjačka povratna informacija može uticati kako na kvalitet samog izlaganja tako i na kognitivne, afektivne i socijalne aspekte učenja, što potvrđuje njenu višedimenzionalnu i transverzalnu prirodu. Odgovori ispitanika ukazuju na njihovu angažovanost i razumevanje kriterijuma evaluacije, spremnost da prihvate različite perspektive i da kritički sagledaju sopstvene slabosti. Takođe, naglašen je značaj strukturiranja procesa vršnjačke povratne informacije kroz upotrebu rubrika i kontinuirano uvežbavanje.

U narednom pitanju otvorenog tipa ispitivane su percepcije studenata o ograničenjima i nedostacima vršnjačke povratne informacije. Od 52 studenta koji su odgovorili na ovo pitanje, njih 22 nije navelo nikakve probleme, dok su ostali ukazali na ograničenja prikazana u Tabeli 4.

Tabela 4

Percepcije studenata u vezi sa nedostacima i organičenjima vršnjačke povratne informacije

Tema	Ilustracija	Broj navođenja
Nedostatak iskrenosti, tačnosti i specifičnosti	„Pojedine kolege nisu davale iskrene povratne informacije." „Neki komentari nisu bili dovoljno specifični." „Pojedine povratne informacije su bile u suprotnosti sa drugim komentarima."	12
Kompetencije davalaca povratne informacije	„Neki studenti ne umeju jasno da izraze svoje ideje." „[Ponekad] ne razumemo dovoljno temu da bismo mogli da damo povratnu informaciju, pa ne znam koliko je ona bila korisna."	7
Nizak stepen angažovanosti	„Mislim da [studenti] nisu posvećivali dovoljno pažnje izlaganjima." „Smatram da studenti često nisu zainteresovani za aktivnosti koje ne utiču na poene i ocenu."	6
Vremenska organičenja	„Nije bilo dovoljno vremena da iskažem mišljenje. Možda su pitanja bila previše detaljna."	4
Strah od narušavanja odnosa	„Po mom mišljenju, mnoge moje kolege su se plašile da ne povrede osećanja izlagača." „Studenti mogu oklevati da upute kritičke komentare jer bi to moglo da naruši odnose sa kolegama."	4
Trajanje aktivnosti	„Ova aktivnost je oduzimala dosta vremena."	3

Kada je reč o nedostacima i ograničenjima vršnjačke povratne informacije, odgovori studenata su u skladu sa nalazima dobijenim u okviru pitanja višestrukog izbora koje se odnosilo na prepreke, te na taj način potvrđuju određene manjkavosti u implementaciji aktivnosti i potrebu za daljim razvojem veština studenata u domenu povratne informacije. Većina ispitanika je kao ključne izazove identifikovala teme koje su zapravo međusobno povezane: kvalitet povratne informacije i kompetentnost njenih davalaca. Naglasili su potrebu za sistematičnom obukom za davanje povratne informacije. Poslednji komentar, koji se odnosi na kompetentnost davalaca povratne informacije, ističe to da se ova veština razvija postepeno, kroz vežbanje. Ipak, loš kvalitet povratne informacije može biti povezan i sa drugim uočenim temama, kao što su nedovoljna angažovanost studenata, vremenska ograničenja i strah od narušavanja odnosa sa vršnjacima, što zapažaju i Kajser i saradnici (Qaiser et al., 2022). Stoga bi obuka trebalo da obuhvati i afektivnu dimenziju, odnosno da studente osposobi za konstruktivno davanje i prihvatanje kritike.

Valja napomenuti da se i afektivni aspekt i kvalitet povratne informacije mogu dovesti u vezu sa kolektivističkom kulturom (Čorbić, 2024). Čorbić (Čorbić, 2024) je utvrdila da su komunikativne strategije i jezički izbori studenata prilikom davanja vršnjačke povratne informacije određeni njihovom željom da ispolje solidarnost, učtivost i prijateljski odnos prema kolegama. Slično objašnjenje može se primeniti i na rezultate ovog istraživanja. Naime, studenti su skloni da ublažavaju uočene nedostatke i pružaju nedovoljno konkretnu ili preterano pozitivnu povratnu informaciju kako bi očuvali dobre međusobne odnose i ojačali osećaj pripadnosti grupi.

Nadalje, nalazi ukazuju na značaj motivacije i potrebu za uvođenjem mehanizama koji bi podstakli veće angažovanje studenata (npr. dodeljivanje poena i davaocima povratne informacije, a ne samo izlagačima). Ardil (Ardill, 2025) zastupa stav da nastavnici treba kontinuirano da naglašavaju vrednost povratne informacije kao veštine značajne za profesionalni i lični razvoj.

Poslednje dve stavke u okviru Likertove petostepene skale ispitivale su stavove studenata o uključivanju vršnjačke povratne informacije u redovnu nastavnu praksu i njihovo ukupno zadovoljstvo sprovedenom aktivnošću. Kada je reč o prvom pitanju, većina ispitanika podržala je integraciju vršnjačke povratne informacije u nastavu (36.67% se složilo, a 26.67% se u potpunosti složilo), dok je 33.33% odabralo odgovor „niti se slažem, niti se ne slažem", a 3.33% je iskazalo neslaganje. Medijana je iznosila 4, a standardna devijacija 0.889. Što se tiče zadovoljstva aktivnošću, gotovo polovina uzorka (48.33%) odabrala je najvišu vrednost (vrednost 5), 35% vrednost 4, dok je preostalih 16.67% odabralo vrednost 3. Nijedan ispitanik nije odabrao najniže vrednosti (1 i 2). Medijana za ovu stavku je iznosila 4, a standardna devijacija .748.

Ovi rezultati su ohrabrujući i sugerišu da, uz određena unapređenja u načinu sprovođenja, koja su istaknuta u prethodnim pitanjima, vršnjačka povratna informacija predstavlja delotvoran i podsticajan pristup razvoju veštine usmenog izlaganja. Poređenje stavova studenata u zavisnosti od njihove uloge u aktivnosti pokazalo je statistički značajne razlike kod oba pitanja. Kod prvog pitanja utvrđena je srednja veličina efekta (z = -3.139,

$p = .002$, $r = .41$), dok je kod drugog veličina efekta bila između srednje i velike ($z = -3.598$, $p < .001$, $r = .46$). Studenti koji su preuzeli obe uloge pokazali su veći stepen prihvatanja i zadovoljstva aktivnošću u odnosu na one koji su učestvovali samo kao davaoci povratne informacije. Ovaj nalaz ukazuje na to da iskustvo sa obema ulogama u okviru vršnjačke povratne informacije doprinosi boljem razumevanju njene vrednosti, naročito zato što su ti studenti mogli neposredno da uoče i njen uticaj na sopstveno usmeno izlaganje.

Zaključak

U ovom istraživanju su ispitivani stavovi i iskustva studenata na predmetu Engleski jezik za ekonomiste u vezi sa benefitima i izazovima vršnjačke povratne informacije, kao i shvatanja njene uloge u razvoju veštine usmenog izlaganja. Analiza perspektiva kako davalaca tako i primalaca vršnjačke povratne informacije omogućava dublje razumevanje mehanizama i potencijala ovog procesa. Dobijeni nalazi pružaju značajne pedagoške implikacije koje prevazilaze okvire nastave engleskog jezika struke.

Uopšteno govoreći, vršnjačka povratna informacija kao sredstvo razvoja veštine usmenog izlaganja pokazala se višestruko korisnom. Studenti su naveli da je doprinela unapređenju kvaliteta njihovih izlaganja i transverzalnih veština. Kada je reč o samom izlaganju, aktivnost im je pomogla da bolje razumeju kriterijume uspešne prezentacije, prepoznaju aspekte koji zahtevaju unapređenje i steknu samopouzdanje. Navedeno je uočeno i od strane nastavnika tokom ocenjivanja korigovanih prezentacija. U pogledu transverzalnih veština, studenti su istakli da su aktivnim korišćenjem rubrika za davanje povratne informacije, razmatranjem različitih perspektiva i saradnjom sa vršnjacima unapredili kognitivne sposobnosti, kritičko mišljenje i samoregulisano učenje. Pedagoška implikacija ovih nalaza ogleda se u činjenici da uspešnost primene vršnjačke povratne informacije u velikoj meri zavisi od načina na koji je osmišljena. Obuka koja uključuje primere dobre prakse i upotrebu rubrika, kao i ciklična priroda procesa (mogućnost ponovnog izlaganja nakon korigovanja i ponavljanje postupka davanja povratne informacije) pospešuju ostvarivanje ishoda učenja. Pri tome je od presudnog značaja spremnost studenata da se aktivno uključe u ovaj proces.

Međutim, izazovi koje su studenti naveli upućuju na određene nedostatke u realizaciji aktivnosti. Najčešći izazov odnosio se na kvalitet povratne informacije, pre svega njenu tačnost, konkretnost i objektivnost; kompetentnost davaoca povratne informacije; afektivne faktore, poput pristrasnosti i straha od narušavanja odnosa sa kolegama; angažovanost studenata, naročito davaoca povratne informacije; kao i vremenska ograničenja. Konzistentno javljanje ovih tema u nalazima istraživanja naglašava potrebu za preduzimanjem konkretnih mera kako bi se ublažio njihov negativan uticaj na ishode učenja i zadovoljstvo studenata. Ovi aspekti su međusobno povezani, što svedoči o složenosti procesa i potrebi da se kognitivna, afektivna i socijalna dimenzija posmatraju kao celina tokom faze planiranja i sprovođenja vršnjačke povratne informacije. Sa pedagoškog stanovišta, rezultati ukazuju na potrebu da se veća pažnja posveti razvoju

sposobnosti studenata da pruže kvalitetnu povratnu informaciju kroz modelovanje, kontinuirano uvežbavanje i potporu nastavnika. Posebno je važno da studenti nauče kako da na konstruktivan način formulišu i pozitivne i kritičke komentare. Pažljivo oblikovanje povratne informacije i stvaranje podsticajnog okruženja mogu doprineti smanjenju emocionalnih barijera. Kada je reč o angažovanosti studenata, rezultati pokazuju da preuzimanje dvostruke uloge doprinosi dubljem razumevanju vrednosti povratne informacije. Pored toga, određeni oblici podsticaja mogli bi pozitivno uticati na učešće studenata. Ipak, studenti treba da prepoznaju stvarnu vrednost vršnjačke povratne informacije, što zahteva od nastavnika da kontinuirano ističu njen značaj za „celoživotni profesionalni razvoj tokom visokog obrazovanja i budućeg profesionalnog angažovanja" (Ardill, 2025, str. 20).

Na kraju, potrebno je ukazati na određena ograničenja ovog istraživanja. Uzorak je obuhvatio samo jednu visokoškolsku ustanovu i specifičan profil studenata (studente ekonomije). Sprovođenje istraživanja na većem i raznovrsnijem uzorku, koji bi obuhvatio više institucija, povećalo bi mogućnost generalizacije rezultata i potencijalno ukazalo na disciplinarne razlike u pristupu ovoj praksi. Nadalje, oslanjanje isključivo na upitnik zasnovan na samoproceni povećava rizik od pristrasnosti u odgovorima. Uključivanje dodatnih izvora podataka, kao što su video-snimci prezentacija i/ili nastavnička evaluacija, moglo bi povećati objektivnost i pouzdanost zaključaka. Uprkos navedenim ograničenjima, istraživanje je značajno jer pruža važne uvide u pristup čije su brojne obrazovne prednosti potvrđene. Buduća istraživanja mogla bi biti usmerena na perspektivu nastavnika, naročito na njihova uverenja i prakse u vezi sa vršnjačkom povratnom informacijom. To bi omogućilo sveobuhvatnije razumevanje postojećeg obrazovnog konteksta i pružilo osnovu za sistematičniju integraciju ove aktivnosti u nastavu.

Literatura

Adachi, C., Tai, J. H. M., & Dawson, P. (2017). Academics' perceptions of the benefits and challenges of self and peer assessment in higher education. *Assessment & Evaluation in Higher Education*, *43*(2), 294-306. https://doi.org/10.1080/02602938.2017.1339775

Alqassab, M., Strijbos, J. W., & Ufer, S. (2018). Training peer-feedback skills on geometric construction tasks: Role of domain knowledge and peer-feedback levels. *European Journal of Psychology of Education*, *33*(1), 11-30. https://doi.org/10.1007/s10212-017-0342-0

Anđelković, J. (2022). Peer and teacher assessment of academic essay writing: Procedure and correspondence. *Journal of Teaching English for Specific and Academic Purposes, 10*(1), 171-184. https://doi.org/10.22190/JTESAP2201171A

Ardill, N. (2025). Peer feedback in higher education: student perceptions of peer review and strategies for learning enhancement. *European Journal of Higher Education*, *15*(4), 696-721. https://doi.org/10.1080/21568235.2025.2457466

Carless, D., & Boud, D. (2018). The development of student feedback literacy: enabling uptake of feedback. *Assessment & Evaluation in Higher Education*, *43*(8), 1315-1325. https://doi.org/10.1080/02602938.2018.1463354

Cho, K., & MacArthur, C. (2011). Learning by reviewing. *Journal of Educational Psychology*, *103*(1), 73-84. https://doi.org/10.1037/a0021950

Čorbić, I. (2024). Speech act of criticism in peer feedback on argumentative essays of university students of English in computer-mediated communication (CMC). *Belgrade English Language and Literature Studies, 16*(1), 85-110. https://doi.org/10.18485/bells.2024.16.4

Day, N. Z. I., Saab, N., & Admiraal, W. (2021). Online peer feedback on video presentations: type of feedback and improvement of presentation skills. *Assessment & Evaluation in Higher Education*, *47*(2), 183-197. https://doi.org/10.1080/02602938.2021.1904826

De Grez, L. (2009). *Optimizing the instructional environment to learn presentation skills* (PhD Thesis). Academic bibliography. https://biblio.ugent.be/publication/7051516

De Grez, L., Valcke, M., & Roozen, I. (2012). How effective are self- and peer assessment of oral presentation skills compared with teachers' assessments? *Active Learning in Higher Education*, *13*(2), 129-142. https://doi.org/10.1177/1469787412441284

Dickson, H., Harvey, J., & Blackwood, N. (2019). Feedback, feedforward: evaluating the effectiveness of an oral peer review exercise amongst postgraduate students. *Assessment & Evaluation in Higher Education*, *44*(5), 692-704. https://doi.org/10.1080/02602938.2018.1528341

Dong, Z., Gao, Y., & Schunn, C. D. (2023). Assessing students' peer feedback literacy in writing: scale development and validation. *Assessment & Evaluation in Higher Education*, *48*(8), 1103-1118. https://doi.org/10.1080/02602938.2023.2175781

Gudiño, D., Fernández-Sánchez, M. J., Becerra-Traver, M.-T., & Sánchez-Herrera, S. (2024). University students' perceptions of peer assessment in oral presentations. *Education Sciences*, *14*(3), 221 -236. https://doi.org/10.3390/educsci14030221

Huisman, B., Saab, N., van Driel, J., & van den Broek, P. (2018). Peer feedback on academic writing: undergraduate students' peer feedback role, peer feedback perceptions and essay performance. *Assessment & Evaluation in Higher Education*, *43*(6), 955-968. https://doi.org/10.1080/02602938.2018.1424318

Jerotijević Tišma, D. (2016). Serbian EFL teachers and learners' attitudes to peer assessment and the comparison of teacher and peer speaking assessment scores. *Nastava i vaspitanje*, *65*(2), 379-393. https://doi.org/10.5937/nasvas1602379j

Kim, M. (2009). The impact of an elaborated assessee's role in peer assessment. *Assessment & Evaluation in Higher Education*, *34*(1), 105-114. https://doi.org/10.1080/02602930801955960

King, P. E., Young, M. J., & Behnke, R. R. (2000). Public speaking performance improvement as a function of information processing in immediate and delayed feedback interventions. *Communication Education*, *49*(4), 365-374. https://doi.org/10.1080/03634520009379224

Lundstrom, K., & Baker, W. (2009). To give is better than to receive: The benefits of peer review to the reviewer's own writing. *Journal of Second Language Writing*, *18*(1), 30-43. https://doi.org/10.1016/j.jslw.2008.06.002

Murillo-Zamorano, L. R., & Montanero, M. (2018). Oral presentations in higher education: a comparison of the impact of peer and teacher feedback. *Assessment & Evaluation in Higher Education*, *43*(1), 138-150. https://doi.org/10.1080/02602938.2017.1303032

Nicol, D., Thomson, A., & Breslin, C. (2013). Rethinking feedback practices in higher education: A peer review perspective. *Assessment & Evaluation in Higher Education, 39*(1), 102-122. https://doi.org/10.1080/02602938.2013.795518

Palmour, L. (2026). What teachers and students value in presentation style: towards inclusive oracy practices in Higher Education assessment. *Journal of Further and Higher Education, 50*(1), 166-183. https://doi.org/10.1080/0309877X.2025.2587826

Price, M., Handley, K., Millar, J., & O'Donovan, B. (2010). Feedback : all that effort, but what is the effect? *Assessment & Evaluation in Higher Education*, *35*(3), 277-289. https://doi.org/10.1080/02602930903541007

Prodanović Stankić, D. (2017). Peer feedback as a collaborative task used in improving writing skills: A case study. *Nastava i vaspitanje 66*(3), 515-526. https://doi.org/10.5937/nasvas1703515P

Prosenjak, B., & Lučev, I. (2020). The impact of peer assessment on the attainment level of oral presentations skills. *Language Value*, *12*(1), 30-55. https://doi.org/10.6035/LanguageV.2020.12.3

Qaiser R., Fadden P., Rustom S., & Shaw J. (2022). Real-time peer-to-peer observation and feedback lead to improvement in oral presentation skills. *Cureus*, *14*(2), e21992. https://doi.org/10.7759/cureus.21992

Stančić, M. (2020). Peer assessment as a learning and self-assessment tool: a look inside the black box. *Assessment & Evaluation in Higher Education*, *46*(6), 852-864. https://doi.org/10.1080/02602938.2020.1828267

Stančić, M., Milin, V., & Gašić, A. (2024). Peer feedback in higher education: How students' roles affect providing and receiving feedback. *Studies in Educational Evaluation*, *83*, 101408, 1-9. https://doi.org/10.1016/j.stueduc.2024.101408

Strijbos, J.-W., Pat-El, R. J., & Narciss, S. (2010). Validation of a (peer) feedback perceptions questionnaire. In L. Dirckinck-Holmfeld, V. Hodgson, C. Jones, M. de Laat, D. McConnell, & T. Ryberg (Eds.), *Proceedings of the International Conference on Networked Learning*, *7,* 378-386. Aalborg University Open Publishing. https://doi.org/10.54337/nlc.v7.9203

Topping, K. J. (2017). Peer assessment: Learning by judging and discussing the work of other learners. *Interdisciplinary Education and Psychology, 1*(1), 1-17. https://doi.org/10.31532/InterdiscipEducPsychol.1.1.007

Tsivitanidou, O. E., & Constantinou, C. P. (2016). A study of students' heuristics and strategy patterns in web-based reciprocal peer assessment for science learning. *The Internet and Higher Education*, *29*, 12-22. https://doi.org/10.1016/j.iheduc.2015.11.002

Urena-Rodriguez, L., Lowell, V. L., & Yan, W. (2025). Peer Feedback, English Public Speaking Self-Efficacy, and Performance in Facebook and Brightspace. *Education Sciences*, *15*(7), 879. https://doi.org/10.3390/educsci15070879

van Ginkel, S., Gulikers, J., Biemans, H., & Mulder, M. (2015). Towards a set of design principles for developing oral presentation competence: A synthesis of research in higher education. *Educational Research Review, 14*, 62-80. https://doi.org/10.1016/j.edurev.2015.02.002

van Ginkel, S., Gulikers, J., Biemans, H., & Mulder, M. (2017). Fostering oral presentation performance: does the quality of feedback differ when provided by the teacher, peers or peers guided by tutor?

Assessment & Evaluation in Higher Education, *42*(6), 953-966. https://doi.org/10.1080/02602938.2016.1212984

Winstone, N., & Carless, D. (2020). *Designing Effective Feedback Processes in Higher Education*. Routledge. https://doi.org/10.4324/9781351115940

Zamorano, D., Panadero, E., Alqassab, M., & Amillano, A. (2025). Effect of peer feedback role: Task performance, feedback implementation and perceptions on learning and trust. *The Journal of Experimental Education*, *94*(4), 797-821. https://doi.org/10.1080/00220973.2025.2466146

Zamorano, D., Panadero, E., Alqassab, M., & Gómez-Varela, J. F. (2026). Provider versus recipient: Peer feedback roles effect on task performance, perceptions of learning, trust, and epistemic emotions. *Studies in Educational Evaluation*, *88*, 101560. https://doi.org/10.1016/j.stueduc.2026.101560

Zareva, A. (2009). Informational packaging, level of formality, and the use of circumstance adverbials in L1 and L2 student academic presentations. *Journal of English for Academic Purposes*, *8*(1), 55-68. https://doi.org/10.1016/j.jeap.2008.12.002

Zhan, Y. (2024). Are they ready? An investigation of university students' difficulties in peer assessment from dual perspectives. *Teaching in Higher Education*, *29*(4), 823-840. https://doi.org/10.1080/13562517.2021.2021393

Zhou, J., Zheng, Y., & Tai, J. H. M. (2020). Grudges and gratitude: the social-affective impacts of peer assessment. *Assessment & Evaluation in Higher Education*, *45*(3), 345-358. https://doi.org/10.1080/02602938.2019.1643449

Primljeno: 13.02.2026.
Korigovana verzija primljena: 30.04.2026.
Prihvaćeno za štampu: 04.06.2026.

Mirna Vidaković
Ekonomski fakultet u Subotici, Univerzitet u Novom Sadu, Subotica, Srbija
https://orcid.org/0000-0001-8986-7505

Ovaj rad je objavljen pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). Dopušteno je da se delo kopira i distribuira u svim medijima i formatima, da se prera đuje, menja i nadograđuje u bilo koje svrhe, uključujući i komercijalne, pod uslovom da se na pravilan način citiraju njegovi prvobitni autori, postavi link ka originalnoj licenci i naznači da li je delo izmenjeno. Korisnici su pri tome dužni da navedu pun bibliografski opis članka objavljenog u ovom časopisu (autori, naslov rada, naslov časopisa, volumen, sveska, paginacija), kao i njegovu DOI oznaku, a u slučaju objavljivanja u elektronskoj formi takođe su dužni da postave i HTML link.

Uputstvo za autore

Nastava i vaspitanje je časopis u kojem se objavljuju originalni naučni i pregledni radovi pedagoške tematike.

Dostavljanje radova

Radovi se dostavljaju isključivo posredstvom SCIndeks Asistent sistema za uređivanje časopisa koji možete pronaći na linku:

https://aseestant.ceon.rs/index.php/nasvas/index

Tekstove je potrebno pripremiti u skladu sa tehničkim uputstvima datim u Uputstvu za autore. Obaveza autora je da na adresu Uredništva šalju isključivo originalne radove koji nisu objavljeni ili istovremeno ponuđeni nekom drugom časopisu. U skladu sa tim autori su dužni da uz rad dostave i popunjenu i potpisanu Izjavu o autorstvu (dokument se nalazi na sajtu časopisa).

Uz rad, potrebno je dostaviti sledeće informacije o autoru (autorima): ime i prezime, godina rođenja, (naučno) zvanje, radno mesto, službenu e-mail adresu.

Etičke norme

Dostavljeni radovi moraju biti napisani u skladu sa etičkim standardima koji važe za naučnoistraživačke radove, uz poštovanje principa dobrobiti i dostojanstva učesnika u istraživanju, kao i zaštite njihove privatnosti (za dodatne informacije, konsultovati poslednju verziju *APA Publication Manual*).

Upotreba alata veštačke inteligencije

U pripremi teksta radova za objavljivanje u časopisu Nastava i vaspitanje, alati veštačke inteligencije se mogu koristiti isključivo kao tehnička ispomoć, ali ne za kreiranje generisanog sadržaja. Alatka veštačke inteligencije ni u kom slučaju ne može biti autor ili koautor rukopisa, niti autor citiranog rada (reference).

Neprijavljivanje upotrebe alata veštačke inteligencije u rukopisima smatra se povredom etičkih načela i, ako se utvrdi, može dovesti do odbacivanja rukopisa i mera predviđanih smernicama etičkih regulatornih organizacija, npr. COPE. Autori snose punu odgovornost za originalnost, tačnost i integritet rada.

Ocenjivanje radova

Nakon prijema radova urednici obavljaju pregled radova i donose odluku o tome koji radovi ulaze u proces recenziranja. Ukoliko se rad tematski ne uklapa u koncepciju časopisa, ne uvažava etičke norme ili nije usklađen sa Uputstvom za autore, autori se obaveštavaju o tome da rad ne može biti prihvaćen.

Radove koji uđu u proces recenziranja, procenjuju dva kompetentna recenzenta. Recenzenti ne znaju identitet autora, niti autori dobijaju podatke o identitetu recenzenata.

Nakon recenziranja, Uredništvo donosi odluku o objavljivanju, korekciji ili odbijanju rada. Autori dobijaju recenzije i informaciju o odluci Uredništva.

Prilikom dostavljanja korigovane verzije rada, autori su dužni da u pisanoj formi Uredništvo upoznaju sa svim izvršenim izmenama (broj stranice na kojoj se nalazi izmena i označavanje mesta na kome je promena izvršena), kao i da u tekstu jasno označe izvršene izmene u skladu sa preporukama recenzenata.

Radovi se nakon prihvatanja za objavljivanje upućuju na softversku proveru na plagijarizam. Ukoliko rezultati provere pokažu da rad sadrži plagirani tekst, rad neće biti objavljen i pored pozitivnih recenzija.

Objavljivanje radova

Autori će na uvid dobiti tekst koji je pripremljen za štampu kako bi se obezbedila konačna verifikacija pre objavljivanja. Ovaj korak ne dozvoljava dodavanje novog teksta ili značajnije promene u radu.

Troškovi objavljivanja radova

Objavljivanje rada u časopisu Nastava i vaspitanje se ne naplaćuje. Izdavač časopisa snosi troškove lekture, tehničke pripreme i štampanja radova.

Korišćenje licence

Časopis Nastava i vaspitanje je časopis u otvorenom pristupu i od 2025. godine radove objavljuje pod licencom Creative Commons Attribution 4.0 International (CC BY 4.0). U periodu od 2016. do 2024. godine radovi su bili publikovani pod licencom CC-BY SA.

Tehnička upustva za pisanje rada

Jezik rada

Rad se dostavlja u tekst procesoru Microsoft Word, stranica A4 formata, font Times New Roman, veličina slova 12, prored 1,5.

U skladu sa Pravilnikom za kategorizaciju i rangiranje časopisa, časopis Nastava i vaspitanje objavljuje sve radove dvojezično – na srpskom (ćirilično pismo – Serbian, cyrillic) i engleskom jeziku.

Dužina rada

Obim rada obuhvata jedan autorski tabak, odnosno do 30.000 znakova s praznim mestima. Izuzetno, pregledni radovi i radovi koji predstavljaju teorijske analize mogu da budu dužine do 50.000 znakova. U obim nisu uračunati apstrakt i spisak korišćene literature na kraju rada. Urednici zadržavaju pravo da donose odluku o objavljivanju radova dužeg obima od predviđenog ukoliko tematika rada i/ili predmet istraživanja to zahtevaju i ukoliko se radi o naučnim tekstovima visokog nivoa kvaliteta.

Elementi i struktura rada

Naslov rada. Naslovna strana sadrži sledeće informacije: naslov rada, ime, srednje slovo i prezime autora (i koautora), kompletan naziv institucije (na primer: odeljenje/departman/katedra, fakultet, univerzitet), mesto i država (ukoliko je autor iz inostranstva), službenu e-mail adresu prvog autora.

Ukoliko su radovi rezultat rada na naučno-istraživačkim projektima, u fusnoti uz naslov rada na naslovnoj strani rada navode se osnovni podaci o projektu.

Apstrakt. Apstrakt treba da ima od 150 do 250 reči. Ukoliko je reč o radu koji predstavlja prikaz obavljenog istraživanja, apstrakt treba da sadrži sledeće elemente: značaj problema istraživanja, ciljeve istraživanja, metodologiju istraživanja, ključne rezultate istraživanja, zaključke i pedagoške implikacije. U slučaju preglednog rada ili rada koji predstavlja teorijsku analizu, apstrakt treba da sadrži: problem koji se u radu razmatra, prikaz strukture rada, ključne postavke koje se daju u radu i zaključke. Apstrakt treba da bude napisan u jednom pasusu, bez pozivanja na reference, veličina slova 11, obostrano poravnan.

Ključne reči. Uz apstrakt se navode ključne reči (do pet) na jeziku rada. Ključne reči treba da budu relevantne za problematiku kojom se rad bavi i pogodne za pretraživanje. Preporučujemo korišćenje tezaurusa, kao što je npr. ERIC: https://eric.ed.gov/?ti=all

Struktura rada. Rad je potrebno strukturirati na logički uređen način. Rad koji predstavlja prikaz obavljenih istraživanja treba da sadrži sledeće celine: uvod, predstavljanje teorijskih osnova istraživanja, opis metodologije istraživanja, prikaz rezultata istraživanja sa diskusijom (uz navođenje pedagoških implikacija obavljenog istraživanja) i zaključke. Pregledni rad ili rad koji predstavlja teorijsku analizu, pored uvoda i zaključaka treba da bude logički strukturiran u skladu sa osnovnom temom rada.

Naslovi i podnaslovi odeljaka. Naslovi i podnaslovi odeljaka ne označavaju se numerički, potrebno ih je jasno i precizno formulisati i formatirati prema uputstvu prikazanom u Tabeli 1.

Tabela 1

Način formatiranja naslova i podnaslova odeljaka prema nivoima

Nivo	Način formatiranja
1	**Centrirano, bold, font 12**
2	**Levo poravnanje, bold, font 12**
3	***Levo poravnanje, bold i kurziv, font 12***
4	**Uvučeno, bold, font 12, tačka na kraju. (tekst u nastavku)**
5	***Uvučeno, bold i kurziv, font 12, tačka na kraju.*** **(tekst u nastavku)**

Napomena. Primeri formata dati su samo za naslove i podnaslove odeljaka i ne odnose se na naslov rada.

Tabele i grafikoni. Svaka tabela, odnosno grafikon označava se odgovarajućim brojem. Jasno i precizno formulisan naslov tabele ili grafikona daje se u novom redu, u kurzivu. Naslov tabela ili grafikona treba da bude pozicioniran iznad tabele ili grafikona (videti Tabelu 1 ovog uputstva). Sve skraćenice navedene u tabelama i grafikonima treba da budu objašnjene. U objašnjenju (legendi), ispod tabele ili grafikona reč napomena piše se kurzivom sa tačkom na kraju reči (*Napomena*. ili *Note*. u zavisnosti od jezika rada, videti primer u Tabeli 1). Tabele ne treba da sadrže vertikalne linije. Horizontalne linije treba koristiti samo između zaglavlja tabele i prikazanih podataka (kao na primeru u Tabeli 1) i na dnu tabele. Izuzetno, horizontalne linije dozvoljene su i u okviru samog zaglavlja ukoliko to doprinosi preglednosti tabele.

Tabele i grafikone priložiti u Microsoft Word formatu, kreirati i dostaviti u programu koji omogućava njihovo dodatno uređivanje. Informacije na grafikonima se ne ističu bojama, već šrafiranjem. Digitalne fotografije ili slike dostavljaju se u rezoluciji najmanje 300 dpi, grayscale color mode.

Oznake statističkih testova i mera. Sve oznake statističkih testova i mera pisati kurzivom u celom tekstu rada, uključujući i tabele (*M, SD, F, t, p*).

Fusnote i skraćenice. Fusnote i skraćenice trebalo bi izbegavati.

Reference u radu. Pozive na izvore u tekstu i spisak korišćene literature na kraju rada treba dati u skladu sa APA stilom (*APA Citation Style - American Psychological Association 7th Edition*, https://apastyle.apa.org/instructional-aids/reference-examples.pdf).

U spisku korišćene literature na kraju rada i u zagradama u tekstu sve reference, uključujući one na srpskom jeziku, navode se latinicom. Prezimena stranih autora u radu pisanom na srpskom jeziku se transkribuju – fonetskim pisanjem prezimena. U zagradi se obavezno navode u originalu, na primer: Skot (Scott, 2004).

Pozive na izvore u tekstu dati u zagradama uz navođenje: prezimena autora, godine izdanja korišćenog izvora i broja stranice ukoliko se radi o citatu. Navođenje više autora u zagradi urediti abecednim redom prema početnom slovu prezimena autora, a ne hronološki. Ako su u pitanju dva autora, u zagradi se navode oba autora. Ukoliko je više od dva autora navodi se prezime prvog autora skraćenica „i sar." ili „et al." (u zavisnosti od jezika na kom je rad objavljen).

Reference na kraju rada. Spisak korišćene literature obuhvata isključivo izvore na koje se autor poziva u radu. Reference se navode abecednim redom po prezimenima autora. Ako se navodi više radova istog autora, radovi se izlažu hronološkim redom (od najstarijeg ka najnovijem radu). Ukoliko postoji više radova istog autora sa istom godinom objavljivanja, radovi se označavaju slovima a, b, c itd., uz godinu izdanja u zagradi (npr: 2012a, 2012b). Ukoliko ima više autora, referenca se navodi prema prezimenu prvog autora, ali sadrži prezimena i inicijale ostalih autora.

Na spisku korišćene literature na kraju rada ne stavljaju se redni brojevi ispred referenci.

Primeri navođenja referenci na spisku korišćene literature na kraju rada:

Knjiga: Referenca sadrži prezime i inicijale svih autora, godinu izdanja u zagradi, naslov knjige (kurzivom) i naziv izdavača. Ukoliko je knjiga u Web izdanju, neophodno je dodati i internet adresu sa koje je preuzeta.

Apple, M. W. (2012). *Ideologija i kurikulum*. Fabrika knjiga.

Članak u časopisu: Referenca sadrži prezime i inicijale svih autora, godinu izdanja u zagradi, naslov članka, pun naziv časopisa (kurzivom), volumen (kurzivom), broj, stranice i, ukoliko je dostupno, DOI oznaku (u https:// formi).

Colić, V. (2012). Roditelji i vaspitači o pripremi dece za polazak u školu. *Pedagogija*, *67*(2), 252-260.

Emmer, E. T., & Stough, L. M. (2001). Classroom management: A critical part of educational psychology, with implications for teacher education. *Educational Psychology*, *36*(2), 103-112. https://doi.org/10.1207/S15326985EP3602_5

Poglavlje u knjizi (tematskom zborniku): Referenca sadrži prezime i inicijale svih autora, godinu izdanja u zagradi, naziv poglavlja, inicijale i prezime svih urednika, naslov knjige (kurzivom), prvu i poslednju stranicu poglavlja u zagradi i naziv izdavača.

Maksić, S. i Pavlović, J. (2013). Nastava koja podržava kreativnost. U R. Nikolić (ur.), *Nastava i učenje, Kvalitet vaspitno-obrazovnog procesa* (str. 53-64). Učiteljski fakultet u Užicu Univerziteta u Kragujevcu.

Cruse, D. A. (2002). Hyponymy and its varieties. In R. Green, C. A. Bean, & S. H. Myaeng (Eds.), *The semantics of relationships: An interdisciplinary perspective* (pp. 3-22). Kluwer Academic Publishers.

Naučni skupovi i konferencije – radovi štampani u celini: Referenca sadrži prezime i inicijale svih autora, godinu izdanja, naslov priloga, inicijale i prezime svih urednika, naslov izdanja (kurzivom), prvu i poslednju stranicu priloga i naziv institucije – organizatora skupa.

Spasenović, V., Vujisić Zivković, N., & Skubic Ermenc, K. (2012). The role of comparative pedagogy in the training of pedagogues in Serbia and Slovenia. In N. Popov, C. Wolhuter, B. Leutwyler, G. Hilton, J. Ogunleye, & P. Almeida (Eds.), *International perspectives on education, BCES Conference* (pp. 36-42). Bulgarian Comparative Education Society.

Doktorske disertacije i magistarske teze: Referenca sadrži ime autora, godinu, naziv dokumenta (kurzivom), naznaku: doktorska disertacija ili magistarska teza, bazu u kojoj je objavljena, broj disertacije u bazi ukoliko je preuzet iz baze.

Stamatović, J. (2013). *Samovrednovanje nastavnika u funkciji unapređivanja vaspitno-obrazovnog rada* (doktorska disertacija). NaRDUS (123456789/3226)

Web izvor (novinski članak, blog, dokument): Referenca sadrži ime autora, godinu, mesec i datum objavljivanja (ukoliko su navedeni), naziv dokumenta (kurzivom), naziv Web stranice i internet adresu sa koje je preuzet.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). *The difference between emergency remote teaching and online learning*. EDUCASE Review. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Zvanična dokumenta: Referenca sadrži naziv dokumenta (kurzivom), godinu objavljivanja, naziv glasila, broj.

Pravilnik o programu svih oblika rada stručnih saradnika (2012). Prosvetni glasnik, Službeni glasnik Republike Srbije, br. 5/2012.

Prilozi i dodatni materijali. Uz osnovni tekst autori mogu dostaviti Uredništvu i priloge, odnosno dodatni materijal koji je od značaja za potpunije razumevanje sadržaja rada.

Guidelines for Contributors can be found on Studies in Teaching and Education webpage:
https://www.pedagog.rs/studies-in-teaching-and-education/

Studies in Teaching and Education

2 | Belgrade, 2026.

STUDIES IN TEACHING AND EDUCATION VOL. 75 No. 2. pp. 397–528 ISSN 0547-3330 eISSN 2560-3051 UDC37

Publisher:
Pedagogical Society of Serbia
Terazije 26, 11000 Belgrade
Telephone: +381 11 268 77 49
www.pedagog.rs
E-mail: casopis@pedagog.rs

Co-Publisher:
Institute of Pedagogy and Andragogy Faculty of Philosophy, University of Belgrade
Čika Ljubina 18-20, 11000 Belgrade, Serbia
Telephone: +381 11 3282 985

For Publisher:
Ivan Davidović

For Co-Publisher:
Lidija Miškeljin, PhD

Editor-in-chief
Milan Stančić, PhD, associate professor,
Faculty of Philosophy, University of Belgrade, Serbia

Editorial Board
Lidija Vujičić, PhD, full professor,
Faculty of Teacher Education, University of Rijeka, Croatia
Julijana Vučo, PhD, full professor,
Faculty of Philology, University of Belgrade, Serbia of Belgrade, Serbia
Pavel Zgaga, PhD, full professor,
Faculty of Education, University of Ljubljana, Slovenia
Vladeta Milin, PhD, assistant professor,
Faculty of Philosophy, University of Belgrade, Serbia
Saša Milić, PhD, associate professor,
Faculty of Philosophy in Niksić, University of Montenegro, Montenegro
Lidija Miškeljin, PhD, associate professor,
Faculty of Philosophy, University of Belgrade, Serbia
Ilka Parchmann, PhD, full professor,
Leibniz Institute of Science and Mathematics Education, Kiel University, Germany
Jan Peeters, PhD, full professor,
Centre for Innovation in the Early Years,Department of Social Work and Social Pedagogy, Ghent University, Belgium
Rosica Aleksandrova Penkova, PhD, full professor,
Department of Teacher Education, University„Kliment Ohridski", Sofia, Bulgaria
Lidija Radulović, PhD, associate professor,
Faculty of Philosophy, University of Belgrade, Serbia
Mirjana Senić Ružić, PhD, assistant professor,
Faculty of Philosophy, University of Belgrade, Serbia
Alla Stepanovna Sidenko, PhD, full professor,
Faculty of Educational Studies, Lomonosov Moscow State University, Russia
Jelisaveta Todorović, PhD, full professor,
Faculty of Philosophy, University of Niš, Serbia

International Advisory board
Ondrej Kaščák, PhD, full professor,
Faculty of Education, University of Trnava, Slovakia
Nataša Lacković, PhD, senior lecturer,
Department of Educational Research, University of Lancaster, United Kingdom
Monika Miller, PhD, full professor,
Institute of Arts, Music and Sport, University of Education Ludwigsburg, Germany
Snežana Lawrence, PhD, senior lecturer,
Department of Design Engineering and Maths, Middlesex University London, United Kingdom
Goran Bašić, PhD, associate professor,
Faculty of Social Sciences, Linnaeus University in Växjö, Sweden
Mitja Krajnčan, PhD, full professor,
Faculty of Education, University of Primorska, Koper, Slovenia
Sofija Vrcelj, PhD, full professor,
Faculty of Philosophy, University of Rijeka, Croatia

Secretaries
Tijana Milešević, Pedagogical Society of Serbia
MA Tamara Injac, Institute of Pedagogy and Andragogy
MA Zorana Pešić, Institute of Pedagogy and Andragogy

Proof reader
Ružica Milovanović

Technical Editor
Jelena Panić

Printed by
„Službeni glasnik"

Number of copies
50

Publishing of the journal is financially supported by
Ministry of Science, Technological Development and Innovation of the Republic of Serbia and Faculty of Philosophy, University of Belgrade

Indexing: SCIndeks, ERIH PLUS, CEEOL, Redalyc

The Journal is issued three times a year.

Studies in Teaching and Education, 2026, *75*(2), 399-419
https://doi.org/10.5937/niv75-65332

ISSN 0547-3330
eISSN 2560-3051
Original research paper

The Possibilities of Applying Artificial Intelligence and Digital Tools in the Teaching of International Relations

Zoran Pešić[1]
Faculty of Business Studies and Law, Union - Nikola Tesla University,
Belgrade, Republic of Serbia

Abstract *This paper aims to present and analyze the possibilities, scope, and limitations of the application of artificial intelligence (AI) and digital tools (DT) to the teaching of International Relations, drawing on the specific characteristics of this academic discipline and contemporary trends in the digitalization of education. It examines the extent to which AI and DT can be integrated into the teaching process without generating adverse effects for both educators and students. The paper is structured into three parts: a theoretical framework, highlighting the relevance of AI and DT for the study of International Relations; a practical elaboration of their application in the teaching process; and an analysis of the implications and challenges regarding their use. Three principal areas of application are identified, with particular emphasis on the methodological and didactic preparation of educators, personalized learning, real-time analysis of international events, as well as the drafting and analysis of documents and the forecasting of trends at the level of the international system. The paper underscores the role of AI and DT in enhancing the learning process, fostering digital literacy, and bridging the gap between theory and practice. A range of digital tools and application fields are presented, along with their specific implementation in selected teaching units within the course International Relations. At the same time, the paper addresses the broader implications of the use of new technologies, including ethical dilemmas, data protection concerns, algorithmic bias, academic integrity, as well as the risk of student passivity and the erosion of critical thinking. The study employs an analytical-synthetic method, along with the methods of deduction, analogy, generalization, and concretization. It is concluded that AI and DT can significantly improve the teaching of International Relations; however, their implementation requires a carefully considered approach, clearly defined pedagogical objectives, and appropriate oversight.*

Keywords: *artificial intelligence, International Relations teaching, digital tools, implications, ethical dilemmas.*

1 zoran.pesic@fpsp.edu.rs

Introduction

Artificial intelligence and digital tools, as a new and inevitable part of our reality, have a strong impact on all areas of life, including modern education. Their integration into education is transforming the learning process and opening up new possibilities, beyond the traditional approach. The impact of artificial intelligence (AI) and digital tools (DT) can be reflected in the acquisition of new knowledge, changes in practice, the development of new skills, and in methodological and didactic preparation for teaching. International relations (IR) and foreign policy (FP), as well as the contemporary world as a whole, are changing rapidly and dynamically, causing textbooks, even journal content, to become outdated very quickly. The use of artificial intelligence and modern digital tools enables students to study the subjects of international relations, their behavior, diplomacy, conflicts, and public opinion in a unique way and in real time, by analyzing a multitude of influencing factors. In this manner, global and regional trends can be identified more quickly, contributing to a better understanding and prediction of political processes. However, despite their significant potential and positive effects, the application of AI and DT also generates risks that raise technical, methodological, humanistic, and ethical dilemmas. In this context, the key issue is not the use of these technologies itself, but rather the question of their control and governance. The aim of this paper is to present and analyze the possibilities for applying AI and digital tools in the teaching of international relations, with particular emphasis on their potential, limitations, and role in the educational process. At the same time, the application of AI and digital tools should not create negative consequences or additional challenges for lecturers and students.

The social significance of applying AI and DT in the teaching of IR is reflected in new approaches to knowledge acquisition, the expansion of knowledge, and the preparation of students for an increasingly complex and interconnected global reality. From a scientific perspective, these tools are revolutionizing research and learning methodologies, thereby strengthening the empirical foundation of the discipline and encouraging interdisciplinarity. This includes, for example, linking international relations with computer science, pedagogy, and other fields, which enables a teaching approach focused on interpretative skills, analytical abilities, and ethical assessment, rather than solely on the acquisition of facts. The importance of this topic also lies in the concrete proposals for the application of AI and DT in the teaching of international relations, as well as in the fact that the academic community has rarely addressed this issue.

Theoretical Framework

International relations (IR) as a field is defined as "the study of relations between IR actors, the processes that arise among them, their interdependence, development, conditionality, and organization, with the aim of understanding their nature, predicting their development, and assessing their possible practical impact" (Pešić, 2023, p. 17). Such a broadly defined subject points to the complexity of the discipline, as it

encompasses both the phenomena that fundamentally belong to international relations and those that indirectly influence their dynamics. More specifically, international relations study the functioning of the international system, which is anarchic due to the absence of a supranational authority, which further complicates the possibilities of prediction. Within this framework, the role of states and other actors is analyzed, with their relations ranging from cooperation to conflict. However, reducing these relations to a cooperation – conflict dichotomy proves insufficient and requires the application of different theoretical perspectives. Accordingly, international relations as a discipline, in addition to description and explanation, also strives toward prediction and, to a limited extent, prescription of actors' behavior. Although the formulation of universal solutions is often unattainable, in certain contexts it is possible to offer analytically grounded recommendations. It is precisely within this space that the potential for the application of AI and digital tools emerges. The use of AI and digital tools in the teaching of international relations can only be properly understood within broader theoretical approaches to the discipline. Contemporary scholarly debate is developing around the dilemma of whether AI represents a new variable within existing theoretical paradigms or raises the question of the need for new analytical frameworks. In the literature, particular attention is given to discussions of AI as a factor transforming power and security relations (Bode, 2024), as an object of global governance (Emery-Xu et al., 2024), and as a challenge that calls for a re-examination of traditional concepts of sovereignty, actors, and decision-making (Srivastava & Bullock, 2024). Different theories of IR, through their key concepts, offer varying perspectives on the role of knowledge, data, and analytical tools in understanding international reality. From a realist perspective, teachers and students can analyze power, identify patterns of behavior, and predict the behavior of actors. From a liberal perspective, the importance of international institutions and interdependence are analyzed, whereby AI and DT contribute to the examination of complex interactions and processes of global governance. Through the analysis of discourse, identity, and interpretations from a constructivist perspective, students and teachers also raise the question of the extent to which algorithmic systems can adequately understand socially constructed meanings and narratives that shape international relations. However, if the application of AI in the teaching of IR depends on instructors and relatively controllable factors, the problem of governance in practice remains open, as there exists only a "fragmented structure of global AI governance" (Klein & Patrick, 2024, p. 30), which resembles the anarchic nature of the international system at present. Because AI is redefining the traditional understanding of power and becoming its primary exponent, there is a discrepancy between those who develop it and the need for its global regulation.

Artificial intelligence "refers to the simulation of human intelligence processes by machines. AI enables machines to perform tasks that typically require human intelligence. These tasks include learning, reasoning, pattern recognition, problem-solving, prediction, perception, and understanding language" (Center for Innovation, Design, and Digital Learning, 2024, p. 10). These tasks are applied, to a greater or lesser extent, in international relations in various ways and roles.

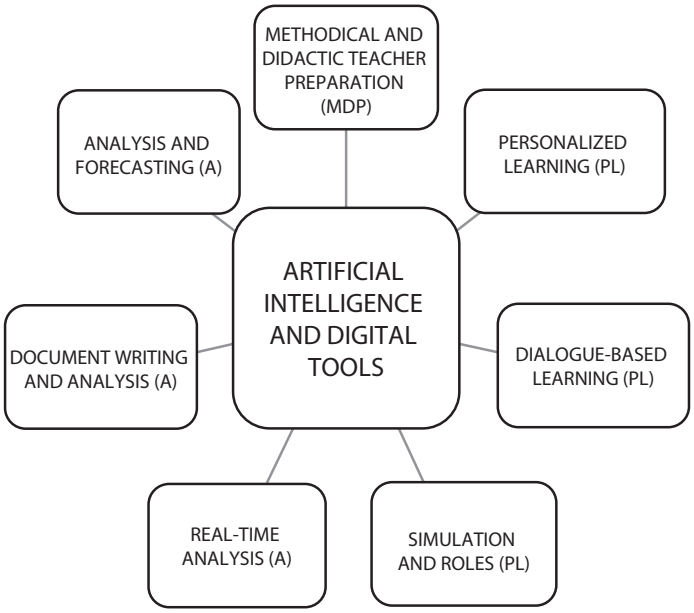
The consideration of applying AI and digital tools in the teaching of international relations requires a clear theoretical distinction and conceptualization of these terms. Artificial intelligence refers to the systems capable of processing data, recognizing patterns, and making decisions based on algorithmic models, while digital tools encompass a broader range of software solutions that support the collection, organization, and presentation of information. In the context of teaching, this distinction has significant implications. While digital tools primarily provide technical support for the teaching process, systems based on artificial intelligence have the potential to influence the learning process itself through content personalization, data analysis, and the generation of new information.

Artificial intelligence is most prominently manifested in IR practice through the use of information technologies in foreign policy, diplomacy, data collection, and analysis. In the security domain, it fosters the development and use of sophisticated systems and combat capabilities. It increasingly transforms power in both theoretical and practical terms, becoming the subject of intensive diplomatic activity and creating new relationships, alliances, and divisions. In accordance with offensive realism, "states use artificial intelligence to maximize relative power, often at the expense of undermining global stability" (Garrido Rebolledo, 2025, p. 13). This, of course, affects IR, the discipline of IR, and established theoretical paradigms. The reason is that IR theories analyze international events from an "anthropocentric perspective, whereas AI analyzes situations in various areas of international relations through algorithms, shapes them and constructs them, therefore influencing the decision-making process" (Kardumyan, 2025, p. 132). At the same time, the field of IR must follow and adapt to international events in the world, as well as changes within the academic discipline. In this context, the way teaching, learning, and the application of knowledge are carried out is of exceptional importance. Traditional teaching methods are not able to adequately represent the full complexity and dynamism of changes in IR, nor are they sufficient for students' knowledge and understanding. Teaching requires significantly greater inventiveness on the part of instructors, and interactive engagement and knowledge acquisition from students. On the other hand, changes bring both advantages and risks, and the teaching of international relations is not immune to this. Among other things, AI in education "also brings significant ethical dilemmas and challenges, particularly in the areas of data security, user privacy protection, and algorithmic bias" (Felaco et al., 2024, p. 239).

Opportunities for the application of artificial intelligence and digital tools in the teaching of international relations

In the teaching process, artificial intelligence can play the role of comprehensive support for the instructor, from lesson preparation, through its delivery, to the assessment and evaluation of learning outcomes, thereby contributing to higher-quality and more efficient student learning. The graphical representation illustrates the breadth of possibilities for applying AI in teaching.

Figure 1
Application of Artificial Intelligence and Digital Tools in Teaching the Subject IR



Note. Source: Author.

The graphic representation indicates three areas of application: the first relates to methodical AND didactic preparation (MDP), teachers' needs and their preparation for conducting lessons. The second area refers to personalized learning (LP), in other words, the learning process itself, while the third area consists of analyses.

The methodological and didactic preparation of teachers encompasses both general and specific content.

The general content areas in which AI and (DT) can be applied include:

- Adapting teaching to students – an optimal alignment with the study program, students' expectations, and their level of knowledge.
- Setting learning objectives – acquiring new knowledge and skills and developing attitudes, which involves understanding theories of IR, monitoring and analyzing processes, and adopting a critical approach.
- Selection and structuring of content – choosing a theoretical framework, contemporary actors in IR, and current regional and international issues.
- Didactic approach and selection of methods – includes choosing the form and method of teaching and combining them.

- Selection of teaching resources and sources – textbooks, academic articles, international documents, reports, statistical data, and multimedia content.
- Linking theory and practice – analysis of current events and the foreign policy of specific states.
- Assessment and evaluation of knowledge – oral and written assessment through active participation: presentations, tests, essays, and term papers; development of assessment criteria and self-assessment.

Due to its wide range of applications in the methodological and didactic preparation of teaching, AI requires teachers to be open to innovation and to possess appropriate knowledge for its application, to adopt a more inventive approach to teaching, and to take greater responsibility, while at the same time ensuring the verification of outcomes and adequate stimulation. By being knowledgeable about the use of AI and DT in teaching, teachers prevent "learning from being largely dependent on computer specialists who have a limited understanding of successful pedagogy" (Dimitriadou & Lanitis, 2023, p. 19). In this context, the teacher's role is crucial due to the feedback they provide.

Personalized learning refers to the adaptation of teaching or the transfer of knowledge and skills to the abilities of each individual or a specific group, and "adaptability has been recognized as one of the key ways in which technology can enhance learning" (Cardona et al., 2023, p. 18). However, despite its significant potential, research indicates that in the "individualized approach to students, where the potential scope of AI is considerable, its actual use is almost absent" (Polovina i Dinić, 2025, p. 184). Contemporary literature in the field of AI applications in education indicates that personalized learning can be systematized into three main categories: personalized content recommendation, personalized tutoring and support, and personalized feedback and evaluation (Farhood et al., 2025, pp. 20-22). Based on this classification and "related concepts" (Khalifeh et al., 2026, p. 15), the following section presents specific forms of personalization adapted to the teaching of international relations.

Personalized learning includes the following components:

- Adaptive learning system – the process begins with an AI-based diagnosis of the initial level of knowledge (tests and quizzes) in order to provide an initial adaptation of the teaching framework, after which the system dynamically transforms throughout the entire cycle, tracking the student's individual progress and needs.
- Analysis of learning and level of acquired knowledge – monitoring results and identifying strengths and weaknesses at each stage of the learning process, and proposing pedagogical solutions for each individual.
- Personalization according to learning style – individual preferences are identified for auditory and visual learning, learning through repetition, interaction, direct experience, practical demonstration, or simulation.
- Personalized recommendation of content, lessons, literature, and additional materials in accordance with the student's progress (Farhood et al., 2025).
- Personalized tutoring – AI acts as a virtual tutor that provides support and explanations in real time (Cardona et al., 2023).

- Personalized assessment of knowledge – adapting assessment methods to the student's level of knowledge at different stages of learning.
- Feedback for the teacher – AI provides insight into the level and quality of knowledge acquired by each student individually.

Feedback can be collected for each individual or group, and the effectiveness of teaching can be assessed based on it. Artificial intelligence helps identify key indicators of success, process data, and conduct evaluation. The analysis includes monitoring progress through results in midterm exams, tests, seminar papers, and essays, as well as participation in debates, argumentation, critical thinking, and the connection between theory and practice. Based on the outcomes, an optimal learning style and pace can be identified, as well as weaknesses. The analysis of students' written expression, particularly regarding the use of the conceptual apparatus of IR, the coherence of papers, and the logical consistency of arguments, is also significant. The consistent application of academic integrity rules in writing is also assessed. Research indicates that "the greatest risk is the increase in plagiarism, which is linked to the uncritical and unreflective use of information provided by artificial intelligence" (Polovina i Dinić, 2025, p. 187). Artificial intelligence and DT also assist in risk analysis and in assessing necessary actions and procedures to prevent learning failure. Finally, the use of AI and DT can reduce subjectivity in assessment and promote ethical values. Also noteworthy is the form of AI tutoring that can be applied, for example, in methodological approaches or in controlling the application of predefined phases or steps in analysis or problem-solving carried out by students. In foreign policy, decision-making can be monitored and guided as a model of "standard operating procedures that include a set of rules and procedures applied to given situations" (Pešić, 2023, p. 250). In this context, AI provides "feedback at the level of individual steps (and not only information on whether the solution is correct or incorrect) [which is] probably the key reason why tutoring is extremely effective" (Cardona et al., 2023, p. 19).

Dialogic learning refers to the use of AI for delivering instruction and facilitating discussion. With the help of AI, the teacher can explain course content at varying levels of complexity, particularly key theories, comparing their perspectives and their approaches to explaining international political phenomena.

Simulation and role-playing enable the use of AI to simulate specific events, actors, or institutions and to assume concrete roles. It can act as an opponent or a partner. The student uses a chatbot as a representative of a political option, a state, a theory, an international organization, or as a partner for debate, negotiation, or decision-making. Communication can be either written or spoken.

Real-time analysis refers to the monitoring and interpretation of ongoing events in IR, particularly crisis situations. It includes the following components:

- Monitoring international events using AI tools by analyzing news and open-source information.
- Identification of the key actors in IR involved in the current event.
- Analysis of information sources - their level of credibility and reliability.
- Analysis of narratives and discourse - dominant narratives, attitudes, interests, objectives, means, political messages, and the actors presenting them.

- Application of IR theories in interpreting events - realism, liberalism, constructivism, etc.
- Assessment of possible and alternative scenarios using AI, along with forecasting.
- Data processing and presentation - graphs, maps, and timelines.
- Evaluation of the contribution of AI and DT - assessment of the accuracy of information, bias, and the limitations of AI.
- Preparation of a brief written report or conclusion as the outcome of an analytical–synthetic process.

Real-time analysis assesses students' acquired knowledge and skills and identifies weaknesses that need to be addressed in the further teaching process. At the same time, since it deals with real political relations, their development or outcomes clearly verify students' analytical and predictive abilities, as well as their use of AI and DT.

Document writing and analysis - Artificial intelligence can assist with various analyses; writing essays and seminar papers, where it can help in formulating research problems; selecting sources and documents; identifying key arguments and relevant data; offering different scenarios; comparing specific content, documents, strategies, models, or events; and drawing conclusions, trends, and predictions. For both students and teachers, the analysis of the application of AI and DT in teaching is also important. Document writing and analysis is the most sensitive area of AI application, as it is difficult to draw a clear line between AI "authorship" or "co-authorship" and that of students.

In the teaching of IR, the author introduced students to the methodology of academic writing, and from 2025 onward, it also provided informational guidance on the use of AI and digital tools. While in 2024 the primary issue was plagiarism, from 2025 onward, a sharp increase in the use of generative tools has been recorded. A survey conducted on a sample of 48 students showed that all of them support the use of new technologies, but there is a deficit in functional knowledge of their application. In that year, 24% of students used AI, but only 11% reported it transparently. An analysis of 50 papers in April 2026 showed an increase in usage to 44%, while disclosure of tool use remained low (18%). At the same time, ethical and methodological issues were observed, particularly uncritical information use and fabricated citations. The data are illustrative in nature and they form a part of a broader ongoing research project.

Analysis and forecasting have been deliberately separated from real-time analysis, as they involve the use of tools for visual representations and trend analysis at the level of the international system or community. The reason is that this area involves a multitude of factors, and that AI can quickly and efficiently analyse large volumes of information and data at a global level, which would otherwise require considerable time for a student or researcher. Processed data and the proposed scenarios, based on the past behaviour of IR actors, can enhance the predictability of behaviour, process developments, and outcomes.

Digital tools and recommendations for possible use

In order to successfully use AI in teaching, it is necessary to employ a variety of digital tools. The integration of AI into the educational process is not an isolated act, but rather requires reliance on a broad range of digital tools that represent software and information

and communication technologies. Digital tools encompass a spectrum of software (for content editing, analysis, and simulation), applications for specific tasks, and platforms (for communication, discussion, and collaboration). The use of these tools improves the quality of decision-making and productivity and fundamentally transforms the way knowledge is acquired and transferred. Although "many students struggle with digital literacy and the ability to integrate these tools into their academic work" (Leva et al., 2025, p. 1), their ubiquity and necessity in teaching and research compel all actors in education to master this technology. In IR teaching, digital tools become key for the operationalization of complex theoretical concepts. Regardless of whether they are commercial or free, they enable students to master the subject matter in a practical way and to understand the mechanisms of AI functioning. Building on the previously established conceptual distinction between AI and digital tools, the focus here is on their functional difference within the teaching process. While AI is primarily used for analytical, adaptive, and generative support, digital tools primarily have an organizational, communicational, and operational role in teaching. In IR teaching, this distinction is significant, as different types of tools contribute to the development of different competencies – from analytical and interpretative to organizational and communicative. On this basis, it is possible to classify them according to their functions and the degree of AI application, as shown in Table 1.

Table 1

Classification of artificial intelligence and digital tools in the teaching of international relations according to theoretical and functional application

Type of tool	Tool name	Basic function	AI element	Level of application	Theoretical linkage (IR)	Role in teaching
AI	ChatGPT	Text generation, analysis, simulation	Yes	Analytical / interpretative	Realism / Constructivism	Scenario analysis, negotiation simulation
AI	DeepSeek	Data analysis, response synthesis	Yes	Analytical	Realism	Trend prediction
AI	Grammarly	Context-based linguistic analysis and correction	Yes	Support for writing, stylistic and grammatical correction	Liberalism	Academic writing, focus on power and data
AI	Elicit	Search for academic papers	Yes	Research-based, Semantic analysis	Liberalism Positivism	Literature analysis
DT	Voyant Tools	Text analysis	No	Descriptive	Constructivism	Discourse analysis
DT	Kialo	Argumentation	No	Interpretative	Constructivism	Debate
DT	Khartis	Visualization	No	Descriptive	Realism	Geopolitics
DT	Google Docs	Collaboration	Hybrid	Technical / cognitive	Liberalism	Group work
DT	Canva Graphs / Infogram	Data visualization and infographics	No	Descriptive	Liberalism	Visualization and mapping

Source: Author.

What can be drawn on the presented classification is that the choice of DT is not random, but is directly determined by the theoretical framework and the didactic objectives of the lesson. At the same time, the classification highlights the essential difference between AI-based tools and the broader range of digital tools, as well as their potential application in IR teaching. AI-based tools enable advanced analytical and interpretative processes, including content generation and the simulation of complex international interactions. In contrast, DT without AI components primarily have a supportive role, enabling the organization, visualization, and structuring of teaching content. Of particular importance is the linking of these tools with theoretical approaches in IR (realism, liberalism, constructivism), which enables their functional integration into teaching. In IR, these tools primarily develop students' digital literacy, and they also have a motivating effect, especially in processing an overwhelming amount of data, initiating conceptual solutions, and ultimately contributing to active learning through practical application.

Applications of artificial intelligence and digital tools on the analysis of topics in international relations

Specific content, or the concretization of AI application in the teaching of IR, can be diverse and depends on several factors, starting from the teacher's knowledge and skills, the objectives to be achieved, the available time and resources, the scope of the curriculum, and the students themselves. The basic programme aims to provide fundamental knowledge in IR, including processes and trends in practice, as well as to develop skills for their analysis and to ensure that students acquire adequate competencies for practical application and for use in an expert environment. Since the content and objectives at the basic academic level do not differ substantially between faculties, the following section outlines possibilities for addressing topics with the help of AI and DT. The models are illustrative and do not have a normative character; rather, they represent an analytical framework for considering potential ways of integrating AI and digital tools into the teaching process. Table 2 illustrates the basic academic programme of IR studies and the application of AI and DT in its acquisition.

Table 2

Application of AI and digital tools in the analysis of topics in the basic academic studies of international relations

SN	Topic title	Method of processing	Digital tools
1.	Introduction to IR, concept, subject matter and development	Short discussion + individual work: the student generates different definitions of IR from multiple sources and compares them with the definition from the textbook	ChatGPT Perplexity, Google Docs
2.	Method of international relations (approaches and technical procedures)	Group work: selection of a contemporary crisis and proposal of a methodological approach (qualitative/quantitative) with the help of AI	ChatGPT, Elicit (free), Zotero

SN	Topic title	Method of processing	Digital tools
3.	Brief history of IR (Peloponnesian and World Wars, Peace of Westphalia, Cold War, unipolarity, multipolarity)	Interactive timeline + discussion of systemic turning points and comparison with contemporary events	TimelineJS, ChatGPT, Google Sheets
4.	IR theories	Case study: Ukraine, Gaza, South China Sea, Venezuela – analysis from the perspectives of realism, liberalism, and constructivism	TimelineJS, ChatGPT, Google Sheets
5.	Constructivist theory and discourses in IR	Discourse analysis (leaders' speeches, e.g. Trump at Davos 2026, Putin in Munich 2007, declarations) – mini research task	ChatGPT (Text analysis) Voyant Tools
6.	Actors in IR (state, nations, sovereignty, organizations, etc.) State sovereignty vs. human rights (NATO – FRY)	Individual work: mapping actors in a contemporary conflict (USA–Iran) AI dialogue: simulation of a state's position in an international conflict	ChatGPT, Miro, draw.io, Kialo Edu
7.	International organizations (UN, OSCE, NATO)	Simulation of proceedings (Security Council session) Use of AI for searching and analyzing UN actions in a specific case	ChatGPT (role-play), Google Meet, Docs, Perplexity AI
8.	Transnational actors (NGOs, movements, companies, individuals)	Case study: the role of an NGO or company in a global crisis Discussion: the role of individuals in IR and Kissinger's study of six leaders and strategies	ChatGPT, Perplexity, Canva
9.	Factors in IR (geographical, economic, military, moral, legal, etc.)	Group work: ranking factors for a selected state and providing justification Using AI to create influence maps	ChatGPT, Google Sheets, Khartis
10.	Foreign policy – concept, decision-making, actors, and instruments	Simulation of foreign policy decision-making processes (cabinet, government, Ministry of Foreign Affairs, president) according to political systems	ChatGPT (multi-role simulation), Miro
11.	Regional Policies: The Balkans, the Middle East, and Asia	Group Project: Kosovo and Metohija, Palestine, Lebanon, Taiwan - Consequences for States and the International System	ChatGPT
12.	Serbia's Foreign Policy and Its Determinants	Analytical Exercise: Identification of Determinants for Serbia and a Comparative State Case Study: Serbia's Foreign Policy Priorities in the Context of Multipolarity	Perplexity, Google Docs, ChatGPT, Elicit, Zotero
13.	The Future of International Relations and the Role of AI	Discussion: How Is Artificial Intelligence Transforming International Relations and the Global Distribution of Power? How Does Artificial Intelligence Affect Education? - An Analysis	ChatGPT

Note. Source: Author.

Within each of the listed topics, it is possible to identify key concepts and analyze them through various forms of teaching activities, including individual and group work, case studies, simulations, and discourse analysis. For example, in the study of the state as the most important actor in IR, it is possible to examine the relationship between national identity, interests, and sovereignty through the interpretation of political speeches and practical policies. In diplomacy and negotiation, AI can serve as a simulation actor in negotiations on a real or fictional topic, enabling students to develop argumentation and strategic skills in a controlled environment. Similarly, in the analysis of global security and power, digital tools (DT) enable the collection and processing of data on interventions by major powers, opening space for comparative analysis of their effectiveness and theoretical interpretation. At the same time, the integration of AI and DT into the teaching process also raises methodological and ethical issues in the preparation of essays, seminar papers, and exercises. It is desirable that students, at the end, indicate the role of AI and DT in addressing the topic or conducting research, including where and for what purposes they were used, as well as any observed limitations or errors. This contributes to improving their application and to distinguishing the roles of the student and digital technology. The analysis of the role of AI and DT should also be present at the end of each chapter and after completed units, in order for the teacher to obtain feedback on their contribution. In this way, we arrive at different implications of the use of digital technology. The analysis so far indicates that AI and DT offer significant potential for improving education, but at the same time also generate challenges such as "access issues, inherent algorithmic bias, and the need for comprehensive teacher training" (OECD, 2024, p. 4).

Implications of the use of artificial intelligence

Challenges of the digital environment and value-based aspects of teaching

Just as AI can deepen the educational gap between developed and developing countries (Klein & Patrick, 2024, pp. 30-33), its use can also create differences among students. Not all students have the knowledge and skills required to use it, and this must be taken into account in the teaching process. The level of digital literacy must be continuously improved among both teachers and students, as it is "of crucial importance for improving the quality of teaching, building a high-quality and modern educational system, as well as for educating highly qualified personnel" (Yi & Wang, 2025, p. 79). The traditional approach to education has relatively ensured equal access to information and course content for all students, with the same teaching methods, exercises, and assessment approaches being applied. Artificial intelligence introduces major changes, and its purpose is to enhance teaching and knowledge acquisition, not to reproduce new inequalities that over time become socially accepted. Therefore, AI must promote equality in knowledge acquisition and accessibility for all, while its new forms of transparency and personalized approaches must ensure the protection of personal data. At the same time, the application of AI should not negate the values of the traditional approach to learning. If the student is reduced to a mere consumer of information and

generated conclusions, and their role is simplified to that of a transmitter of knowledge rather than a creator of new knowledge, then AI fails to serve its purpose. The traditional approach required more interaction, as the study of complex problems demanded teamwork, mutual division of responsibilities, and complementarity-elements that may be lost with AI. Artificial intelligence assists, learning processes, but it also dehumanizes them in a sense, and reduces them to algorithmic content that is inherently limited and conditioned by the instructions it is given. Artificial intelligence, available to both students and teachers, can offer a large amount of information, present it and analyze it, but it cannot critically and in a nuanced way interpret real-world events or place them within a specific context (Cardona et al., 2023, pp. 34-35). AI-based tools can function as "machines for ready-made solutions … [and reduce the practice of] deep reading, thereby directly undermining the foundation necessary for the development of critical thinking" (Hassen, 2025, p. 82). The views of 141 teachers in a study in Serbia on the risks of using AI in teaching indicate a high risk of plagiarism, while "individual competencies - time spent online, development of critical thinking, and individual autonomy - show a tendency toward moderate and high risk, suggesting that frequent use of AI… may jeopardize the further development of personal competencies" (Polovina i Dinić, 2025, p. 187). In addition to these, risks related to unverified and inappropriate content, reinforcement of stereotypes, and misuse are also identified. In a broader social context, AI appears both as something that opens new perspectives and opportunities and as a form of inhibition (Yang et al., 2021, p. 3). Artificial intelligence can also generate specific "feelings that inhibit its use," i.e., various forms of AI-phobia - "literacy, substitutability, accountability, and implementability" - but these forms of resistance can be overcome "through organizational stability, appropriate methodological approaches, and a clearly articulated roadmap" (Lee & Park, 2023, p. 8). Excessive use of AI reduces communication among students, encourages passivity, and diminishes critical abilities developed through interaction. Likewise, the very easy access to content and information, as well as the ease of answering research questions with the help of AI, may lead to a pattern that promotes superficial approaches to problems in IR (Ustiashvili, 2025, pp. 6-7). A form of dependency on AI may also emerge, although research indicates a moderate level of dependency on AI as well as fear of situations without its presence (Sağlam & Kalanlar, 2025).

Beyond all this, AI poses an ethical challenge for all stakeholders, namely how far its use-especially in verifying achievement-is morally justified, and how to define the limits of its use and the boundary between human beings and technology. Therefore, it would be desirable to view the use of AI and DT through three ethical perspectives: virtue ethics, deontological ethics, and teleological ethics. Together, they indicate that the responsible use of AI and DT in education requires establishing a dynamic balance between the development of virtues, respect for normative frameworks, and critical assessment of consequences. Virtue ethics emphasizes the need to integrate AI in a way that fosters students' intellectual autonomy, academic integrity, and critical thinking. The deontological approach insists on clearly defined rules regarding transparency in the use of AI and DT, data protection, fair access to technology, and respect for ethical

principles. At the same time, the teleological perspective warns that the ethical justification of AI and DT depends on their actual effects on educational outcomes, including improvements in learning quality but also risks such as technological dependency and potential reductions in creativity. Therefore, it is necessary to "balance the potential benefits of AI technologies with ethical considerations and the risk of exacerbating existing inequalities" (OECD, 2024, p. 4).

Perceptions and realities of the use of AI and digital tools

In the field of education, there is a significant body of research on the application of AI and DT, particularly in the context of language studies students. A study that analyzes and synthesizes data from 49 studies with 79 reports on language learning identifies key moderators influencing the effectiveness of AI and "shows that AI-based interventions have a statistically significant positive impact on language learning outcomes" (Wu, 2024, p. 1). Although these studies are limited to linguistic issues, in the absence of research in the field of IR, conclusions of universal relevance can still be drawn from them. A study examining students' perceptions of available digital tools and their use at the University of Maribor (Slovenia) "identifies underutilization of institutional tools, limited awareness of available resources, and reliance on general-purpose search engines rather than academic platforms" (Leva et al., 2025, p. 1). This is a consequence of a lack of information about available tools and their capabilities, as well as a lack of knowledge of how to use them. On the other hand, students express a positive attitude toward the use of AI and digital tools and have a high opinion of their own abilities to use them; however, the survey does not confirm this, instead "revealing a consistent gap between self-perception and actual use" (Leva et al., 2025, p. 19). It is confirmed that both students and teachers lack information and adequate knowledge about the availability of digital tools and the scope of AI. Another study indicates that "85.2% of AI use relates to assistance in essay writing, summarizing and paraphrasing texts, generating ideas on how to complete assignments or projects, and even suggesting the content that should be written" (Dakakni & Safa, 2023, p. 7). This suggests that AI is used as a shortcut, often in a non-academic manner, and that it poses challenges in terms of verification and authenticity of work, while all other possibilities remain underutilized. It is little consolation that 100% of students "rejected the possibility of digital bots replacing teachers in the learning process" (Dakakni & Safa, 2023, p. 7). Teachers also express distrust toward AI and would only learn about AI in order to effectively monitor students' use of it. However, distance learning during the COVID-19 pandemic imposed the use of various learning platforms and provided significant experience. The key problem proved to be the lack of physical interaction, partially compensated by technical solutions and teachers' inventiveness, but its irreplaceable value was confirmed. Students in classical education programs "particularly emphasized the value of discourse and direct face-to-face interaction, describing these experiences as a key part of understanding complex global issues" (Ustiashvili, 2025, p. 6). Nevertheless, the problem of reduced interaction can be largely mitigated through the use of applications based on free and open-source

software, as shown in a study (Peterson & Finn, 2024) conducted on a sample of 165 teachers. The study concluded that the use of applications and AI implementation should not depend solely on teachers, but that at the institutional level universities and faculties should "particularly focus on staff support and provide teachers with structured resources, examples of good practice, training, and opportunities for professional development" (Peterson & Finn, 2024, p. 413). A study in China involving 494 students "highlighted the significant role of an environment that supports AI application and that, through expectancy- and value-based beliefs" (Wang et al., 2023, p. 18), encourages students to learn about AI and its application . This encouragement should be provided by teachers and institutions, and subsequently by the wider environment. Another issue in online teaching is attention distraction, which has various causes. Research conducted in Serbia on 281 students indicates that "the environment in which teaching and learning take place is rich in digital distractors" (Cvetković i Opsenica-Kostić, 2024, p. 89), which correlates with reduced attention. One solution is "assigning tasks that have high value for students" (Cvetković i Opsenica-Kostić, 2024, p. 89), or those that require greater attention, creativity, are dynamic, and are grounded in real-life situations. The use of AI in designing such content and solving tasks can effectively compete with other digital distractors. We have already mentioned the importance of AI tutoring in personalized learning. However, the Centre for AI at University College London argues that this aspect receives much more attention than it deserves, as such changes essentially imply the replacement of teachers and are far from offering practical and socially impactful results (Bulathwela et al., 2021, p. 6). Therefore, this approach to investment and resource allocation "carries the risk of misallocating resources that are necessary to address the globally significant lack of access to quality education" (Bulathwela et al., 2021, p. 6). This is of course valid, as even five years after that publication, discussions on AI in education have not progressed much beyond the question of teacher replacement. Furthermore, the absence of standardized and normative global regulation leaves room for states to develop and apply AI in accordance with their own capacities and interests. Although the European Union has made the most progress in AI regulation, it still lags behind the United States and China in its development.

Interesting results have also been obtained in research conducted in Serbia. A study carried out among teachers from all four scientific fields indicates that in Serbia "teachers extensively use digital tools and technologies in teaching – primarily presentations, used by 98.6% of teachers… digital platforms for distance learning 73.8%, various types of online tools such as exercises, questionnaires, quizzes, tests, etc. 64.5%, interactive exercises and applications 31.9%" (Polovina i Dinić, 2025, p. 183). It is evident that the simplest tools are the most widely used, while more complex ones are used to a much lesser extent. Teachers from the social sciences and humanities (SSH) field are leading in this regard, which is somewhat surprising given the potential in other fields. Considering that SSH disciplines deal with human beings as variable and difficult-to-predict actors, who most often act "according to their interests… and are influenced by numerous internal and external variables… it is risky to apply principles valid in the natural and technical sciences to variable elements" (Anđelković i sar., 2023, p. 86). Therefore, the application of

AI and DT requires additional caution. Research results show that teachers possess digital competencies, engage in further professional development, and use digital resources by modifying and adapting them. However, overall only "41.8% have used some form of AI in teaching, while [teachers in SSH fields] 61.5%" (Polovina i Dinić, 2025, p. 184). Another study, conducted on 74 teachers, also points to insufficient application of AI in practice; "although the broader discourse often speaks of rapid digitalization, data show that there is a gap between the potential offered by AI and its actual application in the classroom… [and the reasons are] limited teacher competence … and lack of systemic support" (Šović, 2025, p. 15). In IR teaching, there is certainly potential for even greater and more creative application, as AI is most often used for acquiring knowledge of course content, and "significantly less for teaching implementation (26.7%) and very rarely for assessing student achievement (5.7%)" (Polovina i Dinić, 2025, p. 184).

The aforementioned studies have produced additional findings and highlighted certain problems. For example, the accuracy of information provided by AI and online platforms in general is checked by "only 47% of undergraduate and 65% of master's students" (Leva et al., 2025, p. 20). Among teachers in the social sciences and humanities (SSH) field in Serbia, 53.8% always verify information, while 23.1% do so occasionally, which represents a stable majority (Polovina i Dinić, 2025, p. 185). These indicators point to the need to continuously emphasize, at all stages of education and AI/digital tool use, primarily to students but also to teachers, the importance of verifying acquired knowledge and obtained information, as well as using multiple sources in order to ensure academic validity of results. In addition to the benefits of using AI and DT, security and privacy protection must always be a priority, as they evolve alongside the development of AI. Although privacy is often secondary to the primary interest of facilitating academic work, research "indicates that students in the educational process demonstrate strong competencies in the areas of security and privacy protection, while there is still significant room for improvement in skills related to digital content creation and problem-solving" (Yi & Wang, 2025, p. 81). On the other hand, teachers show a higher level of awareness of security risks, which does not eliminate the need for further security education, but the focus should be placed on the application of AI and digital tools in concrete tasks within specific subjects. Within a study conducted in Serbia on education in the field of AI and DT, it was observed that "the majority of teachers believe that it is not their responsibility to educate students about AI" (Polovina i Dinić, 2025, p. 184), considering this to be the responsibility of institutions or the students themselves-a position that can be understood, but not fully supported. This points to a problem of responsibility distribution and a potential gap in the institutional approach to developing AI and digital literacy.

Compared to the sometimes more passive reception of information and knowledge in traditional teaching methods, AI is more demanding and opens up new perspectives and challenges. Additional problems arise from the volume of information generated by AI, which makes selection and critical evaluation more difficult, as well as from limited access to relevant databases. This is particularly pronounced in the field of IR, where complete information about decision-making processes, the factors shaping them, and the actors with decisive roles is often lacking. In security studies and IR, some data remain

classified or become available only many years later. In more demanding research, there is a need for much more advanced tools, but these are generally paid and therefore have limited accessibility.

Guidelines for improving the application of AI and digital tools in teaching

The results of the aforementioned studies shed light on the attitudes of students and teachers towards digital technologies, which must be taken into account despite certain differences, as their alignment is crucial for a more effective and sustainable application of these technologies in teaching. Teachers and students are in an interactive relationship with institutions, whose responsibility is unquestionable and which can contribute most significantly to the incorporation of AI and DT into the educational process. The research also points to structural problems whose resolution requires a systemic approach to AI and DT in education - from the societal level and policymakers to the entire education system. This implies a clear understanding of the benefits and challenges of applying AI and DT, as well as the formulation of proposals for improving their implementation. A normative framework is an essential prerequisite. In order to maximize benefits and mitigate challenges, it is necessary to ensure institutional support through resources, training, and technical infrastructure, alongside continuous education of both teachers and students to enhance digital competencies. Of particular importance is the implementation of a hybrid teaching model, in which technology complements, but does not replace, the pedagogical role of the teacher. The implications of applying AI and DT primarily relate to the transformation of the teacher's role – from a transmitter of knowledge to a facilitator, critical mediator, and designer of the learning process. At the same time, it is necessary to establish a clear ethical and regulatory framework that ensures transparency and data protection, as well as to design creative learning tasks focused on solving real-world problems, thereby fostering engaged and critical learning.

Based on the above, and as a summary, a concise tabular overview of the key implications of the use of AI and DT is provided.

The above table does not cover all benefits, challenges, and recommendations, given the dynamic development of AI and DT. This is particularly evident in the emergence and continuous improvement of existing platforms, which leads to intense competition in their development and application. Although Serbia faces numerous challenges, it must not lag behind these trends. The existing foundation in the field of computer science represents significant potential that needs to be further institutionally developed and operationalized. Within IR courses, it is necessary to integrate AI and digital tools into teaching content, textbooks, and learning activities, establishing them as standard teaching tools. At the same time, it is necessary to systematically organize training and monitoring of their application. Artificial intelligence and DT can also be the subject of study, but above all they should function as tools and supporting resources, without undermining the central role of the teacher.

Table 3

Artificial intelligence and digital tools in the teaching of IR - benefits, challenges, and recommendations

BENEFITS
• Online resources and databases are expanding • AI enables easy access to analytical tools • Unlimited availability in terms of time and place, and partly in terms of content as well • Digital tools are relatively easy to manage and use • The results, scope, and speed, along with a user-friendly experience, act as an incentive for the application and integration of AI and DT in education • Greater degree of predictability in IR and security studies (SS) • Development of a new form of interactive engagement • A new quality of teaching, exercises, and assessment of performance • Support for blended learning systems • Automated processing of large volumes of data • Adaptability to individuals and different groups across multiple dimensions • Requires continuous professional development of both teachers and students
CHALLENGES
• Slow adaptation of the education system and of specific IR programmes and courses • Lack of integrated AI tools for IR and security studies (SS) • The quality and scope of AI and DT use depend on costs • Insufficient expertise among teachers and students • Limited availability of relevant information in IR affects reliability • Bias in AI models, i.e., the tendency of models to produce biased outputs or to favor certain content and patterns • Reduction of students' critical thinking and creativity • Increased interaction with AI may dehumanize users • Possible distraction due to the large volume of data • Misuse for non-academic purposes and the development of unfair advantages • Resistance to the application of AI and DT in teaching • Data protection and confidentiality issues • Choosing an appropriate model for learning about AI and DT
RECOMMENDATIONS
• Integration of AI and digital tools into IR courses and teaching materials • Technical support through equipment and modern software at faculties • Continuous institutional updating of digital tools and software • Strengthening institutional support and transparent procedures • Training and support for teachers in the application of AI in teaching • Periodic training of both teachers and students on AI and digital tools • Development of simple and functional user guidelines • Periodic surveys of students on the use of AI and digital tools • Linking the teaching process, regulatory frameworks, and practice through the application of AI and DT

Source: Author.

Conclusion

The analysis of the possibilities for applying artificial intelligence and digital tools in the teaching of international relations shows that these technologies have significant potential to enhance IR teaching, primarily in the development of students' analytical, interpretative, and research skills. At the same time, the paper has highlighted the need for a clear conceptual distinction between AI and digital tools, which is a prerequisite for a more precise theoretical and practical analysis of their role in teaching.

Starting from the set objective, it can be concluded that the integration of these technologies can be achieved in an effective and pedagogically justified manner, provided that teachers' digital competencies are developed, learning outcomes are clearly defined, and a critical approach to information sources is applied. It is emphasized that the application of technology does not imply uncritical use, but rather a controlled and purposeful integration that does not compromise academic integrity and ethical standards. Although AI and digital tools represent a qualitative innovation, they do not serve as a replacement for the teacher, but rather as a means that fosters inventiveness and enables more dynamic teaching. Despite the recognized advantages, significant risks have also been identified – ranging from algorithmic bias to the danger of superficial knowledge acquisition – which necessitates systematic monitoring of their use.

The current gap between technological potential and actual implementation in educational institutions suggests that a hybrid teaching model is the most appropriate solution. In such a model, traditional learning methods are synergistically combined with innovative tools, while the role of the teacher remains central and indispensable. Finding the optimal balance between these approaches, particularly in the domain of learning personalization, represents a key direction for future empirical research.

Finally, the integration of AI and digital tools into IR teaching represents an inevitable direction of development. Its success will fundamentally depend on how these tools are conceptualized and evaluated, with continuous emphasis on ethical criteria and qualitative assessment of their effects on students' knowledge and skills.

References

Anđelković, M., Grbić, D., Radosavljević, M., i Zdravković, B. (2023). Primena veštačke inteligencije u pravu, ekonomiji i menadžmentu - izazovi, pretnje i šanse sa osvrtom na Srbiju. *Godišnjak FITI, 1*(1), 85-116. https://www.fiti.edu.rs/sr/conferences-journals/antim

Bode, I. (2024). AI technologies and international relations: Do we need new analytical frameworks? *The RUSI Journal, 169*(5), 66-74. https://doi.org/10.1080/03071847.2024.2392394

Bulathwela, S., Pérez-Ortiz, M., Holloway, C., & Shawe-Taylor, J. (2021). Could AI democratise education? Socio-technical imaginaries of an EdTech revolution. In *35th Conference on Neural Information Processing Systems* (pp. 1–9). Cornell University. https://doi.org/10.48550/arXiv.2112.02034

Cardona, M. A., Rodríguez, R. J., & Ishmael, K. (2023). *Artificial intelligence and the future of teaching and learning: Insights and Reccomendations*. U.S. Department of Education, Office of Educational Technology. https://www.ed.gov/sites/ed/files/documents/ai-report/ai-report.pdf

Center for Innovation, Design, and Digital Learning. (2024). *Artificial intelligence: The impact of AI on education for all learners*. Center for Innovation, Design, and Digital Learning. https://ciddl.org/wp-content/uploads/2025/03/Artificial-Intelligence-The-Impact-of-AI-on-Education-for-All-Learners.pdf

Cvetković, K., i Opsenica-Kostić, J. (2024). Percipirana akademska kontrola, vrednost zadatka i sklonost ka digitalnoj distrakciji tokom onlajn učenja: Medijaciona uloga dosade. *Nastava i vaspitanje, 73*(1), 107-123. https://doi.org/10.5937/nasvas2401075C

Dakakni, D., & Safa, N. (2023). Artificial intelligence in the L2 classroom: Implications and challenges on ethics and equity in higher education: A 21st century Pandora's box. *Computers and Education: Artificial Intelligence, 5*, 1-10. https://doi.org/10.1016/j.caeai.2023.100179

Dimitriadou, E., & Lanitis, A. (2023). A critical evaluation, challenges, and future perspectives of using artificial intelligence and emerging technologies in smart classrooms. *Smart Learning Environments, 10*(1), 1-26. https://doi.org/10.1186/s40561-023-00231-3

Emery-Xu, N., Jordan, R., & Trager, R. (2024). International governance of advancing artificial intelligence. *AI & Society, 40*, 3019–3044. https://doi.org/10.1007/s00146-024-02050-7

Farhood, H., Nyden, M., Beheshti, A., & Muller, S. (2025). Artificial intelligence-based personalised learning in education: A systematic literature review. *Discover Artificial Intelligence, 5*, 1-41. https://doi.org/10.1007/s44163-025-00598-x

Felaco, C., Amato, F., & Aragona, B. (2024). Digital methods for social sciences. *Mathematical Population Studies, 31*(4), 237-241. https://doi.org/10.1080/08898480.2024.2414653

Hassen, M. Z. (2025). The impact of AI on students' reading, critical thinking, and problem-solving skills. *American Journal of Education and Information Technology, 9*(2), 82-90. https://doi.org/10.11648/j.ajeit.20250902.12

Kardumyan, V. (2025). The impact of artificial intelligence on international relations: Are current paradigms still relevant? *YSU Journal of International Affairs, 16*(1), 116-135. https://doi.org/10.46991/jia.2025.1.1.116

Khalifeh, F., Santiago, R., & Palau, R. (2026). Redefining personalized learning in the artificial intelligence era: An updated systematic review from 2019 to 2025. *Smart Learning Environments, 13*(1), 1-20. https://doi.org/10.1186/s40561-026-00440-6

Klein, E., & Patrick, S. (2024). *Envisioning a global regime complex to govern artificial intelligence*. Carnegie Endowment for International Peace.

Lee, J., & Park, J. (2023). AI as "Another I": Journey map of working with artificial intelligence from AI-phobia to AI-preparedness. *Organizational Dynamics, 52*(3), 100994. https://doi.org/10.1016/j.orgdyn.2023.100994

Leva, B., Onič, T., Todorović, T., Urh, J., & Hazemali, D. (2025). Student perceptions of digital tools in language and translation programs: A survey-based case study at the University of Maribor, Slovenia. *Education Sciences, 15*(9), 1119. https://doi.org/10.3390/educsci15091119

OECD. (2024). *The potential impact of artificial intelligence on equity and inclusion in education*. https://www.oecd.org/en/publications/the-potential-impact-of-artificial-intelligence-on-equity-and-inclusion-in-education_15df715b-en.html

Pešić, Z. R. (2023). *Međunarodni odnosi*. Fakultet za poslovne studije i pravo Univerziteta Union - Nikola Tesla.

Peterson, S., & Finn, D. (2024). Free and open source systems: Their value for engaging learners in online settings. *Active Learning in Higher Education, 26*(2), 413-424. https://doi.org/10.1177/14697874241257883

Polovina, N. Ž., i Dinić, T. D. (2025). Univerzitetska nastava u doba digitalizacije i veštačke inteligencije - stavovi nastavnika. *Anali Filološkog fakulteta, 37*(2), 177-194. https://doi.org/10.18485/analiff.2025.37.2.9

Rebolledo, V. G. (2025). Impact of the artificial intelligence on international relations: Towards a global algorithms governance. *UNISCI Journal, 67*, 9-51. https://doi.org/10.31439/UNISCI-219

Sağlam, R. K., & Kalanlar, B. (2025). Living with and without AI: A mixed-methods study on AI usage, addiction, and 'Allessphobia' in nursing students. *Nurse Education in Practice, 88*, 104530. https://doi.org/10.1016/j.nepr.2025.104530

Srivastava, S., & Bullock, J. (2024). *AI, global governance, and digital sovereignty*. https://doi.org/10.48550/arXiv.2410.17481

Šović, M. V. (2025). Mišljenje nastavnika o primeni veštačke inteligencije u promeni paradigme obrazovanja. *Sinteze, 14*(27), 1–18. https://doi.org/10.5937/sinteze14-57869

Ustiashvili, S. (2025). *From textbooks to algorithms: The transformative impact of AI on teaching international relations compared to traditional classroom dynamics* [Conference presentation]. International Research Conference on Education & English Language, Tbilisi, Georgia. https://www.academia.edu/143100065/From_Textbooks_to_Algorithms_The_Transformative_Impact_of_AI_on_Teaching_International_Relations_Compared_to_Traditional_Classroom_Dynamics

Wang, F., King, R. B., Chai, C. S., & Zhou, Y. (2023). University students' intentions to learn artificial intelligence: The roles of supportive environments and expectancy–value beliefs. *International Journal of Educational Technology in Higher Education, 20*, 1-21. https://doi.org/10.1186/s41239-023-00417-2

Wu, X.Y. (2024). Artificial intelligence in L2 learning: A meta-analysis of contextual, instructional, and social-emotional moderators. *System*, 126, 103498, 1-20. https://doi.org/10.1016/j.system.2024.103498.

Yang, S. J. H., Ogata, H., Matsui, T., & Chen, N. S. (2021). Human-centered artificial intelligence in education: Seeing the invisible through the visible. *Computers and Education: Artificial Intelligence*, *2*, 100008, 1-5. https://doi.org/10.1016/j.caeai.2021.100008

Yi, W., & Wang, S. (2025). Digital literacy education among students: Status, pathways, and implications in the current digital era. *International Journal of Education and Teaching Zone*, *4*(1), 66–85. https://doi.org/10.57092/ijetz.v4i1.385

Article received: 02.03.2026.
Updated version received: 23.04.2026.
Accepted for publishing: 12.05.2026.

Zoran Pešić
Faculty of Business Studies and Law, Union - Nikola Tesla University, Belgrade, Republic of Serbia
https://orcid.org/0000-0003-3549-6897



This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Studies in Teaching and Education, 2026, *75*(2), 421-436
https://doi.org/10.5937/niv75-63543

ISSN 0547-3330
eISSN 2560-3051
Original research paper

Education on Climate Change Mitigation and Artificial Intelligence – Critical and Empirical Analysis[1]

Uroš Ćemalović[2]
Institute of European Studies, Belgrade, Serbia

Abstract *Artificial Intelligence (AI) presents a range of new threats and opportunities across numerous critical public sectors, including education. While the aspiration to develop a genuinely human-centric AI may appear idealistic, increasing resources are being devoted to this goal. Another globally significant issue is climate change mitigation, yet most university curricula inadequately address – or entirely omit – this topic. This article critically explores the risks and potentials of AI in education on climate change mitigation, focusing on the extent to which AI tools in this domain are cross-disciplinary, accessible and impactful. To evaluate AI's role in education, learning, and teaching methods (AIED), the author employed two primary methodological approaches, placing the focus of scientific interest on the concepts related to interactions between AIED systems and human decision-makers, as well as on their applicability in education on climate change mitigation. First, a critical review of the existing scientific literature on AIED was conducted, focusing on its relationship with educational programs and methods dedicated to climate change mitigation; when it comes to the place of AI in educational ecosystem, the recent studies have expressed the most substantial criticism regarding the issues of major economic and, to a lesser extent, political reasons that have led to its introduction. Second, the evaluation of the impact of AI in education on climate change mitigation was based on two adapted questionnaires, while descriptive and inferential statistical methods were used to process the gathered data. The findings indicate that AI-assisted educational tools specifically tailored to climate change mitigation are significantly more effective in achieving pedagogical objectives than general AI-based tools, allowing their wider use in educational practice. However, challenges remain regarding risks and accessibility, limiting their broader adoption and impact.*

Keywords: *education; climate change mitigation; Artificial Intelligence (AI) in education; sustainable development.*

1 This research was funded by the Future of Life Institute, under the 2024 Grant Program (UN SDG Goals)
2 urke2626@yahoo.fr

Introduction - purpose and context of the research

After the adoption of the 2030 Agenda for Sustainable Development by the Member States of the United Nations, the 17 Sustainable Development Goals (SDGs), broken down into 169 targets, have become a "shared blueprint for peace and prosperity for people and the planet" (United Nations [UN], The 17 Goals, 2015). While some members of the scientific community have expressed certain criticism regarding the way SDGs are formulated – estimating that they are "inconsistent, difficult to quantify, implement and monitor" (Swain, 2018, p. 341), but also criticizing them "for reproducing a universal template grounded in a western and neoliberal ideology" (Arora-Jonsson, 2023, p. 2) – it is difficult to deny that the SDGs represent a good global and universally known common ground, both for governmental and civil society activities, as well as for further reflection within the widest expert and scientific fora.

The moto of the SDG 13 (Climate Action) is "take urgent action to combat climate change and its impacts". No one serious denies the more and more harmful consequences of climate change all over the globe, with "climate records […] shattered in 2023 [and] the communities around the world suffering the effects of extreme weather, which is destroying lives and livelihoods on a daily basis" (UN – Progress towards the Sustainable Development Goals, 2024, p. 19). As one of three targets within SDG 13, Target 13.3 (Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning) tackles one of the crucial issues of climate action – the need to adapt the way we learn, teach and inform about climate change mitigation. Unfortunately, the results achieved in this field are very modest. According to the latest Progress Report of the UN Secretary-General, "a study in 2023 of more than 530 grade 9 science and social science subject curricula found that 69% contained no reference to climate change and 66% made no mention of sustainability" (UN, Progress towards the Sustainable Development Goals, 2024, p. 20). These discouraging findings are, to a certain extent, toned down by adding that "three-quarters of countries reported they have plans to revise their curricula in the next three years to focus more on climate change and sustainability". There is, however, no mention on how those "three-quarters of countries" consider to revise the curricula, on which levels, in the context of which subject matters and, above all, using what kind of educational methods and techniques. It is, however, important to note that the process of curricular reforms in this direction was timidly initiated in some countries, while the potential of AI tools in education on climate change has been undoubtedly underscored in the recent scientific literature (Allam et al., 2025; Tapalova & Zhiyenbayeva, 2022; Tarlan & Gerstlberger, 2025). For example, in a report published on 4 September 2024, Oxford, Cambridge and RSA Examinations (OCR) called for the creation of an independent body to maintain a "far more contemporary and forward-looking" curriculum ("England's school curriculum…", 2024), more focused on climate change and sustainability, but also insisting on the need for education about the appropriate use of Artificial Intelligence (AI).

AI has an undisputed aptitude to serve as a tool in improving education, learning and teaching methods (AIED). The objective of this article is to evaluate the specific im-

pact of AI on SDG target 13.3, with a focus on education on climate change mitigation. To do so, the author used two main methods. On the one hand, the research was based on critical examination of the existing scientific research dedicated to AIED, with a special focus on its applicability in various educational programs and methods dedicated to climate change mitigation; the main results are presented in the Chapter "State of the research…" of this article. On the other hand, the evaluation of the future potential impact of AIED on education on climate change mitigation was both qualitative and quantitative, based on two adapted questionnaires; the main results of this aspect of research are presented in Chapters "Results and discussion" and "Projection and conclusions".

Methodological approach

While plethora of studies have already assessed the possible advantages and shortcomings of AI as a tool in improving education, learning and teaching methods (Alfayez & Rasool, 2025; Edam et al., 2024; Yuskovych-Zhukovska et al., 2022; Zawacki-Richter et al., 2019), those exclusively dedicated to the scientifically founded and well documented study on the impact of AIED on climate change mitigation are practically inexistent. However, significant number of recent works include important findings on the use of AI in sustainability teaching and learning (Abulibdeh et al., 2024; Leal Filho et al., 2025), but also addresses the issue of the place of AI in Environmental, Social, and Governance (ESG) education and practice (Correia & Água, 2024; Gupta & Agarwal, 2025; Tarlan & Gerstlberger, 2025).

The key element of the conducted study is qualitative and quantitative evaluation of the impact of AI in education on climate change mitigation. It is based on two adapted questionnaires (Q1 and Q2, more details about the results of the survey in Chapter "Results and discussion"), while descriptive and inferential statistical methods were used to process the gathered data. Due to the lack of sufficiently numerous and detailed data published in peer-reviewed scientific articles, some of the used references are reputed media sources and reports published by international organisations.

Some of the key criteria to determine and measure the impact of AIED on the achievement of SDG target 13.3 were:

1. Level of inclusion of AI-based educational tools in the existing higher education curricula;
2. Level of interoperability of the above tools in natural and social sciences; and
3. Feedback given by educators in their answers to Q2. The results obtained through the surveys were scrutinized and quantified.

The research operated with two big sources of data. This choice was imposed by the complexity of possible interactions between AIED systems and human decision-makers (Gupta & Agarwal, 2025; Holstein & Doroudi, 2021), as well by the nature of interplay between automated and human decision-making (Yuan et al., 2023).

The first bundle of data (see Chapter "State of the research…") was collated through the critical examination of numerous existing studies that have already assessed the possible advantages and shortcomings of AIED; gathered data is then scrutinized, in order to distil whether or not (and, if yes, to what extent) AIED impacted or could impact the realisation of SDG target 13.3.

The second valuable source of data (see Chapter "Results and discussion") was gathered through two different, tailor-made questionnaires (Q1 and Q2).

Questionnaire 1, addressed to the researchers who have already achieved significant results in the field of AI studies, was designed in order to try and distil the climate change related aspects of the existing studies of AIED. Q1 consisted of 16 questions, focusing on how AI may improve education in general and, more specifically, climate-change education, including its current use, perceived impact, and future potential. It also asks respondents to assess changes in curricula, regulatory developments related to SDG 13.3, and the interoperability of AI tools across different academic disciplines. The researchers to whom the targeted questionnaires were sent had been selected on the basis of three combined criteria: 1. recently (2018-2024) published (preferably in WoS indexed journals) papers or internationally recognized books and/or participation in reputable scientific projects related either to the use of AI in education or to the broader societal, ethical or technical issues related to AIED; 2. relatively equal geographic distribution; 3. inclusion of researchers from different scientific fields, including technical sciences (with understandable preference for social sciences). Due to the limited timeframe for conducting the research and highly selective criteria, the questionnaire was sent only to 14 researchers; this sample is relatively small and does not allow sufficient territorial and disciplinary variety, but provided a solid feedback from sufficiently varied spectre of researchers. More details regarding the response rate, possible reasons for it, as well as the interpretation of results can be found in Chapter "Results and discussion".

Questionnaire 2 (Q2) was sent to the representatives of 52 selected educational and research institutions worldwide and was focused on the recent and most relevant impacts of AI in education and awareness-raising on climate change mitigation. Q2 consisted of 14 questions, exploring whether the respondent's institution uses AI in education or research, whether AI-related topics appear in curricula, and whether AI is seen as useful for improving teaching and learning. It also focuses on AI in climate-change mitigation education by asking about current use, curriculum changes, interdisciplinary interoperability, and the future opportunities and risks of AI-based tools in climate-related education. The institutions to which the questionnaires were sent had been selected on the basis of three combined criteria: 1. relatively equal geographic distribution (no continent neglected); unfortunately, in spite of this effort, the response rate from European and Asian universities was disproportionately higher; 2. cross- or trans- disciplinarity in educational and/or scientific mission of the institution; and 3. estimated reputation of the institution, but entirely disconnected from its excellence in the field of AI-based educational or research methods. Despite the fact that the questionnaire was sent to 52 institutions, only about one half responded; although this sample was limited, it allows a good level of territorial and disciplinary variety. More details regarding

the response rate, possible reasons for it, as well as the interpretation of results can be found in Chapter "Results and discussion".

The key research questions underlying the entire analysis and assuring the complementarity of Q1 and Q2 are the following:

1. When compared in terms of their exigency to reach educational goals, what is the crucial difference between traditional, general AI-assisted educational tools and AI-assisted educational tools adapted to the Education on Climate Change Mitigation (ECCM)?
2. Can AI-assisted educational tools which are adapted to ECCM score higher in cross-disciplinarity and be more adaptable to complex global socio-economic context than traditional and general AI-assisted educational tools?

The main tools used to process and present the gathered data were descriptive and inferential statistical methods, while the four central issues related to which the results of the surveys were systematised are (from general to specific): 1) overall attitude on AI in education; 2) potential of AI-based tools in education on climate change mitigation; 3) evaluation of regulatory changes related to the content of the curricula; 4) presence of AI-related issues in the curricula. General results (above-mentioned issues 1 – 3) have been based on the combined results of the surveys (both Q1 and Q2), while the presence of AI-related issues in the curricula concerned only institutional respondents.

State of the research on AIED and its applicability in education on climate change mitigation – a critical overview

Until now, as of mid-October 2025, and from the perspective of ethical and other value-related considerations, AI has had its least controversial track record in its ability to serve as a tool for improving education, learning and teaching methods. As some authors have appropriately remarked, "all empirical studies […] presented the positive effects of AI techniques on education" (Zhai et al., 2021), while in educational applications, the combination of knowledge-based and data-driven approaches represents a natural path forward (Holmes & Tuomi, 2022), in spite of significant criticism related to fact that the rush to integrate industry-promoted AI tools in education risks "epistemic colonization" (Chatzichristofis, 2026). However, while improved learner outcomes remain the top reason for adopting AI, some point to the dangers of AIED colonialism and asymmetries in power across and between nations (Berliner, 2009; Holmes, 2020).

The most substantial criticism related to the place of AI in educational ecosystem is the one that focuses on the major economic and, to a lesser extent, political reasons that have led to its introduction. In such a context, when practically all AI tools are developed and/or provided by profitable entities – whose unique or predominant objective is to commercialize their services in a way that maximizes economic gain – the needs of learner can easily be overrun by other considerations based on productivity, rapidity and gain. As it was rightfully pointed out, "pursuit of marketable products […] appears to define the general approach of the private sector, rather than any underlying educational

rationale for the design and development of AI applications" (Knox, 2020, p. 16). In such a context, tailor-made approach to education, based on learner's individual pedagogical needs, has all the chances to be neglected, and even more so when it comes to online courses (Holstein & Doroudi, 2021; Ortagus, 2023). Therefore, improved learner outcomes mentioned in the previous paragraph can be seen under a different light, allowing to further question the ways they were measured, especially if one takes in consideration that cost savings due to automation can significantly compromise the individual approach in learning. Moreover, "AI is, luckily, still unable to 'generate' (or even imitate) inspiration, contemplation, spontaneity and fervour" (Ćemalović, 2020, p. 158), features playing an important role in educational process. A detailed analysis, elaborated in 2022 under the auspices of the Council of Europe by a group of five authors (Wayne Holmes, Jen Persson, Irene-Angelica Chounta, Barbara Wasson and Vania Dimitrova) defined some major threats AIED could represent for human rights, democracy and rule of law. Although this document is most often limited to the description of normative standards, it also includes a good review of the existent studies dedicated to AIED; however, it openly admits that "there is little substantive literature that focuses specifically on, or even mentions in any meaningful way, AI, education and human rights" (Council of Europe, 2022, p. 51).

ECCM is a complex issue and has numerous specificities, out of which the most important are its cross-disciplinary nature, high global socio-economic stakes and exigency to reach educational goals. First, cross-disciplinarity, in principle, requires rapid analytical tools, capable of processing large amount of data in a short time; moreover, it depends significantly on a better teacher learning, based on a "more thoroughgoing ecological framing of teacher professional development" (Ehrenfeld, 2022, p. 489), allowing them to "successfully integrate AI tools while keeping ethical issues like bias and data protection in mind" (Pikhart & Al-Obaydi, 2025, p. 9). Second, high global socio-economic stakes impose the need for effective, universally applicable and decomplexified educational tools, also capable of combating multifaceted prejudices, misbelieves and conspiracy theories about (non)existence of climate change, that are constantly popping-up in numerous countries of the world, especially in times of elections or other moments when important societal choices are made. Third, an exigency to reach educational goals demands rapid, adaptable and universal curricula drivers (Lingard & McGregor, 2013), designed in a way that can easily be integrated in various existing educational modules in elementary and high schools, as well as in educational policy making (Linderoth et al., 2024), which, consequently, can lead to side-lining of "the value of interactions across disciplinary divisions" (Pasque et al., 2009, p. 126). All the above-mentioned specificities taken into consideration, it can be concluded that AI based educational tools in education on climate change mitigation can be, in numerous aspects, more adapted to specific pedagogical goals and learners' needs than AI educational tools in general. Moreover, even some pertinent critical remarks regarding the impact of AI based learning on human rights, democracy, rule of law and privacy (Pikhart & Al-Obaydi, 2025) are not always applicable (or are applicable to a much lesser extent) to AI-assisted education on climate change mitigation.

Due to the novelty of the AIED as a global phenomenon, there is no plethora of recent, structured, detailed and internationally conducted and recognized scientific studies

dedicated to this issue, let alone when it comes specifically to the application of AIED-related methods and techniques in the ECCM. However, some relevant connected studies have pointed out that "the advent of large language models (LLMs), demonstrated by widely accessible chatbots, has generated significant interest in their potential application for communicating complex scientific knowledge" (Al Khourdajie, 2025, p. 7). In the similar vein, in spite of entirely understandable criticism regarding the lack of structured guiding on the use of AI for educators (Lane, 2025), some authors insisted on the fact that the use of AI in education could bring about a more equitable, creative and effective learning environment (Tarlan & Gerstlberger, 2025). On the other hand, a recent study explored numerous potential risks associated with the use of AI in higher education, stressing the issues of the validity of data, academic integrity and privacy risks (Pikhart & Al-Obaydi, 2025). The phenomenon of AI-based teaching and learning is still relatively new, while the application of AIED in education on environmental issues – especially on climate change and its mitigation – has not yet gained sufficient progress to allow stable and undisputable findings, let alone more universally applicable and verifiable scientific conclusions.

Results and discussion

The surveys were carried out on the basis of two separate – but intrinsically interconnected and complementary – questionnaires. Q1 was addressed to 14 researchers who had already achieved significant results in the field (selection criteria were explained in the section dedicated to the methodology), and was designed to establish the main aspects of the existing studies of AIED applicable to education on climate change mitigation. The responsiveness of the surveyed researchers can be assessed as satisfactory, given that 12 out of 14 researchers sent their responses with filled-in questionnaires – 85.7% of total number of Q1 sent. One of the main reasons for such responsiveness was, most probably, the personal involvement of the researchers and their wish to engage in scientific study and debate, as well as to disseminate the results of their research; on the other hand, maybe it was the simple fact that, according to some of them, "AI's role in education has swiftly advanced from automating routine administrative tasks to facilitating highly personalized and adaptive learning experience" (Tarlan & Gerstlberger, 2025).

Q2 was sent to 52 selected educational institutions worldwide and was focused on the recent and most relevant impacts of AI in education and awareness-raising on climate change mitigation. In order to ensure higher responsiveness, Q2 was most often sent to selected persons within educational institutions (professors, heads of departments, persons responsible for curricular development etc.). The responsiveness of the surveyed educational institutions can be assessed as moderate to low (27 out of 52) – 51.9% of total number of Q1 sent.

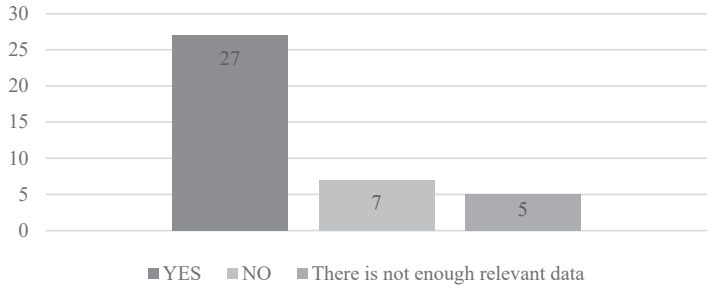
Geographical distribution of surveyed individuals and institutions was intended to be global, covering equally all continents. However, the response of European entities was disproportionally higher (34% of sent and 61% of received answers), most probably due to varying periods of academic vacation, as well as proximity and/or common fields of interests with the surveyor.

Q1 and Q2 were designed in a way that allows to display both common (some identical or similar questions) and specific standpoints of researchers and educators/representatives of educational institutions. This approach allowed the differentiation of general and specific results, as well as and further extrapolation the use of descriptive and inferential statistical methods to process the gathered data. Some of the inquiries, even if formulated in a similar or identical ways in both questionnaires (for example, Q1 – question 6 and 7 and Q2 – questions 8 and 9; Q1 – question 12 and Q2 – question 10) were introduced as a corrective variable.

General results of the surveys (both Q1 and Q2) can be classified in three major topics:

1. Overall aptitude of AI-based tools to significantly improve education, learning and teaching methods;
2. Actual use of AI to improve the education on climate change mitigation and its impact;
3. Future potential of AI-based tools to significantly contribute to education and/or awareness-raising on climate change mitigation, adaptation, impact reduction and early warning.

Figure 1
Overall attitude on AI in education



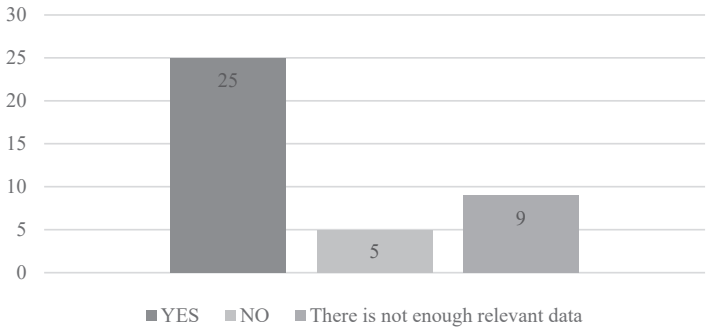
Note. Answers to the question "Can AI, in general, significantly improve education, learning and teaching methods"?

While it is not surprising that, to a question formulated in general (and, to some extent, deliberately imprecise) terms, the majority (72%) of surveyed entities responded positively, it is important to note that 13% of researchers and educators still consider that there is not relevant data regarding the potential of AI to represent a game changer in education (Figure 1).

The survey shows a significant discrepancy between (although quite general) trust that AI could improve education (67%), on the one hand, and the absence of its use in education on climate change mitigation (59%), on the other, with a significant share (33%) of those who declared that there is not relevant data. Such results confirm the findings of some previous researches defining AI in education more as a pedagogical opportunity, than a technocratic

threat (Chatzichristofis, 2026), without entirely discrediting more critical views insisting on multifaceted risks (Pikhart & Al-Obaydi, 2025). However, out of the small proportion (7.7% - 3 out of 39) of those who consider that AI is presently used to improve education on climate change, everyone estimated that it was significant for the improvement of the quality of the education on climate change mitigation to be positively impacted by AI-based tools.

Figure 2
Potential of AI-based tools in education on climate change mitigation



Note. Answers to the question "Do you believe that AI-based tools will, in the foreseeable future, significantly contribute to education and/or awareness-raising on climate change mitigation, adaptation, impact reduction and early warning?"

Even if very few researchers and educators estimated that AI tools are actively used in education on climate change mitigation, majority of them (64%, see Figure 2) believe those tools will, in the foreseeable future, give a significant contribution to education and/or awareness-raising on this particular issue. This shows that there is an important potential for future development of adapted, tailor-made, innovative and responsive AI-based tools, that would be able to rapidly respond to the pressing need to reach educational goals and contribute to awareness-raising on climate change.

Survey among the researchers was focused on the following three major specific issues:

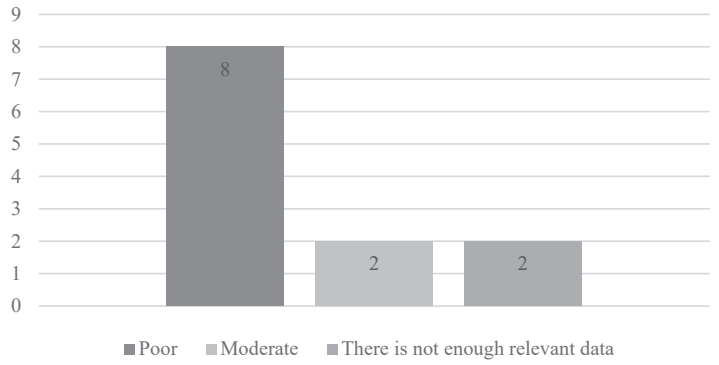
1. Number, scope, depth and frequency of modifications in curricula related to the use of AI tools in education on climate change mitigation;
2. Level of interoperability of AI-based educational tools on climate change mitigation in technical, natural (biology, chemistry) and social sciences (political science, law, environmental studies) in the existing higher education curricula;
3. Number and scope of proposed, adopted and/or implemented national and supra-national regulatory changes intended to improve the achievement of SDG target 13.3.

It should be noted that, even if they estimate that AI is rarely used to improve education on climate change mitigation, researchers believe there are some modifications in

curricula in this direction; while the number and scope of these modifications remain low, when they occur, their frequency and, even more, depth and not negligible.

The majority of researchers estimated that the level of interoperability of AI-based educational tools on climate change mitigation is moderate (42%) or significant (17%). If correlated with, on the one hand, their assessment regarding the depth and frequency of curriculum changes in this field, and, on the other, the time needed to fully implement them (Smeed et al., 2015) and allow "cognitive restructuring" (Fauziah & Setyowati, 2019), it can be concluded that AI-based educational tools can contribute to a significant complementarity and convergence of curricula dedicated to climate change in technical, natural and social sciences, leading to a more equitable, creative and effective learning environment (Tarlan & Gerstlberger, 2025). In conclusion, when consistently implemented in higher number of curricula, an improved AI-assisted environment could significantly contribute to the positive impact of AIED on the achievement of SDG target 13.3.

Figure 3
Evaluation of regulatory changes



Note. Answers to the question "How would you evaluate the number and scope of proposed, adopted and/or implemented national and supra-national regulatory changes intended to improve the achievement of SDG target 13.3?"

Finally, in a question exclusively dedicated to them (see Figure 3), the researchers were asked to give their estimation regarding national and supra-national regulatory changes aiming to improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning (SDG target 13.3). As one of the rare queries in Q1 not directly related to AI issues, it served both as a control variable and as a way to compare results in curricular and regulatory changes. It is important to note that only a relatively small proportion of surveyed persons are experts in legal or political sciences, but – unlike it was the case of their answers to other questions – none of them invoked the absence of relevant data, possibly due to the fact

that educators tend to believe that teacher agency can direct AI (Chatzichristofis, 2026). Participants' responses to this question revealed an important finding: researchers often consider themselves better informed about what is done on national and supra-national regulatory level than about what is done in the milieu of education.

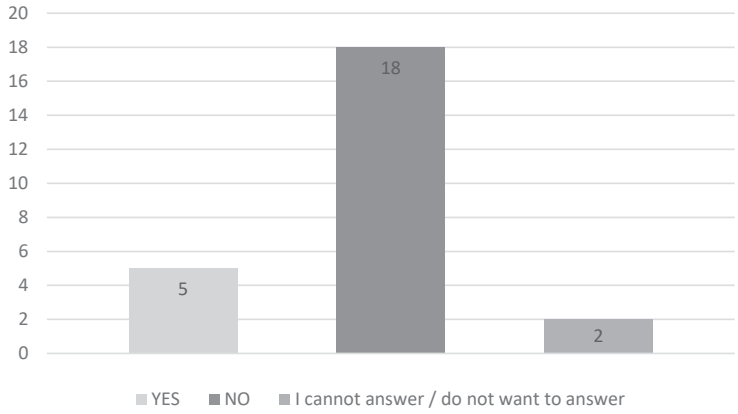
Survey among the educators/representatives of educational institutions was focused on the following three major specific issues:

1. Use of AI-based tools in educational and/or research activities;
2. Presence of AI-related issues in curricula and/or institutional educational/research objectives;
3. Number and scope of modifications in curricula related to the use of AI tools in education.

The use of AI in educational and/or research activities is still not widespread (33%) in educational institutions, both on graduate and under-graduate level. It is, however, interesting to note that – even within their own institution – educators are often unaware (15%) of whether their colleagues in other departments/units are using some AI-based tools, and even less when it comes to the ways of this use. This shows that AI – at least on the global level – is still a novelty in educational milieu, as it has already been mentioned in the literature, particularly when it comes to the structured guidance for educators (Lane, 2024).

Figure 4

Presence of AI-related issues in the curricula



Note. Answers to the question "Are AI-related issues present in your curricula and/or your institutional educational/research objectives"?

The results were even more striking when educators had been asked about the presence of AI-related issues in curricula and/or institutional educational/research objectives of their institution (see Figure 4). The overwhelming majority (74%) responded negatively, while those who stated that AI has – in a transparent and formally established way – its place in their curricula and/or among their institutional educational/research objectives were, most probably, professors who, themselves, designed those curricula and are presently teaching according to the curricula.

While they are almost as pessimistic as researchers when it comes to the number of modifications in curricula related to the use of AI tools in education, teachers' answers are outstandingly different regarding the scope of these modifications, with 55% of them estimating they are significant (42%) or moderate (13%). This leads to, most probably, the crucial insight of this part of the survey: once we undertake the curriculum changes related to the use of AI tools in education on climate change, their scope is most often significant, which is a finding confirmed by a recent systemic literature review (Tarlan & Gerstlberger, 2025). When put in correlation with what has already been alleged above, it can be concluded that AI-based educational tools have a significant potential to contribute to the achievement of SDG target 13.3.

Conclusions and projections

Based on combined and extrapolated findings from surveys and analyses of research on AI in education (AIED) and its role in climate change mitigation, several key conclusions and projections (*see Table 1*) have been drawn, with a focus on how different types of curricula align with the specific needs of education on climate mitigation (ECCM).

Table 1
How different types of curricula correspond to the specific needs of ECCM

Specific needs/ characterictics of ECCM	Traditional (non AI-assisted) curricula	General AI-assisted educational tools	AI-assisted educational tools adapted to ECCM (projection)
Cross-disciplinarity	Low to moderate - frequently insist on strict division between natural and social sciences - slow in adaptation to cross-disciplinary issues related to sustainability	Moderate - more often integrate cross-cutting issues - often include interactive educational tools	Moderate to high - able to illustrate the complexity of sustainability related issues - always include interactive educational tools
High global socio-economic stakes	Weak adaptability - mostly slow and inefficient in combatting prejudices, misbelieves and conspiracy theories about climate change - irresponsive to new channels of information and communication	Adaptable, with high risks - adaptable to quick societal changes and rapidly changing environment - can easily be used for deceptive and manipulative purposes	Highly adaptable - capable to present the societal impacts of climate change - efficient in combatting prejudices, misbelieves and conspiracy theories - responsive to new channels of information and communication
Exigency to reach educational goals	Mainly slow - most often designed to reach complex educational goals - focused on long-lasting pedagogic objectives	Potentially rapid, with risks - can deliver rapid outcomes, with questionable sustainability - can be subject to manipulation	Rapid - capable to provide concise and tailor-made training - efficient in raising consciousness and encouraging environmental activism

AI-based tools can significantly improve education, learning, and teaching on climate change mitigation, yet they are still relatively rarely used. Modifications in curricula related to the use of AIED tools in ECCM remain limited in number and scope; however, their increasing depth and frequency suggest a likely expansion of AI-based tools and practices in ECCM curricula. At the same time, proposed and implemented national and supra-national regulatory changes aimed at achieving SDG target 13.3 remain insufficient; the delayed adoption of the European Union's Artificial Intelligence Act (Regulation EU 2024/1689), together with its limited scope, will most likely result in constrained effects and potential enforcement challenges across the EU Member States.

The interoperability of AI-based educational tools for climate change mitigation across natural sciences (such as biology and chemistry) and social sciences (including political science, law, and environmental studies) is expected to grow, thereby strengthening the sustainability of pedagogic objectives. Taking into account the specific needs and characteristics of ECCM – such as cross-disciplinarity and the high global socio-economic stakes involved in achieving educational goals – AI-assisted tools specifically adapted to ECCM are more likely to achieve pedagogic effectiveness than general AI-based tools. This is due to their ability to better represent the complexity of sustainability issues, address societal impacts of climate change, counter misinformation and misconceptions, and adapt to evolving communication channels. In addition, they are more efficient in delivering concise, tailored learning and more effective in raising awareness and fostering environmental engagement.

Overall, when evaluated in terms of their capacity to meet educational goals, traditional (non-AI-assisted) curricula tend to be slower due to their emphasis on long-term pedagogic outcomes. General AI-assisted tools can produce rapid educational results, though with uncertain sustainability, whereas ECCM-adapted AI tools, despite certain structural risks, are better suited to provide targeted, efficient, and impactful learning, while also enhancing cross-disciplinarity and adaptability to complex global socio-economic contexts.

References

Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production, 437*. https://doi.org/10.1016/j.jclepro.2023.140527

Alfayez, A. A., & Rasool, A. (2025). Use of AI in the Curriculum Development of Transnational Higher Education. In F. Naseer, C. Yu, R. Dulloo, M. Abdul Kader Jilani, & M. Shaheen (Eds.), *Bridging Global Divides for Transnational Higher Education in the AI Era* (pp. 401-422). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-7016-2.ch019

Allam, H. M., Gyamfi, B., & AlOmar, B. (2025). Sustainable Innovation: Harnessing AI and Living Intelligence to Transform Higher Education. *Education Sciences, 15*(4), 398. https://doi.org/10.3390/educsci15040398

Al Khourdajie, A. (2025). The role of artificial intelligence in climate change scientific assessments. *PLOS Climate, 4*(9), 1-14. https://doi.org/10.1371/journal.pclm.0000706

Arora-Jonsson, S. (2023). The sustainable development goals: A universalist promise for the future. *Futures, 146*. https://doi.org/10.1016/j.futures.2022.103087

Berliner, D. C. (2009). MCLB (Much Curriculum Left Behind): A U.S. Calamity in the Making. *The Educational Forum, 73*(4), 284-296. https://doi.org/10.1080/00131720903166788

Ćemalović, U. (2020). Creativity and ownership: Protection of rights in musical works in the European Union from digitisation to artificial intelligence. *Musicology,* 29, 149-162. https://doi.org/10.2298/MUZ2029149C

Chatzichristofis, S. A. (2026). Reframing AI in Education: A Pedagogical Opportunity, Not a Technocratic Threat. *Journal of Research in Science Teaching, 63(*1), 97-103. https://doi.org/10.1002/tea.70024

Correia A. & Água P. (2024). Harnessing artificial intelligence for enhanced environmental, social, and governance reporting: A new paradigm in corporate transparency. In Ž. Stankevičiūtė , A. Kostyuk , M. Venuti , & P. Ulrich (Eds.), *Corporate Governance: Research and Advanced Practices* (pp. 92-98). Virtus Interpress. https://doi.org/10.22495/cgrapp15

Council of Europe. (2022). *Artificial intelligence and education: A critical view through the lens of human rights, democracy and the rule of law* (W. Holmes, J. Persson, I. A. Chounta, B. Wasson, & V. Dimitrova (Eds.); https://www.developmentaid.org/api/frontend/cms/file/2022/11/Artificial-Intelligence-and-education_eng.pdf

Edam, S. M. (2024). AI in Educational Design and Technological Development. In Z. Ahmed, A. Hassan, & R. Saeed (Eds.), *AI-Enhanced Teaching Methods* (pp. 25-60). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-2728-9.ch002

Ehrenfeld, N. (2022). Framing an Ecological Perspective on Teacher Professional Development. *Educational Researcher, 51*(7), 489–495. https://doi.org/10.3102/0013189X221112113

England's school curriculum needs reform to fix "glaring omissions," review finds. (n.d.). Financial Times. https://www.ft.com/content/7b0fe220-32ed-43b3-8178-01751aa5730f

Fauziah, M., & Aprilia Setyowati, A. (2019). Cognitive restructuring techniques to improve student self-concept. *Advances in Social Science, Education and Humanities Research, 387* 3rd International Conference on Education Innovation (ICEI 2019).

Gupta, S., & Agarwal, S. (2025). Applications of machine learning and artificial intelligence in Environmental, Social and Governance (ESG) sector. *Proceedings of the 3rd International Conference on Optimization Techniques in the Field of Engineering (ICOFE-2024)*.

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education Research, Development and Policy, 57*(4), 542-570. https://doi.org/10.1111/ejed.12533

Holstein, K., & Doroudi, S. (2021). Equity and artificial intelligence in education: Will "AIEd" amplify or alleviate inequities in education? https://doi.org/10.48550/arXiv.2104.12920

International Association of Privacy Professionals. (2024). *Global AI law and policy tracker*. https://iapp.org/media/pdf/resource_center/global_ai_law_policy_tracker.pdf

Lane, R. (2025). Mitigating risks, embracing potential: a framework for integrating generative artificial intelligence in geographical and environmental education. *International Research in Geographical and Environmental Education*, 1-18. https://doi.org/10.1080/10382046.2025.2458561

Leal Filho, W., Kim, E., Borsatto et al. (2025). Using artificial intelligence in sustainability teaching and learning. *Environmental Sciences Europe, 37*, 124. https://doi.org/10.1186/s12302-025-01159-w

Linderoth, C., Hultén, M., & Stenliden, L. (2024). Competing visions of artificial intelligence in education—A heuristic analysis on sociotechnical imaginaries and problematizations in policy guidelines. *Policy Futures in Education*, *22*(8), 1662-1678. https://doi.org/10.1177/14782103241228900

Lingard, B., & McGregor, G. (2013). High-stakes assessment and new curricula: A Queensland case of competing tensions in curriculum development. In M. Priestley & G. Biesta (Eds.), *Reinventing the curriculum: New trends in curriculum policy and practice* (pp. 207-228). Bloomsbury Academic.

OCR. (2024). *Striking the balance*. Cambridge University Press & Assessment. https://teach.ocr.org.uk/striking-the-balance

Ortagus, J. (2023). The relationship between varying levels of online enrolment and degree completion. *Educational Researcher, 52*(3), 170-173. https://doi.org/10.3102/0013189X221147522

Pasque, P. A., Bowman, N. A., & Martinez, M. (Eds.). (2009). *Critical issues in higher education for the public good: Qualitative, quantitative & historical research perspectives*. Kennesaw State University Press.

Pikhart, M. & Al-Obaydi L. (2025). Reporting the potential risk of using AI in higher Education: Subjective perspectives of educators*, Computers in Human Behavior Reports, 18*. https://doi.org/10.1016/j.chbr.2025.100693

Smeed, J., Bourke, T., Nickerson, J., & Corsbie, T. (2015). Testing Times for the Implementation of Curriculum Change: Analysis and Extension of a Curriculum Change Model: Analysis and Extension of a Curriculum Change Model. *Sage Open*, *5*(2), 1-14. https://doi.org/10.1177/2158244015581018

Swain, R. B. (2018). A critical analysis of the sustainable development goals. In W. L. Filho (Ed.), *Handbook of sustainability science and research* (pp. 341-355). Springer

Tapalova, O. & Zhiyenbayeva, N. (2022). Artificial Intelligence in education: AIEd for personalised learning pathways. *Electronic Journal of e-Learning 20*, 639-653. https://doi.org/10.34190/ejel.20.5.2597

Tarlan, A., & Gerstlberger, W. (2025). AI for ESG Education: Mapping Innovations, Challenges, and Future Directions. In *Artificial Intelligence*. IntechOpen. https://doi.org/10.5772/intechopen.1012985

United Nations. (2015). *The 17 goals*. https://sdgs.un.org/goals

United Nations. (2024). *Report of the Secretary-General: Progress towards the Sustainable Development Goals* (submitted on May 2, 2024). https://unstats.un.org/sdgs/files/report/2024/SG-SDG-Progress-Report-2024-advanced-unedited-version.pdf

Yuan, X., Bennett Gayle, D., Knight, T., & Dubois, E. (2023). Adoption of artificial intelligence technologies by often marginalized populations. In X. Yuan, D. Wu, & D. Bennett Gayle (Eds.), *Social vulnerability to COVID-19* (Synthesis Lectures on Information Concepts, Retrieval, and Services) (pp. 31-49). Springer. https://doi.org/10.1007/978-3-031-06897-3_3

Yuskovykh-Zhukovska, V., Poplavska, T., Diachenko, O., Mishenina, T., Topolnyk, Y., & Gurevych, R. (2022). Application of artificial intelligence in education: Problems and opportunities for sustainable development. *BRAIN: Broad Research in Artificial Intelligence and Neuroscience, 13*(1 Suppl. 1), 339-356. https://brain.edusoft.ro/index.php/brain/article/view/1272

Zawacki-Richter, O., Marín, V.I., Bond, M. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators?. *Int Journal of Educational Technology in Higher Education, 16*(39). 1-27. https://doi.org/10.1186/s41239-019-0171-0

Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., Liu, J.-B., Yuan, J., & Li, Y. (2021). A review of artificial intelligence (AI) in education from 2010 to 2020. *Complexity, 2021*(1). 1-18. https://doi.org/10.1155/2021/8812542

Article received: 16.12.2025.
Updated version received: 08.06.2026.
Accepted for publishing: 11.06.2026.

Uroš Ćemalović
Institute of European Studies, Belgrade, Serbia
https://orcid.org/0000-0002-0760-9703



This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Studies in Teaching and Education, 2026, *75*(2), 437-455
https://doi.org/10.5937/niv75-62646

ISSN 0547-3330
eISSN 2560-3051
Original research paper

Personal and School-Related Characteristics as Predictors of Teacher Burnout in Serbia

Stanislava Marić Jurišin
Department of Pedagogy, Faculty of Philosophy,
University of Novi Sad, Novi Sad, Serbia
Borka Malčić
Department of Pedagogy, Faculty of Philosophy,
University of Novi Sad, Novi Sad, Serbia
Snežana Jokić
Technical Faculty, University of Novi Sad, Zrenjanin, Serbia
Simona Bekić[1]
Department of Pedagogy, Faculty of Philosophy,
University of Novi Sad, Novi Sad, Serbia

Abstract *Studies of teacher burnout indicate a concerningly high proportion of professionals exhibiting its symptoms worldwide. The consequences of this phenomenon go beyond the individual level, as they undermine the quality of the teaching process, reduce teachers' motivation and psychological well-being, and may negatively affect students' development. Thus, the following study aimed to examine how personal and workplace-related factors contribute to the development of teacher burnout in Serbia. A cross-sectional survey was conducted with a sample of 883 primary and secondary school teachers across Serbia, using the Maslach Burnout Inventory – Educators Survey (MBI-ES) and a set of personal and workplace-related variables. The results revealed moderately high levels of Emotional Exhaustion, low to moderate levels of Depersonalization, and high levels of Personal Accomplishment. Multiple regression analyses identified significant predictors of burnout dimensions: seniority, material status, age, school type, and field of study for Emotional Exhaustion; field of study for Personal Accomplishment; and seniority, age, and material status for Depersonalization. These findings highlight that burnout is shaped not only by individual factors but also by broader organizational and systemic conditions. The findings from this study may help create burnout prevention strategies in Serbia, as well as comparable educational contexts. Limitations and directions for future research are also discussed in this paper.*

Keywords: *teachers, teacher burnout, school environment, MBI-ES.*

1 simona.bekic@ff.uns.ac.rs

Introduction

Burnout syndrome is usually defined a state of emotional exhaustion and a reduced sense of personal accomplishment, which arises as a response to long-term stress associated with an individual's workplace (Schaufeli & Buunk, 2003). Although it has many conceptualizations, it is usually determined by three dimensions: emotional exhaustion (EE), depersonalization or detachment from one's job and people involved in it (DP) and a sense of reduced personal accomplishment (PA) (Maslach et al., 2016). Various sociological, economic, political and environmental factors have contributed to the increasing prevalence of the burnout syndrome in the 21st century. Research has shown that the causes and symptoms of burnout syndrome are similar across different professional contexts (Marek et al., 2017; Schaufeli et al., 2009), however, studies indicate that burnout is more prevalent in professions involving human services, such as health care and education (Durr et al., 2014).

In Serbia, the results so far show concerningly high levels of burnout among teachers (Marić i sar., 2024; Ranđelović i sar., 2013). Teachers are especially prone to it due to the nature of their work, which involves high emotional demands, work under pressure and often inadequate working conditions (Marić-Jurišin i Malčić, 2022; Popović i sar., 2023). The importance of examining this phenomenon is of global interest and is reflected in its numerous negative factors: health concerns, educational process disruption, interference with the mental and emotional development of children (Marić i sar., 2024; Ranđelović i sar., 2013), lowering teachers' self-efficacy, work motivation, self-esteem, self-respect, productivity and job satisfaction (Herman et al., 2018; Marek et al., 2017; Skaalvik & Skaalvik, 2014)). Numerous psychological and educational studies have dealt with teacher burnout (Buonomo et. al., 2017; Chang, 2013; Kim & Burić, 2020; Ranđelović i sar., 2013). However, few studies have explored the effect of complex interplay between individual characteristics and the work environment on teacher burnout. Thus, the goal of this research is to analyse the relationships of teachers' personal and work characteristics and the way in which they explain teacher burnout syndrome in Serbia. Findings can inform not only school-level interventions but also broader educational policy in Serbia and similar contexts.

Predictors of teacher burnout

Although people from all professions are prone to developing burnout, this condition is very common among teachers. It has been speculated that burnout affects 70% of teachers over the course of their professional lives (Piperac et al., 2021). These concerning numbers raise the question of why this occurs. The existing literature highlights the multifaceted nature of teacher burnout, which can generally be explained through personal and workplace-related predictors.

Among personal characteristics, age is often identified as an important factor, although findings remain inconsistent. Some studies suggest that burnout is more common among younger teachers (Al Asadi et al., 2018; Zhang, 2022), while others report higher

levels among older teachers (Aflakseir & Nemati, 2018; Padmanabhanunni & Pretorius, 2023; Schaufeli & Buunk, 2003). Similar inconsistencies appear when perceiving gender as a potential factor. Some studies found higher burnout among female teachers (Zhang et al., 2014), while others reported greater prevalence among male teachers (Al Asadi et al., 2018; Unterbrink et al., 2007). In Finnish research, men showed higher depersonalization, whereas women reported higher emotional exhaustion (Saloviita & Pakarinen, 2021). A meta-analysis by Yorulmaz and Altınkurt (Yorulmaz & Altınkurt, 2018) indicates that educational status is another contributing factor to teacher burnout. Teachers with higher academic degrees reported greater burnout and lower personal accomplishment (Yorulmaz & Altınkurt, 2018). Seniority has also been linked to burnout, although results differ, with some studies showing higher burnout among more experienced teachers (Yorulmaz & Altınkurt, 2018), while others report the opposite (Al Asadi et al., 2018). Lower material status has also been associated with higher burnout levels (Candeias et al., 2020). These mixed findings may partly reflect differences in cultural and educational contexts, which are often insufficiently considered in quantitative studies.

When it comes to workplace-related characteristics, studies have identified differences across educational stages. While some found no significant differences between primary and secondary school teachers (Rajendran et al., 2020), others reported that teachers working in lower educational stages were more prone to burnout across all dimensions (Kimsesiz, 2019). Differences have also been observed between school types. For example, teachers in vocational schools, such as German Hauptschulen, showed higher burnout rates than those in grammar schools, partly due to feeling less rewarded and having lower professional status (Unterbrink et al., 2007). As well as this, some authors have found opposing differences between levels of burnout between teachers' fields of study (e.g. humanities versus STEM teachers) (Agyapong et al., 2022; Saloviita & Pakarinen, 2021).

Research aim and hypothesis

The goal of this research is to determine and analyse the complex relationships of personal and workplace characteristics of teachers, as well as the way in which they explain teacher burnout syndrome in Serbia. Hypotheses were formulated based on the reviewed literature and the characteristics of the study context. The main hypothesis (H_0) reads: There is no significant relationship between personal and work characteristics with the level of burnout of teachers. The alternative main hypothesis (H_1) is that there is a significant association between personal characteristics and work context with teachers' burnout levels. The specific research hypotheses are:

H1: Teachers with longer working experience have a higher level of burnout.

H2: Teachers with a worse financial status have a higher level of burnout.

H3: Older teachers have a lower level of burnout compared to younger ones.

H4: There are differences in burnout levels between teachers at different school types.

H4.1: Teachers working in primary schools have a higher level of burnout compared to those in secondary schools.

H4.2: Teachers working in the first-cycle of primary schools have higher burnout levels compared to second-cycle primary school teachers.

H5: Teachers of social, artistic and practical subjects have a lower level of burnout compared to teachers of subjects in the field of natural sciences.

H6: The function of homeroom teacher is associated with a higher level of burnout.

H7: Gender and level of education are not significant predictors of burnout.

Methods

Study Context

The study is based in Serbia, where basic education is organized as a single eight-year structure consisting of two educational cycles: the first cycle (Grades 1 – 4), taught by classroom teachers, and the second cycle (Grades 5 – 8), based on subject teaching, with different teachers for individual subjects. Public primary education is compulsory and free of charge (Eurydice, 2025), after which students may continue into four-year general grammar schools or vocational secondary education. Initial teacher education pathways differ depending on the teaching role. Classroom teachers are educated at faculties of education through programs focused on pedagogy, didactics, and practice, usually completing a four-year Bachelor of Education followed by a one-year master's program. Subject teachers, who teach in higher primary grades and secondary schools, are educated primarily within discipline-specific faculties and later complete pedagogical, psychological, and didactical training. Since 2013, an alternative pathway has allowed graduates from non-teaching fields to obtain a master's degree in education and enter the profession (Maghnouj et al., 2020). Although all teachers are formally required to hold a master's degree, the variable "educational level" in this study reflects differences in attained academic degrees and educational trajectories rather than formal eligibility.

These differences in teacher preparation may shape distinct professional experiences, as classroom teachers are more strongly oriented toward holistic child development and long-term relationships with pupils, while subject teachers focus more on disciplinary knowledge and subject-specific instruction (Maghnouj et al., 2020). At the same time, the Serbian education system faces several structural challenges. Public investment in education has remained relatively low, around 4% of GDP, below the OECD average, with underfunding especially visible in secondary education (Maghnouj et al., 2020). The teaching workforce is aging, predominantly female, and often characterized by traditional pedagogical practices that lay behind student-centred approaches. Teacher salaries remain relatively low, while career advancement mechanisms are limited by complex promotion procedures and weak financial incentives. Professional development is mainly funded on a local level and often depends on external resources or teachers' own contributions, due to unstable central funding and limited municipal budgets (Eurydice, 2025; Maghnouj et al., 2020).

Sample

The sample structure is presented in Table 1. During the implementation of the research, the authors adhered to the provisions of the Code of Academic Integrity of the University of Novi Sad, especially Article 7, which referred to "scientific and research work with respondents" (University of Novi Sad, 2020, p. 3). Additionally, participants were informed about the ethical procedures, and they participated in the research voluntarily.

Table 1
Sample of the study (N = 883)

Variable	Level	Counts	Percent
Gender	Male	132	14.9
	Female	751	85.1
Age group	24-30	55	6.2
	31-40	183	20.7
	41-50	320	36.2
	51-60	264	29.9
	61+	61	6.9
Seniority	1-5	91	10.3
	6-15	219	24.8
	16-25	304	34.4
	25+	269	30.5
Education level	Bachelor studies	405	45.9
	Master studies	442	50.1
	Specialist studies	26	2.9
	Doctoral studies	10	1.1
Economic status	Same as the majority	588	66.6
	Worse than the majority	234	26.5
	Better than the majority	61	6.9
School setting	Urban	568	64.3
	Rural	315	35.7
School type	Primary school – first cycle	246	27.9
	Primary school – second cycle	375	42.5
	Secondary vocational school	164	18.6
	Secondary grammar school	77	8.7
	Secondary art school	21	2.4

Instruments

The first part of the instrument included questions about respondents' personal characteristics and work context, such as gender, age, seniority (number of years spent teaching), education level (having completed bachelor, master, specialist or doctoral studies), school setting (urban/rural), school type, field of study (subject area), homeroom teacher status, material status, and participation in professional development activities. In Serbia, educational professionals are legally entitled and required to engage annually in diverse forms of professional development (Ministarstvo prosvete, nauke i tehnološkog razvoja, 2021). In the survey, participation in professional development activities was operationalized through self-reported frequency on an annual basis (ranging from no participation to frequent participation). The second part of the instrument consisted of the Maslach Burnout Inventory – Educators Survey (MBI-ES; Maslach & Jackson, 1981), which assesses teacher burnout. The MBI-ES contains 22 items measuring three dimensions of burnout (emotional exhaustion – EE, personal accomplishment – PA, and depersonalization – DP), rated on a 7-point Likert scale (0 = never to 6 = every day). The scale demonstrated good internal consistency in this study, with Cronbach's alpha coefficients above .70 for all subscales.

Procedure and data analysis plan

The study employed a cross-sectional, survey-based design, using a convenience sampling approach. The data were collected during June and July 2024, via an online questionnaire administered through Google Forms. The survey link was distributed through official school email lists and professional networks on social media. Participation was voluntary and anonymous, and all participants provided informed consent prior to completing the questionnaire. Only fully completed responses were included in the analysis.

Descriptive statistics were calculated for all study variables. Pearson's correlation coefficients were computed to examine associations between burnout subscales and socio-demographic and workplace-related variables. Multiple linear regression analyses were conducted to identify predictors of each of the three burnout dimensions. Assumptions of normality, linearity, homoscedasticity, and absence of multicollinearity were checked prior to regression analyses. In order to examine differences between primary school teachers of the first cycle (class teachers) and teachers of the second cycle (subject teachers), additional analyses were conducted on a subsample of teachers employed in primary schools using the *t*-test and chi-square test of independence. All statistical analyses were performed using IBM SPSS Statistics 26.

Results

Descriptive statistics

Based on the classification of results from the MBI manual (Maslach et al., 2016), our descriptive statistics (Table 2) indicate moderately high levels of EE, low to moderate levels of DP, and high levels of PA.

Table 2
Descriptive Statistics of Teacher Burnout Subscales (N=883)

Subscale	Range	*M*	*SD*	Variance
Emotional exhaustion	0-60	3.29	1.82	3.31
Personal accomplishment	8-39	4.41	1.36	1.88
Depersonalization	0-22	1.43	1.56	2.50

Note. N stands for number of participants, *M* stands for mean; *SD* stands for standard deviation

Approximately 60% of teachers in the sample reported experiencing chronic EE. The variability of scores indicates that, although the average EE levels are moderately high, there is a substantial subgroup of teachers experiencing very high levels of exhaustion. Participants reported, on average, low levels of DP. However, a concerning trend was observed in item DP11 – "I worry that this job is hardening me emotionally" ($M = 3.29$), suggesting that some teachers are concerned about becoming emotionally detached from their work and students. The observed variability indicates that certain subgroups may be at higher risk, and warrant further attention and targeted support. Regarding PA, teachers reported consistently high levels, indicating a strong sense of professional competence and achievement. High PA scores suggest that, despite the presence of EE in the sample, a significant protective factor exists in the form of high professional efficacy and personal fulfilment.

Associations Between Socio-demographic and Work-Related Characteristics and Burnout Dimensions

Pearson's correlation coefficients were calculated to examine associations between socio-demographic and workplace-related variables (Items 1–10) and the three subscales of burnout measured by the MBI-ES (Table 3). The aim of this analysis was to identify potential risk and protective factors for teacher burnout, as well as to highlight teacher subgroups potentially more vulnerable to burnout. The burnout subscales were significantly interrelated in the expected theoretical directions, consistent with the multidimensional structure of burnout proposed in the literature (Maslach et al., 2016).

A significant negative correlation was found between material status, school type, seniority, age and gender with EE. No significant correlations were observed between EE and field of study or homeroom teacher status. Regarding DP, correlations were found with homeroom teacher status, participation in professional development, and material status. No significant associations were found between DP and age, gender, seniority, education level, or field of study. The subscale PA was shown to be correlated with homeroom teacher status, field of study, and school type. No significant correlations of PA were found with gender, age, seniority, material status or education level of teachers.

Table 3
Correlations of socio-demographic and work-related characteristics and teacher burnout subscales

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Gender	1												
2. Age	.088**	1											
3. Seniority	.115**	.832**	1										
4. Education level	-.067*	-.242**	-.226**	1									
5. Material status	-.022	-.115**	-.066*	.098**	1								
6. School setting	-.013	.063	.058	-.056	-.007	1							
7. Professional development	.019	.009	-.013	-.041	-.007	-.015	1						
8. School type	-.182**	-.063	-.088**	.131**	.080*	.076*	.019	1					
9. Homeroom teacher status	.173**	.099**	.147**	-.088**	-.046	.023	.000	-.654**	1				
10. Field of study	.061	.088*	.100**	-.023	-.026	.063	.034	-.473**	.920**	1			
11. EE	.073*	.061	.135**	-.043	-.196**	.025	-.018	-.069*	.007	-.041	1		
12. PA	.020	.018	.039	-.003	.029	.008	.026	-.118**	.189**	.148**	-.326**	1	
13. DP	-.014	-.014	.035	.016	-.087**	.014	-.066*	.031	-.074*	-.046	.606**	-.459**	1

Note. ** - Correlation is significant at the .01 level, * - Correlation is significant at the .05 level,
EE – emotional exhaustion, *PA* – personal accomplishment, *DP* – depersonalization.

Multiple linear regression

To examine how gender, age, seniority, education level, material status, school setting, school type, homeroom teacher status, professional development programs, and teachers' field of study predict teacher burnout, a multiple linear regression analysis was conducted.

Emotional exhaustion

An analysis of variance indicated that the overall regression model predicting EE was statistically significant, $F(10, 721) = 6.86$, $p < .001$ (see Table 4). The predictors jointly explained approximately 8.7% of the variance in EE ($R^2 = .09$, Adjusted $R^2 = .07$), which, although modest, is meaningful when investigating complex psychological constructs such as burnout. The standard error of the estimate was 12.40.

Table 4
ANOVA Summary for the Regression Model Predicting Emotional Exhaustion

Model		*SS*	*df*	*MS*	*F*	*Sig.*
1	Regression	10545.60	10	1054.56	6.86	.000
	Residual	110826.31	721	153.71		
	Total	121371.92	731			

Note. *SS* stands for Sum of Squares, df stands for degrees of freedom, *MS* stands for Mean Square, *F* stands for *F*-ratio, *Sig*. stands for *p*-value

The regression analysis (Table 5) revealed several significant predictors of EE. Seniority emerged as the strongest positive predictor and an increase in seniority raised EE scores by nearly 4 points on average. Age had a significant negative association with EE, lowering EE scores by an average of 2.4 points. Field of study also significantly predicted EE, with teachers of social, practical, and art subjects reporting lower EE compared to those teaching science-related subjects. Material status was negatively associated with EE indicating that teachers with better financial status experienced lower EE. School type was a significant predictor, with teachers in high schools reporting lower EE compared to their peers in primary schools. Additionally, homeroom teacher status showed a borderline significant effect, suggesting a possible trend toward elevated EE among homeroom teachers. However, this finding did not reach conventional significance levels and requires further investigation. Variables such as gender, school setting, education level, and participation in professional development programs did not significantly predict EE in this model.

Table 5
Regression Coefficients Predicting Emotional Exhaustion

Predictor	*B* (Unstandardized)	*SE B*	*β*	*t*	*p*
(Constant)	34.45	4.17	—	8.27	.00
Gender	.96	1.26	.03	.76	.45
Age	-2.43	.81	-.19	-2.98	.00
Seniority	3.99	.85	.30	4.71	.00
Education level	.34	.78	.02	.44	.66
Material status	-4.43	.87	-.18	-5.07	.00
School setting	1.20	.98	.04	1.22	.22
Professional development	-.01	.56	-.00	-.02	.98
School type	-1.24	.50	-.10	-2.50	.01
Homeroom teacher status	.91	.47	.18	1.92	.05
Field of study	-1.40	.47	-.28	-3.01	.00

Note. *B* stands for Unstandardized Coefficient, *SE B* stands for Standard Error for *B*, *β* stands for Standardized Coefficient, *t* stands for *t*-statistic, *p* stands for *p*-value

Personal accomplishment

An analysis of variance indicated that the overall regression model predicting PA was statistically significant, $F(10, 721) = 2.44$, $p = .007$ (see Table 6). The predictors jointly explained approximately 3.3% of the variance in PA ($R^2 = .03$, Adjusted $R^2 = .02$). Although modest, this result is relevant when investigating complex human behaviours such as burnout. The standard error of the estimate was 6.96.

Table 6
ANOVA Summary for the Regression Model Predicting Personal accomplishment

Model		*SS*	*df*	*MS*	*F*	*Sig.*
1	Regression	1181.49	10	118.15	2.44	.007
	Residual	34917.03	721	48.43		
	Total	36098.52	731			

Note. SS stands for Sum of Squares, *df* stands for degrees of freedom, *MS* stands for Mean Square, *F* stands for *F*-ratio, *Sig*. stands for *p*-value

The regression analysis (Table 7) revealed that field of study was the strongest positive predictor of PA, indicating that teachers of social studies, arts, and practical subjects reported significantly higher levels of PA compared to science teachers. Homeroom teacher status showed a marginally significant negative association with PA, suggesting a possible trend toward slightly lower PA among homeroom teachers, though this did not reach conventional significance thresholds. Similarly, material status showed a marginal positive association with PA, implying that teachers with better financial status may experience slightly higher levels of PA. Other variables – school type, seniority, age, gender, school setting, education level, and participation in professional development – did not significantly predict levels of PA in this model.

Table 7
Regression Coefficients Predicting Personal Accomplishment

Predictor	*B* (Unstandardized)	*SE B*	*β*	*t*	*p*
(Constant)	30.63	2.34	—	13.09	.00
Gender	.52	.71	.030	.74	.46
Age	-.06	.46	-.01	-.13	.89
Seniority	-.15	.48	-.02	-.32	.75
Education level	.20	.44	.02	.47	.64
Material status	.81	.49	.06	1.66	.09
School setting	.09	.55	.01	.16	.87
Professional development	.18	.32	.02	.57	.57
School type	.07	.28	.01	.25	.80
Homeroom teacher status	-.44	.26	-.16	-1.68	.09
Field of study	.84	.26	.30	3.19	.00

Note. B stands for Unstandardized Coefficient, *SE B* stands for Standard Error for *B*, *β* stands for Standardized Coefficient, *t* stands for *t*-statistic, *p* stands for *p*-value

Depersonalization

An analysis of variance indicated that the overall regression model predicting DP was statistically significant, $F(10.721) = 2.09$, $p = .02$ (see Table 8). The model explained approximately 2.8% of the variance in DP ($R^2 = .03$, Adjusted $R^2 = .01$). Although this is a small proportion of explained variance, the findings may still help identify risk groups rather than provide precise predictions of individual DP levels. The standard error of the estimate was 4.97.

Table 8
ANOVA Summary for the Regression Model Predicting Depersonalization

Model		*SS*	*df*	*MS*	*F*	*Sig.*
	Regression	515.180	10	51.518	2.09	.02
1	Residual	17808.683	721	24.700		
	Total	18323.863	731			

Note. *SS* stands for Sum of Squares, *df* stands for degrees of freedom, *MS* stands for Mean Square, *F* stands for *F*-ratio, Sig. stands for *p*-value

The regression analysis (Table 9) identified three significant predictors of DP. Seniority was the strongest positive predictor, indicating that teachers with more years of experience were more likely to report higher levels of DP. Age had a significant negative association with DP, which means that older teachers were less prone to DP. Material status also emerged as a significant negative predictor, suggesting that teachers with better financial standing reported lower DP levels. Other variables – gender, school setting, education level, professional development, school type, homeroom teacher status, and field of study – did not significantly predict DP in this model.

Table 9
Regression Coefficients Predicting Depersonalization

Predictor	*B* (Unstandardized)	*SE B*	*β*	*t*	*p*
(Constant)	9.95	1.67	—	5.96	.00
Gender	-.43	.51	-.03	-.85	.39
Age	-.80	.33	-.16	-2.45	.01
Seniority	1.07	.34	.20	3.16	.00
Education level	.16	.31	.02	.51	.61
Material status	-.79	.35	-.08	-2.26	.02
School setting	.20	.39	.02	.51	.61
Professional development	-.31	.23	-.05	-1.39	.16
School type	-.16	.20	-.03	-.80	.42
Homeroom teacher status	.17	.19	.09	.91	.36
Field of study	-.29	.19	-.15	-1.56	.12

Note. *B* stands for Unstandardized Coefficient, *SE B* stands for Standard Error for *B*, *β* stands for Standardized Coefficient, *t* stands for *t*-statistic, *p* stands for *p*-value

Differences Between First- and Second-Cycle Primary School Teachers

To examine differences between primary school teachers of the first cycle and the second cycle, additional analyses were conducted on a subsample of teachers employed in primary schools. After data filtering (school type = 1 or 2), a grouping variable was created, distinguishing first from second cycle teachers. The distributions of EE, DP, and PA scores were assessed using descriptive indicators of skewness and kurtosis and were evaluated as approximately normal, which justified the use of parametric tests. Differences between the groups in age and dimensions of professional burnout were examined using independent-samples *t*-tests. Prior to each analysis, homogeneity of variances was assessed using Levene's test; in cases where no significant variance differences were detected, the standard version of the t-test was applied. Differences in educational attainment between the groups were analyzed using the chi-square test of independence.

Demographic Differences Between Teacher Groups

The analysis first examined differences in basic demographic characteristics of teachers, specifically age. The results of the independent-samples t-test indicated a statistically significant difference in age between first-cycle and second-cycle teachers. On average, first-cycle teachers were older ($M = 3.26$, $SD = 0.99$) than second-cycle teachers ($M = 3.01$, $SD = 0.99$), $t(524.90) = 3.13$, $p = .002$.

The chi-square test of independence did not indicate a statistically significant association between teachers' role and level of education, $\chi^2(3) = 1.16$, $p = .762$. Both groups exhibited a similar educational structure, with the majority of teachers in each group having completed undergraduate or master's studies.

Table 10
The Structure of the Level of Education of First-Cycle Teachers and Second-Cycle Teachers in Primary Schools

Education level	First-Cycle Teachers %	Second-Cycle Teachers %	Sum %
Bachelor	52.4	48.3	49.9
Master	44.7	48.8	47.2
Specialist studies	2.0	1.9	1.9
PhD	0.8	1.1	1.0
Sum	100.0	100.0	100.0

Differences of Burnout Levels Between Teacher Groups

The independent-samples *t*-test did not indicate a statistically significant difference in levels of EE between first-cycle teachers and second-cycle teachers. Although second-cycle teachers reported a slightly higher mean level of EE ($M = 3.43$, $SD = 1.39$) compared to first-cycle teachers ($M = 3.33$, $SD = 1.39$), this difference was not statistically significant, $t(619) = -0.86$, $p = .388$. The results of the t-test revealed a statistically significant difference in levels of PA between the two teacher groups. First-cycle teachers

reported higher mean levels of PA ($M = 4.69$, $SD = 0.83$) compared to second-cycle teachers ($M = 4.28$, $SD = 0.85$), $t(619) = 5.85$, $p < .001$. A statistically significant difference was also observed in levels of DP between first-cycle teachers and second-cycle teachers. Second-cycle teachers exhibited higher levels of DP ($M = 1.53$, $SD = 0.96$) than first-cycle teachers ($M = 1.32$, $SD = 1.00$), $t(619) = -2.65$, $p = .008$.

Discussion

The aim of this study was to explore the relationships between personal and workplace-related factors and their contribution to teacher burnout in Serbia. The results demonstrated significant associations between these factors and burnout levels, rejecting the null hypothesis. Teachers simultaneously reported high levels of personal accomplishment alongside elevated EE and DP. This paradox may reflect the distinction between perceived professional value and the emotional costs of work: teachers may experience their work as meaningful and professionally fulfilling, while also carrying a substantial emotional burden that contributes to exhaustion and emotional distancing. This pattern aligns with contemporary conceptualizations of burnout as a complex and dynamic process, in which its core dimensions may develop relatively independently (Leiter et al., 2023; Saloviita & Pakarinen, 2021).

Hypothesis 1, that teachers with longer working experience have higher burnout levels, was confirmed. Seniority was strongly associated with higher EE and DP, suggesting that cumulative exposure to workplace stressors contributes to burnout in time. This is consistent with previous findings which show that teachers with more than 11 years of experience report higher burnout, especially EE (Yorulmaz & Altınkurt, 2018). At the same time, seniority positively predicted DP, while age functioned as a negative predictor. Although these variables are usually closely related, this finding suggests that DP may be shaped more by prolonged professional strain than by age itself. This supports the models that emphasize the role of job demands and resources in burnout development (Bakker & de Vries, 2021; Hakanen et al., 2006). Hypothesis 2 was also supported, as lower material status was linked to greater emotional exhaustion and DP, while better financial conditions appeared protective, which was in line with previous research (Candeias et al., 2020). Hypothesis 3 was confirmed as well: older teachers showed lower levels of EE and DP, which may reflect stronger coping mechanisms and more realistic professional expectations, consistent with findings that younger teachers are more vulnerable to burnout (Al Asadi et al., 2018; Zhang, 2022).

Hypothesis 4, concerning burnout levels of teachers from different school types, was partially supported. Teachers in secondary education reported significantly lower EE than those in primary schools, supporting the previous findings that primary school teachers often work in more emotionally demanding environments with less autonomy (Kimsesiz, 2019). Additional analyses comparing first- and second-cycle primary school teachers showed no significant differences in EE, but revealed differences in other burnout dimensions. First-cycle teachers reported higher PA, likely due to stronger and more continuous relationships with students, greater visibility of pedagogical impact, and more frequent

experiences of immediate work outcomes, all recognized as protective factors against burnout (Saloviita & Pakarinen, 2021; Skaalvik & Skaalvik, 2018). In contrast, second-cycle teachers showed higher DP, possibly because of larger numbers of students, fragmented relationships, and stronger evaluation pressures, which may encourage emotional distancing as a coping strategy (Leiter et al., 2023). This pattern supports the view of burnout as a multidimensional phenomenon shaped by systemic and organizational factors, including work organization and access to support (Bakker & de Vries, 2021; Hakanen et al., 2006).

Hypothesis 5 was confirmed, as teachers of social, artistic, and practical subjects reported lower EE and higher PA than teachers of natural sciences. This is consistent with previous studies showing higher burnout among STEM teachers due to heavier workloads, stronger pressure related to student achievement, technology integration, and increased professional demands (Agyapong et al., 2022; Magtalas & Eduvala, 2024; Saloviita & Pakarinen, 2021; Tu et al., 2025). These findings support the assumption that STEM teachers may face an elevated burnout risk due to cumulative technical and curricular demands.

Hypothesis 6, regarding the function of homeroom teacher, was partially confirmed. Homeroom teacher status showed a borderline significant tendency toward higher EE and lower PA, although the effect did not reach full statistical significance across all burnout dimensions. This role often includes additional administrative, organizational, and emotional responsibilities beyond teaching itself, such as intensive communication with parents, documentation, and student support. Previous studies consistently show that emotional demands and administrative workload contribute to EE and DP, supporting the assumption that homeroom teachers may face greater burnout risk (Hakanen et al., 2006; Leiter et al., 2023; Skaalvik & Skaalvik, 2018).

Finally, Hypothesis 7 was confirmed, as gender and level of education were not significant predictors of burnout. Although burnout is often reported more frequently among women, gender differences are frequently shaped by broader organizational roles, access to autonomy, and career position rather than gender itself (Schaufeli & Buunk, 2003). Research on teachers remains inconsistent, and some studies report no significant gender differences, such as among Finnish primary school teachers (Saloviita & Pakarinen, 2021). Regarding educational level, the present findings differ from earlier studies suggesting that teachers with higher academic degrees may report higher burnout (Yorulmaz & Altınkurt, 2018), indicating that this factor requires further investigation.

Conclusion

This study examined the relationship between personal and work-related characteristics and teacher burnout within the Serbian educational context. The findings suggest that burnout is not uniformly distributed among teachers, but is shaped by a combination of individual characteristics and workplace conditions. Certain factors emerged as more strongly related to emotional exhaustion and depersonalization, while others appeared to function as protective elements, particularly in relation to personal accomplishment. These results underscore the importance of addressing teacher burnout through systemic and context-sensitive approaches rather than focusing solely on individual resilience.

Understanding the connection between specific work and personal characteristics and burnout may contribute to the development of more targeted preventive strategies within the educational system.

Limitations

Several limitations of this study should be acknowledged. First, its cross-sectional design does not allow causal conclusions about the relationships between personal/workplace-related characteristics and burnout dimensions, so longitudinal studies are needed to clarify the direction of these associations over time. Second, the explained variance in burnout outcomes was modest, suggesting that other unmeasured factors may play an important role. Psychological variables such as self-efficacy, coping style, and perceived social support were not directly assessed and should be included in future research. Cultural characteristics specific to Serbian educational context may also limit the generalizability of these findings, making cross-national comparative studies particularly valuable. In addition, professional development was measured only through frequency of participation, without considering its type, intensity, or whether it was voluntary or mandatory, which should be examined more precisely in future studies.

It should also be noted that, although the instruments used were psychometrically validated, they do not fully capture important features of the contemporary school context, such as administrative workload, pressures related to external evaluations, and rapid curricular changes. These factors may represent major sources of teacher burnout and may partly explain the relatively low correlations and limited explained variance found in this study (Salovita & Pakarinen, 2021; Skaalvik & Skaalvik, 2018). Therefore, while the study contributes to understanding individual correlates of burnout, it does not provide a comprehensive explanation of the phenomenon, since key organizational and systemic factors were not directly assessed. Only broader school-level characteristics, such as school type, field of study, and school setting, were included in the analysis as contextual indicators.

Recommendations

Within this framework, the present study offers several practice-oriented implications for the Serbian educational context. The finding that teachers report both high EE and high PA suggests that burnout prevention should not focus only on strengthening motivation or professional meaning, but also on helping teachers establish sustainable emotional boundaries in everyday practice. Future research should therefore examine the specific sources of EE more closely, as identifying these mechanisms could support more targeted interventions and reduce overall burnout levels. The finding that professional seniority, but not chronological age, predicts burnout highlights the importance of cumulative exposure to workplace stressors, particularly in systems where individuals may enter teaching later in life. This points to the value of collective support formats, such as peer mentoring, communities of practice, and group-based counselling aimed at mitigating long-term professional strain (Farber, 2000; Ly & Hong, 2025).

The association between lower material status and higher burnout further emphasizes the importance of structural economic conditions, suggesting that improving teachers' financial security may be a meaningful strategy for prevention. Differences between first-cycle and second-cycle teachers, especially higher PA and lower DP among first-cycle teachers, deserve further attention, as these teachers may represent useful models of adaptive practice. Higher burnout among STEM teachers may reflect increasing curricular and technological demands, indicating the need for targeted professional development, stronger staffing support, and collaborative curriculum planning (Voogt et al., 2011). Finally, the role of the class teacher remains an underexplored yet potentially critical factor in understanding teacher burnout, highlighting the need for future research and for considering enhanced institutional support for this role. More broadly, burnout should be understood as the result of interactions between individual and contextual factors rather than solely as an individual coping problem (Bakker & de Vries, 2021; Hakanen et al., 2006). Preventive efforts should therefore include not only individual-level interventions, but also organizational changes such as reducing administrative burden, smaller class sizes, formal mentoring systems, and stronger school leadership support (Leiter et al., 2023). The limited assessment of such structural factors in thisstudy further highlights the need for future research focused on institutional support mechanisms and systemic conditions shaping teacher burnout.

Data availability

Data will be made available on request.

Declaration of generative AI in scientific writing

An AI-based tool was used during the preparation of this paper for stylistic editing and language enhancement of the English text, without affecting the content or scientific conclusions.

References

Aflakseir, A., & Nemati, O. (2018). Association Between Work—Related Stress and Burnout Among a Group of the Elementary and High School Teachers in Zarrin—Dasht—Fars. *International Journal of School Health*, *5*(2), 1-4. https://doi.org/10.5812/intjsh.64096

Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022). Stress, Burnout, Anxiety and Depression among Teachers: A Scoping Review. *International Journal of Environmental Research and Public Health*, *19*(17), 10706. https://doi.org/10.3390/ijerph191710706

Al Asadi, J., Khalaf, S., Al Waaly, A., Abed, A., & Shami, S. (2018). Burnout among primary school teachers in Iraq: Prevalence and risk factors. *Eastern Mediterranean Health Journal*, *24*(3), 262–268. https://doi.org/10.26719/2018.24.3.262

Bakker, A. B., & de Vries, J. D. (2021). Job demands–resources theory and self-regulation: New explanations and remedies for job burnout. *Anxiety, Stress, & Coping, 34*(1), 1–21. https://doi.org/10.1080/10615806.2020.1797695

Buonomo, I., Fatigante, M., & Fiorilli, C. (2017). Teachers' Burnout Profile: Risk and Protective Factors. *The Open Psychology Journal*, *10*(1), 190–201. https://doi.org/10.2174/1874350101710010190

Candeias, A., Galindo, E., Calisto, I., Borralho, L., & Reschke, K. (2020). Stress and burnout in teaching. Study in an inclusive school workplace. *Health Psychology Report*, *9*(1), 63–75. https://doi.org/10.5114/hpr.2020.100786

Chang, M. L. (2013). Toward a theoretical model to understand teacher emotions and teacher burnout in the context of student misbehaviour: Appraisal, regulation and coping. *Motivation and Emotion, 37*(4), 799-817. https://doi.org/10.1007/s11031-012-9335-0

Durr, T., Chang, M.L., & Carson, R. L. (2014). Curbing teacher burnout: the transactional factors of teacher efficacy and emotion management. In P. W. Richardson, S. A. Karabenick, & H. M. G. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 198-213). Routledge.

Eurydice. (2025). *Serbia overview.* European Education and Culture Executive Agency. https://eurydice.eacea.ec.europa.eu/eurypedia/serbia/overview

Farber, B. A. (2000). Treatment strategies for different types of teacher burnout. *Journal of Clinical psychology, 56*(5), 675-689. https://doi.org/10.1002/(SICI)1097-4679(200005)56:5%3C675::AID-JCLP8%3E3.0.CO;2-D

Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology, 43*(6), 495 -513. https://doi.org/10.1016/j.jsp.2005.11.001

Herman, K. C., Hickmon-Rosa, J. E., & Reinke, W. M. (2018). Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *Journal of Positive Behavior Interventions, 20*(2), 90–100. https://doi.org/10.1177/1098300717732066.

Kim, L. E., & Burić, I. (2020). Teacher self-efficacy and burnout: Determining the directions of prediction through an autoregressive cross-lagged panel model. *Journal of Educational Psychology*, *112*(8), 1661–1676. https://doi.org/10.1037/edu0000424

Kimsesiz, F. (2019). The effect of school type on EFL teachers' burnout: The case in Turkey. *Dil ve Dilbilimi Çalışmaları Dergisi*, *15*(4), 1413–1425. https://doi.org/10.17263/jlls.668533

Leiter, M. P., Maslach, C., & Schaufeli, W. B. (2023). Burnout at work: A psychological perspective. *Current Directions in Psychological Science, 32*(1), 3–9. https://doi.org/10.4324/978131589416

Ly, N. T., & Hong, N. V. (2025). Effects of professional learning communities on job satisfaction of female teachers in Vietnam. *International Journal of Evaluation and Research in Education, 14*(1), 85-93. http://doi.org/10.11591/ijere.v14i1.30232

Maghnouj, S., Bethell, G., Guthrie, C., Kitchen, H., & Salinas, D. (2020). *OECD reviews of evaluation and assessment in education: Serbia*. OECD Publishing. https://doi.org/10.1787/225350d9-en

Magtalas, S. A., & Eduvala, J. C. (2024). Teacher's workload in relation to burnout and work performance. *International Journal of Multidisciplinary: Applied Business and Education Research, 5*(10), 4111–4123. https://doi.org/10.11594/ijmaber.05.10.24

Marek, T., Schaufeli, W. B., & Maslach, C. (2017). *Professional burnout: Recent developments in theory and research.* Routledge.

Marić Jurišin, S. i Malčić, B. (2022). *Samoprocena nastavničke profesije u savremenom obrazovnom kontekstu.* Filozofski fakultet Univerziteta u Novom Sadu.

Marić, N., Maksimović, N., i Bulat, P. (2024). Sindrom sagorevanja na radu kod prosvetnih radnika. *Medicinski podmladak, 71*(2), 258-268.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior*, *2*(2), 99–113. https://doi.org/10.1002/job.4030020205

Maslach, C., Jackson, S. E., & Leiter, M. P. (2016). *Maslach Burnout Inventory Manual* (Fourth Edition). Mind Garden.

Pravilnik o stalnom stručnom usavršavanju i napredovanju u zvanja nastavnika, vaspitača i stručnih saradnika (2021). Prosvetni glasnik, Službeni glasnik RS, br.109/2021.

Padmanabhanunni, A., & Pretorius, T. B. (2023). Teacher Burnout in the Time of COVID-19: Antecedents and Psychological Consequences. *International Journal of Environmental Research and Public Health*, *20*(5), 4204. https://doi.org/10.3390/ijerph20054204

Piperac, P., Todorovic, J., Terzic-Supic, Z., Maksimovic, A., Karic, S., Pilipovic, F., & Soldatovic, I. (2021). The Validity and Reliability of the Copenhagen Burnout Inventory for Examination of Burnout among Preschool Teachers in Serbia. *International Journal of Environmental Research and Public Health*, *18*(13), 6805. https://doi.org/10.3390/ijerph18136805

Popović, D., Minić, V. i Antonijević, R. (2023). Kontekstualni okvir i prevencija sindroma sagorevanja profesionalaca u vaspitno-obrazovnim ustanovama. *Nastava i vaspitanje, 72*(1), 59-72. https://doi.org/10.5937/nasvas2301059P

Rajendran, N., Watt, H. M. G., & Richardson, P. W. (2020). Teacher burnout and turnover intent. *The Australian Educational Researcher*, *47*(3), 477–500. https://doi.org/10.1007/s13384-019-00371-x

Ranđelović, K., Stojiljković, S., i Milojević, M. (2013). Personalni faktori sindroma izgaranja kod nastavnika u okviru teorije samoodređenja. *Zbornik Instituta za pedagoška istraživanja*, *45*(2), 260-281. http://doi.org/10.11591/ijere.v14i1.30232

Saloviita, T., & Pakarinen, E. (2021). Teacher burnout explained: Teacher-, student-, and organisation-level variables. *Teaching and Teacher Education*, *97*, 103221. https://doi.org/10.1016/j.tate.2020.103221

Schaufeli, W. B., & Buunk, B. P. (2003). Burnout: An Overview of 25 Years of Research and Theorizing. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (Eds.), *The Handbook of Work & Health Psychology* (pp. 383–425). John Wiley & Sons. https://doi.org/10.1002/0470013400.ch19

Schaufeli, W. B., Leiter, M. P., & Maslach, C. (2009). Burnout: 35 years of research and practice. *Career Development International, 14*(3), 204–220. https://doi.org/10.1108/13620430910966406

Skaalvik, E. M., & Skaalvik, S. (2018). Job demands and job resources as predictors of teacher motivation and well-being. *Social Psychology of Education*, *21*, 1251–1275. https://doi.org/10.1007/s11218-018-9464-8

Skaalvik, E. M., & Skaalvik, S. (2014). Teacher self-efficacy and perceived autonomy: Relations with teacher engagement, job satisfaction, and emotional exhaustion. *Psychological Reports, 114*(1), 68–77. https://doi.org/10.2466/14.02.PR0.114k14w0

Tu, L., Rao, Z., Jiang, H., & Dai, L. (2025). Technostress, burnout, and job satisfaction: An empirical study of STEM teachers' well-being and performance. *Behavioral Sciences, 15*(7), 992. https://doi.org/10.3390/bs15070992

Univerzitet u Novom Sadu. (2020). *Kodeks o akademskom integritetu* (prečišćen tekst). https://www.uns.ac.rs/index.php/univerzitet/javnost-rada/dokumenti/aktiuns/send/35-pravilnici/321-kodeks-o-akademskom-integritetu

Unterbrink, T., Hack, A., Pfeifer, R., Buhl-Grießhaber, V., Müller, U., Wesche, H., Frommhold, M., Scheuch, K., Seibt, R., Wirsching, M., & Bauer, J. (2007). Burnout and effort–reward-imbalance in a sample of 949 German teachers. *International Archives of Occupational and Environmental Health*, *80*(5), 433–441. https://doi.org/10.1007/s00420-007-0169-0

Voogt, J., Westbroek, H., Handelzalts, A., Walraven, A., McKenney, S., Pieters, J., & De Vries, B. (2011). Teacher learning in collaborative curriculum design. *Teaching and teacher education, 27*(8), 1235-1244. https://doi.org/10.1016/j.tate.2011.07.003

Yorulmaz, Y. İ., & Altınkurt, Y. (2018). The examination of teacher burnout in Turkey: A meta-analysis. *Turkish Journal of Education*, *7*(1), 34–52. https://doi.org/10.19128/turje.348273

Zhang, L., Zhao, J., Zheng, H., Xiao, Y., Chen, M., Chen, D., & Xiao, H. (2014). Mental health and burnout in primary and secondary school teachers in the remote mountain areas of Guangdong Province in the People's Republic of China. *Neuropsychiatric Disease and Treatment*, *10*, 123-130. https://doi.org/10.2147/NDT.S56020

Zhang, Y., & Zhu, Y. (2022). Effects of educational robotics on the creativity and problem-solving skills of K-12 students: A meta-analysis. *Educational Studies*, *50*(6), 1539-1557. https://doi.org/10.1080/03055698.2022.2107873

Article received: 11.07.2025.
Updated version received: 14.01.2026.
Accepted for publishing: 10.02.2026.

Stanislava Marić Jurišin
Department of Pedagogy, Faculty of Philosophy, University of Novi Sad, Novi Sad, Serbia
https://orcid.org/0000-0002-4184-3309

Borka Malčić
Department of Pedagogy, Faculty of Philosophy, University of Novi Sad, Novi Sad, Serbia
https://orcid.org/0000-0002-1862-962X

Snežana Jokić
Technical Faculty, University of Novi Sad, Zrenjanin, Serbia
https://orcid.org/0000-0002-4756-9435

Simona Bekić
Department of Pedagogy, Faculty of Philosophy, University of Novi Sad, Novi Sad, Serbia
https://orcid.org/0000-0002-0974-8846

This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Studies in Teaching and Education, 2026, *75*(2), 457-470
https://doi.org/10.5937/niv75-64857

ISSN 0547-3330
eISSN 2560-3051
Original research paper

The Home Library as a Mediator of the Relationship between Parental Education and Students' Achievement on PISA Assessments in Serbia

Snežana Štrangarić[1]
Faculty of Education in Sombor, University of Novi Sad, Sombor, Serbia
Vesna Rodić Lukić
Faculty of Education in Sombor, University of Novi Sad, Sombor, Serbia

Abstract *Drawing on scholarly culture theory and cultural reproduction theory, this paper examines the role of the number of books in the home library as a mediating variable in the relationship between parents' level of formal education and students' achievement on the PISA assessment. A secondary analysis was conducted using data collected within the 2022 PISA study on a sample of students from Serbia (N=620). To examine the relationships between maternal and paternal education, the number of books in the respondents' homes, and students' achievement in reading, mathematical, and scientific literacy, partial least squares structural equation modeling (PLS-SEM) was applied. The results show that the number of books in the home library has a statistically significant and positive effect on all three domains of functional literacy, and that the educational level of both parents significantly contributes to greater availability of this cultural resource in the family environment. At the same time, significant indirect effects of parental education on students' PISA achievement were identified, indicating the mediating role of the number of books in the home. Given the relatively low values of explained variance, this effect should not be interpreted as a direct causal influence, but rather as an indicator of broader, structurally embedded processes of cultural and educational reproduction. The findings contribute to a better understanding of educational inequalities in Serbia, suggesting that the number of books in the home library represents a visible marker of cultural capital that mediates the intergenerational transmission of educational advantages.*

Keywords: *home library, number of books, parental education, PISA achievement, cultural capital.*

1 snezana.strangaric@uns.ac.rs

Introduction

Despite the accelerated development of information technologies and the increasing dominance of digital media in everyday life, the book in its material, printed form retains multilayered cultural and social significance (Phillips & Kovač, 2022; Rodger, 2018; Štrangarić, 2022). The physical presence of books does not represent exclusively a functional source of knowledge, but also a symbolic resource that shapes the individual's relationship toward education, culture, and the development of intellectual capacities. Books, even when they are not actively used, represent an available research tool (da Col, 2015; Karijer i Eko, 2011) and participate in the construction of the cultural environment, signaling values and norms that are considered legitimate and desirable in the family.

The symbolic dimension of the book gains importance in the educational context, where numerous empirical studies on large samples systematically confirm the positive connection between possessing books in the home and students' academic achievement (Addido et al., 2025; Evans et al., 2010; Evans et al., 2014; Volodina, 2025). Secondary analyses of the empirical material collected within international comparative studies, such as PISA and TIMSS, show that students who grow up in an environment with a greater number of books achieve better results in different domains of literacy, including reading, mathematical, and scientific literacy, while possessing books in electronic format has not shown significant effects (Heppt et al., 2022). These findings have been confirmed in different national and cultural contexts (Addido et al., 2025), including the context of contemporary Serbian society (Marić i sar., 2018; Radulović et al., 2020; Rodić Lukić et al., 2020; Štrangarić i sar., 2017; Štrangarić i Rodić Lukić, 2024), which indicates the relative universality of the effect of a home library on educational achievement.

The presence of books in the home contributes to the formation of a scholarly culture (Evans et al., 2014; Sikora et al., 2019). Scholarly culture is transmitted during the process of socialization through everyday practices, habits, and implicit messages about the importance of learning and the acquisition of knowledge. In such environment, children come into contact with written language earlier, develop positive attitudes toward reading, and adopt cognitive and metacognitive strategies that are compatible with the demands of the formal educational system. Even if reading is not practiced intensively, the books themselves retain symbolic value that shapes attitudes and expectations regarding educational success.

Within the theory of social and cultural reproduction, established by a French sociologist Pierre Bourdieu, possession of books within home libraries is observed in a significantly broader social context compared to the theory of scholarly culture. While the theory of scholarly culture observes home library as an isolated indicator of socialization oriented toward books (Sikora et al., 2019), for Bourdieu, the possession of books in a home library represents the most significant, but nevertheless only one of the indicators of cultural capital in its objectified form. Objectified cultural capital is only one of the forms of cultural capital and acts in synergy with other forms – embodied and institutionalized. Furthermore, cultural capital is only one of the forms of capital which, in interaction with other forms of capital – economic, social, and symbolic – contributes to the reproduction and legitimization of social inequalities (Bourdieu, 1986).

From the stated theoretical perspectives, the home library simultaneously represents both a material good and a highly valued cultural good (Thumala Olave, 2020), and is observed as part of a broader system of cultural practices and lifestyles that are deeply class-conditioned (Bourdieu, 1973; Burdije, 2012; Burdije, 2023). A significant characteristic of cultural capital is its' intergenerational transferability. In that sense, a higher educational level of parents, as an indicator of institutionalized cultural capital, increases the probability not only that books will be present in the home, but also that they will be integrated into everyday practices through conversations (Chiu & Chow, 2010), shared reading, and the valuation of intellectual activities. In that way, books become a means of symbolic legitimization and part of the mechanism through which educational inequalities are reproduced through generations (Burdije & Paseron, 2014). In that sense, Bourdieu's theory evaluates the process of preschool socialization as a crucial point, in which embodied cultural capital develops, resulting in the fact that knowledge of and familiarity with legitimate culture, although acquired, both appear as hereditary. Knowledge of legitimate culture acquired in that way will later be recognized and rewarded in the educational system.

Certain studies created following Bourdieu's legacy conceptualize the approach of cultural adaptation (Cvetičanin, 2007), emphasizing that socialization for cultural practices is a lifelong process and that it has a cumulative character during the educational trajectory (Aschaffenburg & Mass, 1997). Through the concept of cultural adaptation, an attempt is made to identify the significance of experiences acquired in a later life period, through the process of formal education, in workplace climate, and through adaptation to different social environments.

In contemporary research of educational inequalities, the variable of the number of books in a home library is frequently used and it is evaluated not only as an empirically accessible and relatively stable indicator of cultural capital, but also as a proxy for a broader spectrum of family resources and practices (Breznau et al., 2019; Heppt et al., 2022). Nevertheless, there are some methodological inconsistencies. Certain authors warn that this indicator is not free of limitations, since it may reflect other, difficult-to-measure aspects of the family environment as well. Questions are also opened concerning the cognitive abilities of children to precisely estimate the number of books in a home library (Engzell, 2018; Eriksson et al., 2022).

Despite the stated methodological dilemmas, the empirical findings show that the number of books in a home remains a strong predictor of educational outcomes, including linguistic abilities, mathematical skills, but also broader cultural orientations and life aspirations (Brunarska & Ivlevs, 2025; Sikora et al., 2019). Nevertheless, in accordance with the stated theoretical starting points, it is important to emphasize that the consistency of the effects of a home library in different cultural contexts does not indicate that the number of books in a home acts as an isolated causal factor, but rather as a visible marker of deeper, structurally rooted inequalities. Therefore, instead of interpreting this mediation as a direct effect, where more books necessarily lead to better results, it is theoretically more justified to speak about a structured chain of influences, in which books represent a visible point of intersection of the institutionalized cultural capital of parents – articulated

in their level of formal education – with the dispositions of students and the demands of the academic field. Accordingly, the empirical examination of the mediating role of the number of books can be evaluated as analytically useful, not because the significance of books is thereby discovered or confirmed, but because it thereby enables the insight into the mechanisms of cultural and educational reproduction.

For that reason, our research represents a kind of intersection point of the theory of scholarly culture and the theory of cultural reproduction. Unlike previous research of cultural capital in our society (Marić i sar., 2018; Radulović et al., 2020; Rodić Lukić et al., 2020; Štrangarić i sar., 2017; Štrangarić i Rodić Lukić, 2024), where a home library was observed as one of the elements of cultural capital in objectified form, at this point we specifically want to investigate the significance of the home library itself in accordance with the theory of scholarly culture. Nevertheless, in accordance with the theory of cultural capital, we will observe it as a mediator between parents' education and academic achievement. We consider that, precisely through the examination of the mediating role, it is possible to critically reexamine the reach of the theory of scholarly culture and at the same time to operationalize Bourdieu's thesis on the transformation of cultural capital into educational advantage in the contemporary educational context.

The special analytical significance of the home library is reflected in the context of PISA research, since PISA does not measure the reproduction of school material, but examines the ability of applying knowledge in new and complex situations through developed functional competencies that are necessary for the active participation in contemporary societies. Reading literacy, mathematical literacy, and scientific literacy develop in the interaction of formal education and the broader cultural environment, which makes the family context a key space of their shaping (Avvisati, 2020).

Starting from the stated theoretical and empirical insights, this research seeks to contribute to the understanding of the mechanisms of cultural and educational reproduction in Serbia, by examining the role of the number of books in the home library as a mediating factor in the relationship between the educational status of parents and the PISA competencies of students aged 15 years. The number of books in a home library is not approached as a causal variable in the narrow sense, but as an analytical tool for understanding complex processes of social and educational reproduction in contemporary Serbian society. The contribution of this research is reflected in the critical elucidation of the mechanisms through which cultural resources are translated into measurable educational outcomes – the process in which books within the home library have a significant role.

Methodology

Research Aim

By a secondary analysis of empirical material collected within the 2022 PISA assessment, we sought to determine the connection of the educational level of parents and the number of possessed books within the home library with the competencies of students from Serbia.

Sample

The data were analyzed by applying the structural modeling technique, using the partial least squares method (PLS-SEM), by which relationships between sets of variables are examined. The primary research included 6413 respondents from Serbia. Considering that , in the application of structural modeling, analysis on a smaller sample is recommended (Hair et al., 2017), a representative subsample which included 620 students was formed. The structure of our sample consists of 321 female and 299 male respondents. The sample was drawn by applying random sampling, whereby representativeness was ensured.

Instruments and Variables

Variables relating to the level of parents' education, the number of books within the home library, and student achievement in three literacy domains were analyzed. The data were obtained by applying the instruments of the PISA battery of tests for students and the PISA student questionnaire.

The PISA battery of tests for students included three cognitive tests, by which student achievement in the field of reading literacy, scientific literacy, and mathematical literacy was measured. All students included in our sample completed the questionnaires and participated in the assessment of the stated competencies. Achievement in mathematical, reading, and scientific literacy was presented by scaled values and analyzed as dependent variables.

Table 1
Number of Books in the Home Library (N = 620)

Number of books	N	%
No books	35	5.6
1 – 10 books	87	14.0
11 – 25 books	117	18.9
26 – 100 books	199	32.1
101 – 200 books	90	14.5
201 – 500 books	57	9.2
More than 500 books	29	4.7
No response	6	1

PISA student questionnaire. The number of books in a home library was used as an indicator of an educationally stimulating environment and analyzed as a mediator. Out of a total of 620 students, 614 students (99%) provided a valid answer to the question about the number of books at home. The largest percentage of students (32.1%) stated that there were 26 – 100 books in their home, then 18.9% stated that they possessed 11 – 25 books, while 14% declared that they had 1 – 10 books at home. Not possessing a single book was stated by 5.6% of students, while only 4.7% stated that they had more than

500 books in their home library. The distribution of answers indicates that most students come from a family environment with a moderate number of books (between 11 and 100 books makes up 51.3% of the sample), which may indicate a medium level of availability of cultural and educational resources within the family.

Table 2
Mother's Level of Education (N = 620)

Level of education	N	%
Without primary education	1	.2
ISCED 1 (incomplete primary education)	2	.3
ISCED 2 (complete primary education)	40	6.5
ISCED 3.3 (gymnasium)	45	7.3
ISCED 3.4 (secondary vocational education)	134	21.6
ISCED 4	44	7.1
ISCED 5 (higher education)	126	20.3
ISCED 6 (high education)	109	17.6
ISCED 7 (master studies)	53	8.5
ISCED 8 (doctoral studies)	58	9.4
No response	8	1.3

Table 3
Father's Level of Education (N = 620)

Level of education	*N*	%
Without primary education	1	.2
ISCED 1 (incomplete primary education)	3	.5
ISCED 2 (complete primary education)	28	4.5
ISCED 3.3 (gymnasium)	83	13.4
ISCED 3.4 (secondary vocational education)	134	21.6
ISCED 4	57	9.2
ISCED 5 (higher education)	116	18.7
ISCED 6 (high education)	87	14
ISCED 7 (master studies)	46	7.4
ISCED 8 (doctoral studies)	52	8.4
No response	13	2.1

The educational level of parents was classified according to the ISCED scale and treated as an exogenous variable. Valid answers to the question about mother's education were given by 612 students (98.7%). The most frequently reported level of mother's education is ISCED 3.4 (21.6%), which corresponds to the completion of secondary school with the possibility of transition to higher education. It is followed by ISCED 5 (20.3%) and ISCED 6 (17.6%), which denote post-secondary education and university qualifications. Observed cumulatively, more than half of mothers (55.8%) have education at ISCED level 5 or higher, which indicates a relatively high educational status of mothers in the sample. The data on father's education were available for 607 students (97.9%). The most represented level of education is also ISCED 3.4 (21.6%), followed by ISCED 5 (18.7%) and ISCED 6 (14%). In total, 48.5% of fathers have education at ISCED 5 or higher, which is somewhat lower in comparison to mothers, but still indicates a significant share of highly educated parents in the sample.

Data Analysis

The data used in this research were analyzed by applying the partial least squares structural equation modeling technique (PLS-SEM), which enables the examination of complex relationships between latent variables. Statistical processing was conducted using SmartPLS4 software, and the analyzed model included two exogenous latent variables (mother's education and father's education), one mediating variable (the number of books in the home library), and three endogenous variables (achievement in reading, mathematical, and scientific literacy).

The structural model was estimated on the basis of standardized path coefficients, whereby direct and indirect relationships between variables were tested. For testing the significance of effects, a *bootstrap* procedure with 5000 replications was used, whereby t-values and p-values were obtained for the assessment of the statistical significance of paths. Evaluation of model quality was performed on the basis of the values of coefficients of determination (R^2), which represent the percentage of explained variance for each dependent variable. In accordance with the recommendations in the literature, R^2 values of .75, .50, and .25 can be interpreted as high, moderate, and low (Hair et al., 2011).

Special attention was devoted to the examination of the mediating effects of the number of books in the household, in order to determine whether and to what extent the educational level of parents affects students' educational achievement indirectly through the availability of cultural and educational resources in the home environment. On the basis of total and specific indirect effects, the statistical significance of mediation was estimated, with the interpretation of effects in accordance with contemporary standards for PLS modeling. Considering that the research is focused on predictive relationships, and not on the confirmation of theoretical models, the PLS-SEM approach was evaluated as methodologically appropriate.

Results

The results of partial least squares (PLS-SEM) structural modeling indicate statistically significant relationships between parents' education, the number of books in the home library, and student achievement in the fields of reading, mathematical, and scientific literacy.

The analysis of direct effects shows that the number of books in the home library has a strong positive influence on all three dimensions of literacy: on mathematical literacy (β=.295, p<.001), on reading literacy (β=.302, p<.001), and on scientific literacy (β=.287, p<.001). The results indicate that students who have a greater number of books at home achieve higher results on PISA tests.

Parents' education has a significant influence on the number of books in the home library. Father's education (FISCED) shows a stronger effect (β=.168, p<.001) in comparison with mother's education (MISCED; β=.126, p=.004). The stated results indicate that a higher level of parents' education contributes to greater availability of cultural and educational resources in the family environment.

Table 4
Structural Paths and Mediating Effects in the PLS Model

Relationship	β coefficient	*t*-value	*p*-value
Direct Effects			
NB → ML	.295	7.65	< .001
NB → RL	.302	7.59	< .001
NB → SL	.287	7.36	< .001
FE → NB	.168	3.88	< .001
ME → NB	.126	2.86	.004
Indirect Effects (Mediation)			
FE → ML	.050	3.48	.001
FE → RL	.051	3.53	<.001
FE → SL	.048	3.46	.001
ME → ML	.037	2.62	.009
ME → RL	.038	2.63	.009
ME → SL	.036	2.63	.009

Note. NB – Number of Books in the Household, *ML* – mathematical literacy, *RL* – reading literacy, *SL* – scientific literacy, *FE* – father's education level, *ME* – mother's education level.

Observed through indirect effects, the findings show that the number of books in a home library has a significant mediating role in the relationship between parents' education and students' educational achievement. Both parents have statistically significant

indirect effects on all three literacy domains. Father's education indirectly affects mathematical literacy (β=.050, p=.001), reading literacy (β=.051, p<.001), and scientific literacy (β=.048, p=.001), while mother's education has somewhat weaker, but also significant indirect effects: mathematical literacy (β=.037, p=.009), reading literacy (β=.038, p=.009), and scientific literacy (β=.036, p=.009).

The values of the coefficient of determination (R^2) indicate that the model explains a relatively small percentage of the variance of the observed dependent variables: 6.6% for the number of books, 8.7% for mathematical literacy, 9.1% for reading literacy, and 8.3% for scientific literacy, which suggests that there are other factors that additionally influence student achievement and which are not included in this model.

In conclusion, the results indicate the existence of a significant mechanism through which the educational level of parents, indirectly through the number of books in the home library, influences the level of development of functional forms of literacy among students aged 15 years.

Discussion

The conducted empirical research had the aim of examining the connection of the home library with the educational achievement of students in Serbia. The number of books in the home library was set as a mediating variable in the relationship between the level of parents' formal education and student achievement on the PISA assessment.

Although the results give relatively low R^2 values, they show that the number of books in the home library has a statistically significant and relatively uniform positive effect on all three literacy domains – reading, mathematical, and scientific literacy. This finding is in accordance with previous research, which indicates that the home library does not represent only a resource specific to a certain school area, but is conceived as a general indicator of the cultural environment that encourages the development of cognitive abilities. as well as academic skills relevant for different types of educational tasks (Evans et al., 2010; Evans et al., 2014; Sikora, 2019). In that sense, the results confirm the significance of the theory of scholarly culture because this theory describes the mechanisms through which books influence the development of reading habits and positive attitudes toward learning, as well as the acquisition of knowledge at the micro level of analysis.

However, those mechanisms can be contextualized through Bourdieu's theoretical model, because it explains that the cultural practices of different social strata are differently valued by the educational system. Bourdieu's concept of cultural capital contributes to the understanding of deeply rooted power relations which cause schools to recognize precisely those cultural forms that are characteristic of more educated strata as legitimate, by which schools enable children who originate from such families to convert their cultural resources into school success more easily.

In that regard, by further insight into the research results, significant effects of the education of both parents on the number of books within the home library were established, which, in accordance with Bourdieu's theory, indicates a strong connection between the institutionalized and objectified form of cultural capital (Bourdieu, 1986).

The finding that the effect of father's education is somewhat more pronounced in relation to mother's education can be interpreted in the light of generational differences in the educational trajectories of parents. Nevertheless, considering that a secondary analysis of a study was performed, in which direct indicators of gender roles in family educational practices are not present, this finding should be interpreted cautiously. It is important to emphasize that the results showed that both parents have statistically significant indirect effects on all three literacy domains, which implies a joint contribution of the family cultural environment to the educational outcomes of students. Although the differences in the effects that parents' education has on different literacy domains are very small, it is noticed that both mother's education and father's education indirectly have the greatest influence on students' reading literacy.

A particularly significant finding relates to the mediating role of the number of books in the home library in the relationship between the level of parents' formal education and students' PISA achievement. These results indicate that the influence of parental education on educational outcomes is not direct, but is realized through indirect mechanisms that shape the everyday environment in which children grow up. Through the theoretical synthesis of the theory of scholarly culture and the theory of cultural capital in our research, we did not observe the home library either exclusively as one of the indicators of cultural capital, nor as an isolated educational resource, but as a structurally positioned cultural practice. We can conclude that its mediating role contributes to insight into the way in which scholarly culture intersects with the mechanisms of cultural reproduction.

Although the R^2 values are relatively low, they are in accordance with the findings of previous PISA studies and indicate that the home library represents one of the relevant, but not exclusive, mechanisms that contribute to the development of student competencies. Such results confirm that the functional literacies that PISA measures are the product of complex and long-term processes of socialization for cultural practices, within which no individual factor can have a dominant causal influence.

The relatively low percentage of explained variance indicates the limitations of reductionist interpretations of the effects of a home library. Instead of being interpreted as a weakness of the model, this finding is in accordance with the theoretical framework of cultural reproduction, which emphasizes that educational inequalities are produced through an interaction of different forms of capital – cultural, economic, social and symbolic – during a longer period of time. In that sense, the number of books in a home, although analytically significant, represents only one of the segments within a broader structure shaped by unequal educational opportunities. The results of our research indicate the relevance of the examined indicator if it is observed as the "tip of the iceberg" of complex social processes. We consider that precisely in that lies the analytical strength of the variable of the number of books – not in its predictive power, but in its possibilities to make structurally hidden mechanisms of reproduction empirically visible.

Finally, the obtained results have certain implications for the interpretation of PISA findings in public and political discourse. They indicate that educational differences measured by PISA assessment cannot be adequately explained nor mitigated by interventions directed exclusively at the material aspects of the family environment. Instead, the results

of this research encourage consideration of broader structural conditions, in which cultural resources are acquired and valued, and mediated through family and school practices that translate them into forms of knowledge recognized and rewarded in the educational system. Thereby, the home library is positioned not as a simple policy instrument, but as an indicator of deeper mechanisms of cultural and educational reproduction in contemporary Serbian society.

Conclusion

The results of PISA studies open space for the conceptualization of implications for educational and cultural policies. The findings of our research contributed to the confirmation of previous empirical research, which indicate a stable connection between the number of books at home and educational achievement. However, in forming recommendations for educational policies, caution is needed in the interpretation of the results. The obtained findings cannot be reduced to a simplified normative message, that would assume that increasing the availability of books automatically leads to the reduction of educational inequalities.

PISA studies examine student competencies as a measure of functional forms of literacy, however, the development of those competencies is deeply rooted in long-term processes of socialization for cultural practices, and they cannot be significantly improved by short-term interventions directed exclusively at material resources. The interpretation of PISA results through the prism of simple causal relationships between possession of books in the home library and student achievement leads to the depoliticization of structural inequalities, because it shifts the focus from the social conditions of the production of educational differences to individual and family "deficiencies." This, of course, in no way implies that interventions directed toward improving the material conditions of students are irrelevant (Štrangarić i sar., 2017), especially when the concept of cultural adaptation in which the flexibility of cultural practices is emphasized (Cvetičanin, 2007) and the cumulative character of the appropriation of cultural capital (Aschaffenburg & Mass, 1997) are taken into consideration. Nevertheless, such interventions, although necessary, are not sufficient if they are not accompanied by broader institutional and cultural changes.

In that sense, the analytical value of the variable of the number of books in a home library does not lie in its policy-potential as an instrument of intervention, but in its ability to indicate deeper, structurally rooted mechanisms of cultural and educational reproduction. Instead of being interpreted as a means of simple "improvement" of educational outcomes, this variable should be understood as an indicator of unequal starting positions that the educational system, including systems of external evaluation such as PISA, often confirms.

Observed in that way, the mediating role of the number of books, in the relationship between the educational level of parents and students' PISA competencies, does not represent a proof of a direct pedagogical effect of books, but an empirical articulation of the mechanism of cultural reproduction. Possession of books in a home library is marked as a material point of intersection of the institutionalized cultural capital of parents and

the dispositions of children, while the educational system, through PISA measurement instruments, values precisely those competencies that are most easily developed in a such environment.

The findings of this research need to be interpreted in the light of several methodological limitations. First, the analysis is based on secondary data from the PISA study, which implies limited control over the selection and operationalization of variables. Although standardized and internationally validated indicators were used, they inevitably reduce the complex social and cultural processes that are at the basis of educational inequalities. Further, the size of home library was used as a proxy indicator of cultural capital in its objectified form, which, as such, does not define the ways in which books are used in everyday family practices. In that regard, reliance on students' self-assessment can introduce a certain degree of error, considering that research has shown that students with higher achievement estimate the number of books in the household more precisely (Eriksson et al., 2022). Besides, it is necessary to emphasize that the established relationships should be interpreted as patterns of structural conditioning, not as direct causal mechanisms.

Finally, although the sample is representative for students aged 15 years in Serbia, the results cannot automatically be generalized to other ages, educational levels, or national contexts without additional empirical verification.

Recommendations for further research imply the inclusion of variables that would encompass family educational practices, parental aspirations, and symbolic orientations toward education. Of particular significance would be longitudinal study designs that would enable a more precise examination of the mechanisms of cultural and educational reproduction through concrete life trajectories. Although the quantitative methodological orientation is adequate for research on large samples of respondents and suitable for the application of a comparative approach, an inclusion of qualitative methods would enable a deeper understanding of the significance of possession of books within home libraries, and also elucidate the ways in which cultural resources are shaped into forms of knowledge, educational orientations, and aspirations that the educational system recognizes and values.

References

Addido, J., Katende, S., Namakula, E. K., & Ogundapo, T. J. (2025). The role of students' home educational resources and parents' level of education in science achievement: Using TIMSS data for Egypt, Morocco, and South Africa. *International Journal of Research in Education and Science, 11*(1), 91-109. https://doi.org/10.46328/ijres.3582

Aschaffenburg, K., & Maas, I. (1997). Cultural and Educational Careers: The Dynamics of Social Reproduction. *American Sociological Review, 62*(4), 573-587. https://doi.org/10.2307/2657427

Avvisati, F. (2020). The measure of socio-economic status in PISA: a review and some suggested improvements. *Large-scale Assess Educ, 8*(8), 1-37. https://doi.org/10.1186/s40536-020-00086-x

Bourdieu, P. (1973). Cultural Reproduction and Social Reproduction. In R. Brown (Ed.), *Knowledge, Education and Cultural Change* (pp. 71-112). Tavistock.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of Theory and Research for Sociology of Education* (pp. 241-258). Greenwood.

Breznau, N., Sauter, L., & Salikutluk, Z. (2019). Full Shelves, Good Skills? Immigration, Adolescent Language Aptitude and New Evidence on Books in the Home from Four European Countries. *Comparative Sociology*, *19*(4-5), 465-508. https://doi.org/10.1163/15691330-BJA10019

Brunarska, Z., & Ivlevs, A. (2025). Does exposure to books foster a taste for spatial mobility? Home library size in childhood and adult migration intentions. *Migration Studies*, *13*(2), 1-20. https://doi.org/10.1093/migration/mnae011

Burdije, P. (2012). Klasni ukusi i životni stilovi. U J. Đorđević (Ur.), *Studije kulture – zbornik* (str. 155-177). Službeni glasnik.

Burdije, P., i Paseron, Ž. K. (2014). *Reprodukcija. Elementi za jednu teoriju obrazovnog sistema*. Fabrika knjiga.

Burdije, P. (2023). *Isticanje razlike: Društvena kritika moći suđenja*. Karpos.

Chiu, M. M., & Chow, B. W. Y. (2010). Culture, motivation, and reading achievement: High school students in 41 countries. *Learning and Individual Differences, 20*(6), 579-592. https://doi.org/10.1016/j.lindif.2010.03.007

Cvetičanin, P. (2007). *Kulturne potrebe, navike i ukus građana Srbije i Makedonije*. Odbor za građansku inicijativu.

da Col, G. (2015). Tsundoku. *HAU: Journal of Ethnographic Theory*, *5*(2), i-iii. https://doi.org/10.14318/hau5.2.001

Engzell, P. (2018). What do books in the home proxy for? A cautionary tale. *Sociological Methods & Research, 50*(4), 1487–1514. https://doi.org/10.1177/0049124119826143

Eriksson, K., Lindvall, J., Helenius. O., & Ryve, A. (2022). Higher-achieving children are better at estimating the number of books at home: Evidence and implications. *Frontiers in Psychology, 13*, 1-10. https://doi.org/10.3389/fpsyg.2022.1026387

Evans, M. D. R., Kelley, J., Sikora, J., & Treiman, D. J. (2010). Family Scholarly Culture and Educational Success: Books and Schooling in 27 nations. *Research in Social Stratification and Mobility, 28*(2), 171-197. https://doi.org/10.1016/j.rssm.2010.01.002

Evans, M. D. R., Kelley, J., & Sikora, J. (2014). Scholarly Culture and Academic Performance in 42 Nations. *Social Forces, 92*(4), 1573-1605. https://doi.org/10.1093/sf/sou030

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139-152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage Publications.

Heppt, B., Olczyk, M., & Volodina, A. (2022). Number of books at home as an indicator of socioeconomic status: examining its extensions and their incremental validity for academic achievement. *Social Psychology of Education, 25*, 903–928. https://doi.org/10.1007/s11218-022-09704-8

Karijer, Ž. K. i Eko, U. (2011). *Ne nadajte se da ćete se rešiti knjiga.* Gradac.

Marić, M., Rodić Lukić, V., i Štrangarić, S. (2018). Model uticaja kulturnog kapitala i individualnih motivacionih činilaca na ključne kompetencije učenika. *Primenjena psihologija, 11*(1), 9-26. https://doi.org/10.19090/pp.2018.1.9-26

Phillips, A. & Kovač, M. (2022). *Is this a book*?. Cambridge University Press. https://doi.org/10.1017/9781108938389

Radulović, M., Vesić, D., & Malinić, D. (2020). Cultural Capital and Student's Achievement: The Mediating Role of Self-efficacy. *Sociologija, 62*(2), 255-268. https://doi.org/10.2298/SOC2002255R

Rodger, N. (2018). From Book To Bookish: Repurposing the Book in the Digital Era. *Intersectionalities and Media Archaeologies, 7*(1), 1-33. https://doi.org/10.7275/511e-2k72

Rodić Lukić, V., Marić, M., & Štrangarić, S. (2020). Relational Impact of Cultural Capital and the Perception of Self-efficacy on Educational Achievement. *Teme, 44*(4), 1261-1274. https://doi.org/10.22190/TEME190321077R

Sikora, J., Evans, M. D. R., & Kelley, J. (2019). Scholarly culture: How books in adolescence enhance adult literacy, numeracy and technology skills in 31 societies. *Social Science Research, 77*, 1-15. https://doi.org/10.1016/j.ssresearch.2018.10.003

Štrangarić, S., Rodić Lukić, V., i Marić, M. (2017). Efekti kulturnog kapitala na obrazovna postignuća učenika – sekundarna analiza PISA studije. *Nastava i vaspitanje, 66*(2), 207-219. https://doi.org/10.5937/nasvas1702207S

Štrangarić, S. (2022). Uloga medija u akumulaciji kulturnog kapitala i reprodukciji društvenih nejednakosti. U S. Štrangarić, M. Cvijetić, i M. Šumonja (Ur.). *Digitalni mediji, kultura i obrazovanje: konteksti, značenja i primena – zbornik radova* (str. 169-181). Pedagoški fakultet.

Štrangarić, S., i Rodić Lukić, V. (2024). Model uticaja kulturnog kapitala i obrazovnog habitusa na PISA kompetencije učenika: primer Srbije i Hrvatske. *Sociologija*, *66*(1), 28-44. https://doi.org/10.2298/SOC2401028S

Thumala Olave, M.A. (2020). Book love. A cultural sociological interpretation of the attachment to books. *Poetics*, *81*, 1-11. https://doi.org/10.1016/j.poetic.2020.101440

Volodina, A. (2025). Books at home or own books? Relations between the number of books, cognitive and socio-emotional outcomes in secondary school students. *European Journal of Psychology of Education, 40*, Article 9. https://doi.org/10.1007/s10212-024-00919-1

Article received: 11.02.2026.
Updated version received: 06.04.2026.
Accepted for publishing: 27.04.2026.

Snežana Štrangarić
Faculty of Education in Sombor, University of Novi Sad, Sombor, Serbia
https://orcid.org/0000-0002-8131-5164

Vesna Rodić Lukić
Faculty of Education in Sombor, University of Novi Sad, Sombor, Serbia
https://orcid.org/0000-0003-0345-3606

This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Studies in Teaching and Education, 2026, *75*(2), 471-485
https://doi.org/10.5937/niv75-62148

ISSN 0547-3330
eISSN 2560-3051
Original research paper

The Relationship between Leadership Skills and Academic Achievement among Pedagogy Students: Implications for Curriculum Development

Milena Letić Lungulov[1]
Department of Pedagogy, Faculty of Philosophy,
University of Novi Sad, Novi Sad, Serbia

Jovana Turudić
Department of Pedagogy, Faculty of Philosophy,
University of Novi Sad, Novi Sad, Serbia

Saška Radujkov
Department of Pedagogy, Faculty of Philosophy,
University of Novi Sad, Novi Sad, Serbia

Abstract *The aim of this study is to examine the relationships between leadership skills and academic achievement among pedagogy students, with the intention of identifying strategies for developing leadership within the framework of initial education programs for future pedagogues. In addition, the study explores differences in the development of leadership skills across different years of study in order to determine the potential impact of academic progress on these skills. The sample consisted of 194 pedagogy students from the Faculty of Philosophy, University of Novi Sad. Leadership skills across eight domains (organization and planning, awareness of diversity, self-management, self-confidence, use of technology, cognitive development and critical analysis, interpersonal communication, problem-solving and decision-making) were assessed using an adapted version of the Student Leadership Outcomes Inventory, while academic achievement was measured by students' grade point average. The results of Pearson's correlation coefficient analysis indicate a significant relationship between academic achievement and the overall score on the Student Leadership Outcomes Inventory, as well as with specific domains – organization and planning, awareness of diversity, self-management, and self-confidence. Differences in the level of leadership skill development by year of study were not statistically significant. Based on the results obtained, interventions are proposed for enhancing leadership skills through the pedagogy curriculum. This study contributes to the understanding of the relationship between leadership skills and academic achievement, opening avenues for further studies and practical applications in the context of education and the professional development of future pedagogues.*

Keywords: *academic achievement, leadership skills, pedagogy, curriculum development.*

1 milenaletic@ff.uns.ac.rs

Introduction

Leadership is an indispensable factor in both social and professional contexts, with its universal function acknowledged as early as in the beginning of the 20th century. This was confirmed by Mumford (Mumford, 1906) who emphasized that leadership permeates all forms of association, from the simplest communities to the most complex organizations, thereby underscoring its ubiquity and significance. The universality of leadership is also reflected in the views of contemporary authors (Northouse, 2021; Yukl & Gardner, 2020), who highlight its key role in the professional development of an individual and improvement of organizational effectiveness. In present-day society, characterized by rapid changes and the need for adaptation, employers increasingly recognize leadership skills as key determinants of individual competitiveness in the labor market (Cottrell, 2021). In this regard, a growing body of research points to the significance and necessity of developing leadership skills through formal educational programs, which would enable young people to successfully integrate into dynamic professional environments (Dugan et al., 2009; Elmuti et al., 2005; Kezar et al., 2006). Nevertheless, formal education still does not provide a consistent and systematic integration of leadership (Cottrell, 2021). Some authors note that leadership is becoming more present in the programs of institutions of higher education, but is often treated as an addition to the curriculum rather than its integral part (Elmuti et al., 2005). Such approach leads to unsystematic development of leadership skills, which may reduce their applicability in a professional context (Dugan, 2024).

The issue of developing leadership skills through formal education is particularly significant in professions that involve high levels of responsibility and interaction with diverse stakeholders, among which the profession of a pedagogue occupies an important place. Given that pedagogues play a key role in shaping the formative and educational process, their leadership is not merely a matter of personal competence, but also a factor that influences the broader educational community. In this context, it is necessary to reconsider how the development of leadership skills can be systematically integrated into the formal education of future pedagogues.

Contemporary theories emphasize that leadership is not exclusively tied to formal positions of power, but rather encompasses a range of interpersonal characteristics and ethical values (Brown et al., 2005; Tannenbaum et al., 2013). Accordingly, Vann (Vann, 2000), whose concept of leadership served as the theoretical framework for this study, conceptualizes leadership as a dynamic and multidimensional process of developing students' personal and professional capacities. This model involves cultivating a set of interconnected characteristics: awareness of diversity, self-confidence, interpersonal communication, organization and planning, self-management, critical thinking, problem-solving and decision-making, as well as competence in the use of modern technology. According to Vann (Vann, 2000), leadership skills are seen as potentials that can be shaped through experience and educational programs. Such an understanding corresponds to contemporary pedagogical tendencies that aim at fostering the holistic development of individuals – leaders who think critically, communicate effectively, and act responsibly within complex social contexts. In contrast to dominant leadership models, such as transformational or transactional approaches, which primarily focus on the leader's role in organizational

settings as well as on their influence on followers (Northouse, 2021), Vann's model is particularly suitable for educational contexts, as it is grounded in the developmental potentials of students as future professionals. Unlike distributed leadership, which emphasizes the allocation of leadership roles within systems (Spillane, 2006), Vann focuses on the internal development of an individual and the acquisition of skills relevant to academic and professional success (Vann, 2000). This developmental orientation and functionality within the context of higher education represent the key reasons for selecting Vann's model as the theoretical framework of this study.

The importance of leadership skills for the pedagogue's profession is reflected in their direct connection with the quality of professional practice and the ability to coordinate the complex formative and educational process. As some authors emphasize (Brown et al., 2005), the ethical dimension of leadership implies responsible decision-making and the alignment of personal values with professional norms, which is particularly important in the work of pedagogues. The contemporary pedagogue functions not only as a professional advisor, but also as a leader who influences relationship-building and the organizational culture within the school (Tannenbaum et al., 2013). In addition to theoretical and methodological knowledge, pedagogues must possess well-developed skills of self-management, communication, and planning, as these enable effective guidance of others and the improvement of the quality of the formative and educational process (Harris & Jones, 2019). Particularly important are skills related to problem-solving, critical thinking, and respect for diversity, as they enable constructive responses in complex and unpredictable situations (Komives et al., 2013). In this sense, leadership skills represent an indicator of professional maturity and readiness for independent and responsible acting in practice. Vann (Vann, 2000) emphasizes that they are developed through experience, reflection, and educational programs, and that they are measurable and subject to systematic improvement.

Analyzing the ways in which these skills can be developed during one's studies, as well as the factors that influence them, is of essential importance for understanding the quality of education of future pedagogues. This results in the need to empirically examine their relationship with the academic achievement of pedagogy students, which represents the primary aim of this paper. Additionally, differences in the development of leadership skills are examined depending on the year of study. In this context, the study is directed toward answering the questions of whether, and to what extent, leadership skills are related to the academic success of pedagogy students, and whether, and to what extent, academic progress contributes to their development. Based on the obtained results and relevant literature, the study aims to formulate recommendations for such curriculum enhancement that could contribute to a more effective development of leadership skills within the framework of the formal education of future pedagogues.

Review of Relevant Research

Although research on students' leadership skills is relatively rare, there are studies that emphasize their importance in the context of professional preparation. One such study, conducted among social work students in Ukraine, showed that graduate students possess a higher level of developed leadership skills compared to undergraduate stu-

dents (Horishna et al., 2019). Furthermore, the same study found that students who were engaged in additional academic activities and who had work experience demonstrated more developed leadership skills compared to students who were not actively involved in extracurricular or work activities (Horishna et al., 2019). These findings suggest that different forms of practical engagement may have a positive impact on the development of leadership skills among students.

Research further indicates the existence of a positive relationship between students' engagement in leadership roles and their academic success (Bakar et al., 2018; Cheong, 2020). Participation in leadership roles contributes to the development of motivation, responsibility, and self-confidence, which in turn is reflected in improved academic achievement (Bakar et al., 2018; Baker & McCarthy, 2019). Self-confidence as a predictor of academic success is also reported in other studies (Morony et al., 2013). Furthermore, students who assume leadership roles often establish stronger relationships with their teachers and peers, thereby gaining easier access to additional support and resources, which may contribute to their learning success (Cheong, 2020). Findings from another study (Abbas et al., 2024) indicate that students' engagement in leadership roles positively influences their academic success. Students who take on leadership responsibilities demonstrate a higher level of skills which are characteristic of leadership, such as time management, effective communication, critical thinking, and teamwork, which are simultaneously identified as key predictors of academic achievement (Abbas et al., 2024).

Similarly, El Morabit (El Morabit, 2024) emphasizes that students who occupy leadership positions develop more pronounced skills in teamwork, problem-solving, and effective communication, as well as greater self-confidence. Participation in such activities contributes to positive dynamics among students, fosters personal development, and has a favorable impact on academic success. Other authors (Deng et al., 2020) also note that students' leadership experience can enhance academic achievement, with less time investment in studying, but a greater degree of autonomy and self-directed learning. Students with pronounced leadership characteristics have more self-confidence, show greater persistence, and achieve better academic results. Taking on leadership roles provides students with the opportunity to make independent decisions, build networks, and expand professional relationships, which further contributes to consistency in their studies and persistence in achieving their academic goals.

However, some studies point to different findings. The study by Pansacala and associates (Pansacala et al., 2024) did not show a statistically significant relationship between leadership and academic achievement. The authors, however, emphasize that the type of leadership position and the degree of responsibility it entails can significantly affect academic success, suggesting that the leadership role itself is not decisive; its quality and content must also be taken into account. Similarly, Chan (Chan, 2023) found no significant differences in academic performance among students with transformational, transactional, and passiveavoidant leadership styles, which further indicates the complexity of the relationship between leadership characteristics and academic outcomes. Additionally, findings from Gannouni and Ramboarison Lalao (Gannouni & Ramboarison-Lalao, 2016) indicate that, although there is no direct correlation between leadership and academic results, participation in leadership activities can contribute to the development of internal

psychological resources, such as selfconfidence and motivation, that give students the inner strength to persist, pursue ambitious goals, and achieve them successfully, which can indirectly affect their academic success. These findings underscore that leadership roles have significant developmental potential, even when they do not directly lead to improvements in academic achievement.

Although most of the cited studies indicate a positive association between leadership skills, leadership engagement, and students' academic achievement, findings in this area are not entirely consistent. While some studies emphasize the direct impact of leadership roles and related skills on academic success, other research points to the mediating role of psychological resources or to the importance of context, the type of leadership role, and the degree of responsibility it entails. Such an inconsistency in results highlights the complexity of the relationship between leadership skills and academic success, as well as the need for further empirical investigations in specific educational contexts. There is a particularly noticeable lack of research focused on pedagogy students, for whom the development of leadership skills is especially important both in terms of academic achievement and in preparation for their future professional role. It is precisely this research gap that constitutes the starting point and justification for conducting the study presented in this paper.

Methodological Framework of the Study

Study Aim

The aim of this study is to examine the relationship between leadership skills and academic achievement among pedagogy students, with the intention of providing a basis for leadership development within initial education programs for professional associates - pedagogues. In addition, attention is also devoted to analyzing differences in the development of leadership skills among students in different years of study, thereby examining the impact of academic progression on these skills. Given the theoretical foundations of the study, it is assumed that the results will indicate a positive association between leadership skills and academic achievement among pedagogy students. It is also expected that students in higher years of study will demonstrate a higher level of leadership skill development due to accumulated educational experience.

Variables and Instruments

Leadership skills were operationalized via a set of variables specified within a modified version of the *Student Leadership Outcomes Inventory* (SLOI) by Vann (Vann, 2000). The instrument comprises eight variables covering: awareness of diversity – understanding and respecting cultural and social differences; selfconfidence – trust in one's own leadership tendencies; interpersonal communication – skills for clear and effective communication with others; organization and planning – taskorganization and strategic planning skills; selfmanagement – selforganization and selfleadership skills in complex situations; cognitive development and critical analysis – critical thinking and problemanalysis skills;

problem solving and decision making – effective problem solving and strategic decision making; and use of technology – application of modern technology in leadership. The modification of the instrument included linguistic and cultural adaptation, as well as a reduction in the number of items compared to the original version, while retaining the key dimensions and the original conceptual structure of the instrument (Letić Lungulov i Radujkov, 2024; Vann, 2000). The modified version of the instrument was constructed as a Likerttype scale, consisting of 30 items with four response levels. Respondents indicate the extent to which each statement applies to them by circling a numeric value on the scale (from 1 = strongly disagree to 4 = strongly agree). Through exploratory factor analysis (principal axis factoring), the latent structure of the Students Leadership Outcomes Inventory questionnaire was examined and confirmed as an eightfactor model, consistent with the original study (Vann, 2000), while demonstrating satisfactory reliability and validity of the instrument. *Cronbach's alpha* for the overall instrument is .86, while the reliabilities of the individual domains range from .61 to .75 (Letić Lungulov i Radujkov, 2024).

Academic achievement was expressed as the grade point average over the study period up to the time of data collection.

Year of study includes four categories: first, second, third, and fourth year.

Sample

The study included 194 respondents enrolled in pedagogy studies at the Faculty of Philosophy, University of Novi Sad. The sample was a convenience sample and it included undergraduate pedagogy students. The sample structure and its uniformity with respect to relevant variables are shown in Table 1.

Table 1
Sample structure

Variables		Frequences	Percentage
Grade point average	6.50 – 7.50	16	8.2
	7.50 – 8.50	91	46.9
	8.50 – 9.50	76	39.2
	> 9.50	11	5.7
Year of study	First	49	25.2
	Second	45	23.2
	Third	50	25.8
	Fourth	50	25.8
	Total	194	100.0

Given that the sample consists of respondents from a single faculty in the country, the findings primarily reflect the characteristics of this group, while the applicability of the results to pedagogy students at other faculties could be the subject of future research.

By analyzing the study's ethical aspects, it was established that it in no way violates participants' rights nor departs from established ethical standards. Supporting this are the facts that the study included a relatively small number of questions concerning respondents' general characteristics, and that participation was entirely voluntary with the option to withdraw at any time. Accordingly, it was assessed that the study does not involve any risk to the psychological wellbeing of the respondents.

Results of the Study

Relationship Between Leadership Skills and Academic Achievement

Pearson's linear correlation coefficient was applied to examine the relationship between leadership skills and respondents' academic achievement.

Table 2
Correlation between leadership skills and academic achievement

Scale		Average
Student Leadership Outcomes Inventory	Total	.17*
	Organization and planning	.18*
	Awareness of diversity	.15*
	Selfmanagement	.15*
	Selfconfidence	.15*
	Use of technology	.01
	Cognitive development and critical analysis	.07
	Interpersonal communication	.12
	Problem solving and decision making	.05

Note. ***p < .001; **p < .01; *p < .05.

As shown in Table 2, students' grade point average is in a statistically significant positive correlation with the total score on the Student Leadership Outcomes Inventory, as well as with the first four subscales: organization and planning, awareness of diversity, selfmanagement, and selfconfidence. The correlations are low in intensity and positive in direction, indicating that higher scores on one variable are accompanied by higher values on the other. In other words, respondents with higher mean grades also exhibit more developed leadership skills in the aforementioned domains. Although these correlations are statistically significant, their low intensity points to limited practical significance of the effect, implying that students' academic success is simultaneously shaped by a broader set of individual and contextual factors.

Generational Differences in the Level of Leadership Skill Development

The results of the one-way analysis of variance showed that there are no statistically significant differences in the overall score on the *Student Leadership Outcomes Inventory* among students from different years of study. As presented in Table 3, the differences are not significant on the individual subscales of the instrument either ($p > .05$). In other words, first-, second-, third-, and fourth-year students do not differ significantly in the level of leadership skill development.

Table 3
Differences in leadership skills by year of study

	Year of study	*M*	*SD*	*F*	*df*	*p* - value
Total	First	99.91	9.94	.39	3(191)	.75
	Second	101.07	10.62			
	Third	99.54	11.98			
	Fourth	101.48	8.24			
Organization and planning	First	3.40	.43	2.05	3(191)	.10
	Second	3.47	.39			
	Third	3.25	.52			
	Fourth	3.33	.41			
Awareness of diversity	First	3.65	.47	2.38	3(191)	.07
	Second	3.84	.31			
	Third	3.82	.43			
	Fourth	3.80	.24			
Selfmanagement	First	3.35	.50	.93	3(191)	.42
	Second	3.35	.48			
	Third	3.20	.54			
	Fourth	3.32	.45			
Selfconfidence	First	3.22	.54	.19	3(191)	.94
	Second	3.14	.55			
	Third	3.21	.54			
	Fourth	3.20	.55			
Use of technology	First	3.17	.70	.74	3(191)	.52
	Second	3.34	.54			
	Third	3.26	.63			
	Fourth	3.30	.50			
Cognitive development and critical analysis	First	3.52	.47	1.40	3(191)	.24
	Second	3.63	.38			
	Third	3.46	.51			
	Fourth	3.47	.32			

	Year of study	*M*	*SD*	*F*	*df*	*p* - value
Interpersonal communication	First	2.93	.72	2.14	3(191)	.09
	Second	3.01	.78			
	Third	2.88	.75			
	Fourth	3.22	.58			
Problem solving and decision making	First	3.38	.48	2.45	3(191)	.06
	Second	3.53	.53			
	Third	3.59	.55			
	Fourth	3.64	.39			

Note. M – arithmetic mean; *SD* – standard deviation; *F* – ANOVA test value; *df* – degrees of freedom; *p*-value – level of statistical significance.

Such a finding indicates that the level of leadership skills does not change significantly during the studies, which may be an indicator of insufficient systemic support for their development in higher education. The obtained results thereby confirm the findings of other authors who emphasize that leadership, although recognized as an important component of academic and professional success, has not yet been adequately integrated into curricula (Cottrell, 2021). Therefore, in future curriculum development it would be important to include innovative approaches that foster the development of leadership skills.

Discussion

The results of the conducted research provide a deeper understanding of the relationship between leadership skills and the academic achievement of pedagogy students, as well as the ways in which these skills are formed within university education. The obtained data offer a basis for reflecting on the quality of the curriculum and its contribution to the development of the professional competencies of future pedagogues. The following discussion is directed toward interpreting the key findings, comparing them with relevant research, and identifying possible directions for improving the pedagogy curriculum with the aim of strengthening students' leadership potential.

The results of the study show that those dimensions of leadership related to self-regulation, organization, and personal efficacy – specifically organization and planning, awareness of diversity, self-management, and self-confidence – are significantly associated with students' academic achievement. Although these correlations are low in magnitude, their positive direction indicates that students with higher grade point averages simultaneously demonstrate more developed forms of self-directed behavior, better time management, and greater belief in their own abilities. Such findings suggest that academically more successful students are more likely to possess the ability to set realistic goals and plan their attainment. At the same time, they reflect on their own progress and adjust their learning strategies, which represent essential elements of leadership practice (Abbas et al., 2024; Baker & McCarthy, 2019; Komarraju & Nadler, 2013). Particularly noteworthy is

the finding that awareness of diversity emerged as a significant factor of academic success, encompassing openness to different opinions, respect for cultural, social, and individual differences, and the ability to understand others (Denson & Chang, 2009). This skill has a distinctly developmental and reflective function: it contributes not only to the quality of interpersonal relationships but also to students' ability to critically examine their own values, attitudes, and actions. Research shows that high awareness of diversity is associated with greater academic engagement and higher levels of metacognitive learning (Gurin et al., 2002). This correlation is linked to the development of intellectual flexibility, tolerance for ambiguity, and self-reflection. In this sense, a more developed awareness of diversity may indirectly contribute to academic success through the enhancement of socio-emotional and reflective aspects of learning, which are integral to self-regulatory functioning. Such a finding is consistent with previous research, which confirms that self-regulation, the ability to plan, and self-assessment of competencies constitute key predictors of academic success (Al-Abyadh & Abdel Azeem, 2022; Komarraju & Nadler, 2013). Studies also indicate that self-confidence, as the central component of self-evaluation, influences goal setting and motivation for learning, thereby affecting academic achievement (Stankov et al., 2013). In this respect, leadership dimensions of an intrapersonal nature – such as self-confidence, self-management, and organization – may act as mediators between motivational and cognitive processes in learning, which explains their stronger association with academic achievement compared to interpersonal dimensions.

On the other hand, the dimensions related to interpersonal communication, use of technology, and problem solving did not show a statistically significant association with students' grade point average. A possible explanation lies in the fact that these skills are not directly reflected in formal academic indicators, such as grades, but rather contribute to the development of broader social and professional capacities (Chan, 2023). For example, although communication skills are essential for teamwork and collaboration, they are often not subject to explicit evaluation in the academic context, while skills related to problem solving and the use of technology are more frequently manifested in practical and project-oriented forms of work, that are not included in traditional metrics of academic success. Similarly, Pansacala and associates (Pansacala et al., 2024) emphasize that the quality of the leadership role and the degree of responsibility may be more important than the mere frequency of assuming leadership activities, which further confirms the complexity of the relationship between leadership and academic dimensions of student functioning.

Overall, the results of this study confirm that the intrapersonal dimensions of leadership show a stronger association with academic achievement than the interpersonal dimensions. This relationship can be understood in the context of the specific nature of the academic environment, where success depends more on individual aspects than on social aspects of leadership practice. Intrapersonal skills act as internal mechanisms of self-regulating learning, enabling students to organize their academic responsibilities more efficiently, maintain continuity in their studies, and adapt their study strategies to the demands of the instructional process. By contrast, interpersonal dimensions of leadership fully manifest primarily in professional contexts that involve

interaction, joint decision making, and shared responsibility within a group, which are not always directly reflected in formal academic indicators of success. Thus, the stronger link between intrapersonal leadership skills and students' academic achievement is consistent with the structure and evaluation criteria of higher education. This implies that the development of self-regulatory, reflective, and organizational competencies should occupy a central place in initial education programs for future pedagogues. Introducing educational approaches that foster autonomy, self-assessment, and responsibility for learning can contribute to the concurrent development of leadership potential and academic effectiveness.

The findings also indicate that the level of leadership skill development among pedagogy students does not differ significantly across years of study, suggesting an absence of progressive development of these skills during academic training. This result can be interpreted as reflecting the fact that undergraduate pedagogy programs still lack sufficient elements that would systematically promote the development of leadership capacities. Although certain courses, projects, and forms of instructions implicitly foster collaboration, organization, and responsibility, these activities are not sufficiently structured. Therefore, undergraduate programs do not lead to significant differences in leadership skill development between student cohorts. This finding corroborates observations by authors who emphasize that development of leadership skills in educational contexts is not a spontaneous process, but the outcome of deliberate curricular design and reflective, experiential learning (Komives et al., 2005; Northouse, 2021). According to the leadership identity development model (Komives et al., 2005), building leadership capacities requires a long-term process of self-discovery, interaction, and feedback, with reflection playing a key role in linking experience to awareness of one's leadership potential. If educational programs do not provide enough opportunities for such experiences, leadership remains a latent component of pedagogy students' professional identity rather than a formative one.

It is particularly noteworthy that the dimensions of organization and planning, awareness of diversity, self-management, and self-confidence showed association with academic achievement, even though their levels did not change over the course of study. This pattern may indicate that the mentioned skills are stable individual characteristics that contribute to academic success but are not further reinforced by the higher education environment. A similar interpretation is offered by authors who emphasize that the development in leadership skills in higher education is conditioned by contextual factors – the quality of instructions, a supportive climate, and opportunities for active student participation in shared decision making (Dugan & Komives, 2010; Guthrie & Jenkins, 2018). In this respect, the results invite a reappraisal of existing curricular solutions and suggest the need for a more systematic approach to developing the leadership skills of future pedagogues. Integrating elements such as service learning, team projects, case studies, and reflective journals could foster a deeper understanding of the pedagogue's leadership role as a facilitator of change. Such instructional methods enable students to connect theoretical knowledge with practical experience while cultivating the reflective capacity – ability to critically examine their own actions, values, and professional practice in the context of social relations and educational goals (Mezirow, 2000).

Concluding Considerations and Curricular Implications

Based on the study's findings, which indicate that certain leadership skills are significantly associated with academic achievement, while their development is limited during the course of study, there is a clear need to design and implement curricular interventions that would systematically promote the formation and strengthening of leadership competencies in future pedagogues. The first step involves integrating learning outcomes that explicitly encompass leadership dimensions, such as the ability to organize collaborative work, make decisions, assume responsibility, and engage in reflective self-management (Komives et al., 2006). These outcomes can be embedded within existing courses through the introduction of problembased tasks and team projects. A second type of intervention includes experiential and participatory learning methods, such as service learning, projectbased instructions, and peer mentoring, which allow students to develop and test their leadership capacities in reallife contexts (Guthrie & Jenkins, 2018). Within such activities, students assume diverse roles, learn to plan and coordinate, resolve conflicts, and evaluate collective outcomes; in this way leadership skills are transformed from individual traits into functional competencies. Reflective practice plays a particularly important role: through portfolios, reflective journals, and supervised discussions, students can identify their leadership style and its ethical foundations (Day et al., 2014). Such reflection fosters both selfawareness and awareness of diversity – understanding and valuing different perspectives, cultural and individual differences – which is especially important for the pedagogue profession. A third line of intervention concerns cultivating an institutional culture that values and recognizes student leadership by supporting student organizations, initiatives, and research projects in which students take responsibility for planning and implementing activities (Dugan & Komives, 2010). In this way, leadership is seen not as an individual attribute, but as a process of collective action and professional maturation within the academic community. All these interventions point to the need to understand leadership in the education of future pedagogues as a dynamic, developmental process that requires careful curricular planning, interaction between theory and practice, and ongoing reflection. Such an approach would better equip future pedagogues to recognize, steer, and inspire the development of potential in others.

Although the study provided relevant insights into the relationship between leadership skills and academic achievement among pedagogy students, several limitations, affecting the generalizability of the findings, should be noted. First, the sample of 194 participants included students from a single faculty, which limits representativeness and the ability to generalize the results to the broader population of pedagogy students in Serbia. Second, the instrument relied on selfassessment of leadership skills, introducing the risk of subjective bias and socially desirable responding (Podsakoff et al., 2003). Third, the transversal character of the study prevents any conclusions about causal relationships between academic success and leadership skill development. Finally, external factors that might influence leadership development, such as participation in extracurricular activities, internships, volunteering, or prior work experience, were not taken into account. Future research would benefit from employing a longitudinal design and combining quantitative and qualitative methods to enable a deeper understanding of how leadership skills develop over the course of study.

References

Abbas, S. G., Mahjabeen, A., Ayub, U., & Iqbal, A. (2024). Examining the Influence of Student Leadership Roles on Academic Performance in Secondary Schools. *Journal for Current Sign*, *2*(3), 148-162.

Al-Abyadh, M. H. A., & Abdel Azeem, H. A. H. (2022). Academic Achievement: Influences of University Students' Self-management and Perceived Self-efficacy. *Journal of Intelligence*, *10*(3), 55. https://doi.org/10.3390/jintelligence10030055

Bakar, N. A., Abdullah, M. R., & Yusof, N. (2018). Leadership Roles in Student Government and their Impact on GPA. *Journal of Educational Psychology*, *110*(3), 373-385.

Baker, S. B., & McCarthy, M. (2019). The Influence of Leadership Experiences on Academic Achievement. *Educational Psychology Review, 31*(1), 122.

Brown, M. E., Treviño, L. K., & Harrison, D. A. (2005). Ethical leadership: A social learning perspective for construct development and testing. *Organizational behavior and human decision processes*, *97*(2), 117-134. https://doi.org/10.1016/J.OBHDP.2005.03.002

Chan, I. L. (2023). *Effects of Student Leadership Style on Their Academic Performance* (Publication No. 4321) [Doctoral Dissertations, Liberty University]. https://digitalcommons.liberty.edu/doctoral/4231

Cheong, J. (2020). The Correlation between Student Leadership and Academic Motivation. *AsiaPacific Journal of Education, 40*(2), 178-190.

Cottrell, S. (2021). *Skills for Success: Personal Development and Employability* (4th ed.). Bloomsbury Publishing.

Day, D., Fleenor, J., Atwater, L., Sturm, R., & Mckee, R. (2014). Advances in Leader and Leadership Development: A Review of 25 Years of Research and Theory. *The Leadership Quarterly*, *25*(1), 63-82. https://doi.org/10.1016/j.leaqua.2013.11.004

Deng, W., Li, X., Wu, H., & Xu, G. (2020). Student Leadership and Academic Performance. *China Economic Review, 60*, 101389. https://doi.org/10.1016/j.chieco.2019.101389

Denson, N., & Chang, M. J. (2009). Racial Diversity Matters: The Impact of Diversity-related Student Engagement and Institutional Context. *American Educational Research Journal, 46*(2), 322-353. https://doi.org/10.3102/0002831208323278

Dugan, J. P., Komives, S. R., & Segar, T. C. (2009). College Student Capacity for Socially Responsible Leadership: Understanding Norms and Influences of Race, Gender, and Sexual Orientation. *NASPA Journal*, *45*(4), 475-500. https://doi.org/10.2202/1949-6605.2008

Dugan, J. P., & Komives, S. R. (2010). Influences on College Students' Capacities for Socially Responsible Leadership. *Journal of College Student Development, 51*(5), 525-549. https://doi.org/10.1353/csd.2010.0009

Dugan, J. P. (2024). *Leadership Theory: Cultivating Critical Perspectives* (2nd ed.). John Wiley & Sons.

El Morabit, N. (2024). Navigating Leadership: Examining the Impact of Leadership Roles in School-Based Educational Clubs on Students' Development and Academic Performance. *Middle East Journal of Scientific Publishing*, 6(3), 473-495.

Elmuti, D., Minnis, W., & Abebe, M. (2005). Does Education Have a Role in Developing Leadership Skills? *Management Decision, 43*(7-8), 1018-1031. https://doi.org/10.1108/00251740510610017

Gannouni, K., & Ramboarison-Lalao, L. (2016). Leadership and Students' Academic Success: Mediating Effects of Self-efficacy and Self-determination. *International Journal of Leadership in Education*, *21*(1), 66-79. https://doi.org/10.1080/13603124.2015.1123300

Gurin, P., Dey, E. L., Hurtado, S., & Gurin, G. (2002). Diversity and Higher Education: Theory and Impact on Educational Outcomes. *Harvard Educational Review, 72*(3), 330-366. https://doi.org/10.17763/haer.72.3.01151786u134n051

Guthrie, K. L., & Jenkins, D. M. (2018). *The Role of Leadership Educators: Transforming Learning*. IAP.

Harris, A., & Jones, M. (2019). Teacher Leadership and Educational Change. *School leadership & management*, *39*(2), 123-126. https://doi.org/10.1080/13632434.2019.1574964

Horishna, N., Slozanska, H., Soroka, O., & Romanovska, L. (2019). Exploring the Leadership Skills of Pre-service Social Work Students: Implications for Social Work Education. *Problems of Education in the 21st Century*, *77*(5), 598-615. https://doi.org/10.33225/PEC/19.77.598

Kezar, A., Carducci, R., & Contreras-McGavin, M. (2006). *Rethinking the "L" Word in Higher Education: The Revolution of Research on Leadership. ASHE Higher Education Report, 31*(6). Jossey-Bass.

Komarraju, M., & Nadler, D. (2013). Self-Efficacy and Academic Achievement: Why Do Implicit Beliefs, Goals, and Effort Regulation Matter? *Learning and Individual Differences, 25*, 67-72. http://doi.org/10.1016/j.lindif.2013.01.005

Komives, S. R., Owen, J. E., Longerbeam, S. D., Mainella, F. C., & Osteen, L. (2005). Developing a Leadership Identity: A Grounded Theory. *Journal of College Student Development, 46*(6), 593-611. https://doi.org/10.1353/csd.2005.0061

Komives, S. R., Longerbeam, S. D., Owen, J. E., Mainella, F. C., & Osteen, L. (2006). A Leadership Identity Development Model: Applications from a Grounded Theory. *Journal of College Student Development, 47*(4), 401-418. https://doi.org/10.1353/csd.2006.0048

Komives, S. R., Lucas, N., & McMahon, T. R. (2013). *Exploring Leadership: For College Students Who Want to Make a Difference* (3rd ed.). Jossey-Bass.

Letić Lungulov, M., i Radujkov, S. (2024). Istraživanje liderskih veština budućih pedagoga: validacija inventara ishoda studentskog liderstva. *Inovacije u nastavi, 37*(3), 107-119. https://doi.org/10.5937/inovacije2403107L

Mezirow, J. (2000). Learning to Think like an Adult. Core Concepts of Transformation Theory. In J. Mezirow, & Associates (Eds.), *Learning as Transformation. Critical Perspectives on a Theory in Progress* (pp. 3-33). Jossey-Bass.

Morony, S., Kleitman, S., Lee, Y. P., & Stankov, L. (2013). Predicting Achievement: Confidence vs Self-efficacy, Anxiety, and Self-concept in Confucian and European Countries. *International Journal of Educational Research, 58*, 79-96. https://doi.org/10.1016/j.ijer.2012.11.002

Mumford, E. (1906). The Origins of Leadership. *American Journal of Sociology, 12*(2), 216-240. https://www.jstor.org/stable/2762385

Northouse, P. G. (2021). *Leadership: Theory and Practice* (9th ed.). SAGE Publications.

Pansacala, J. A. G. S., Napalla, E. R., & Tabaosares, C. M. (2024). The Relationship between Student Leadership and Academic Success. *International Journal of Science and Management Studies (IJSMS)*, *7*(6), 117-122. https://doi.org/10.51386/25815946/ijsms-v7i6p113

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology, 88*(5), 879-903. http://doi.org/10.1037/0021-9010.88.5.879

Spillane, J. P. (2006). *Distributed leadership.* Jossey-Bass.

Stankov, L., Morony, S., & Lee, Y. P. (2014). Confidence: the best non-cognitive predictor of academic achievement? *Educational Psychology, 34*(1), 9-28. http://doi.org/10.1080/01443410.2013.814194

Tannenbaum, R., Weschler, I., & Massarik, F. (2013). *Leadership and Organization (RLE: Organizations): A Behavioural Science Approach*. Routledge.

Vann, M. (2000). *Student Leadership Outcomes Inventory.* University Unions and Student Activities, Virginia Polytechnic Institute and State University.

Yukl, G. A., & Gardner, W. L. (2020). *Leadership in Organizations* (9th ed.). Pearson Education.

Article received: 14.10.2025.
Updated version received: 13.01.2026.
Accepted for publishing: 20.01.2026.

Milena Letić Lungulov
Department of Pedagogy, Faculty of Philosophy, University of Novi Sad, Novi Sad, Serbia
https://orcid.org/0000-0001-8666-5430

Jovana Turudić
Department of Pedagogy, Faculty of Philosophy, University of Novi Sad, Novi Sad, Serbia
https://orcid.org/0000-0001-5939-2238

Saška Radujkov
Department of Pedagogy, Faculty of Philosophy, University of Novi Sad, Novi Sad, Serbia
https://orcid.org/0009-0005-6308-9166

This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Studies in Teaching and Education, 2026, *75*(2), 487-501
https://doi.org/10.5937/niv75-60792

ISSN 0547-3330
eISSN 2560-3051
Original research paper

Digital Literacy and Digital Competence in EFL Teaching: Teachers' Perceptions and Pedagogical Realities

Maja Veljković Michos[1]
Singidunum University, Belgrade, Serbia
Valentina Bošković Marković
Singidunum University, Belgrade, Serbia
Sacmir Seferović
Sinergija University, Bijeljina, Bosnia and Herzegovina

Abstract *This study explores the role of digital literacy and digital competence in the teaching and learning of English as a Foreign Language (EFL), focusing on the effective integration of digital tools into pedagogical practices. It highlights two interrelated concepts: digital literacy, defined as the ability to access, evaluate, use, and create information via digital technologies; and digital competence, understood as a combination of cognitive, technical, and social skills necessary for meaningful participation in digital environments. Using a quantitative research design, the study investigates EFL teachers' self-perceived competencies, awareness, and attitudes toward digital literacy. An online questionnaire was administered to 139 EFL teachers from Serbia and Bosnia and Herzegovina, comprising Likert-scale, multiple-choice, and open-ended questions. The findings indicate that digital literacy and competence are recognized as a core component of language education. Participants reported high awareness of their pedagogical benefits, particularly in fostering learner autonomy and confidence. However, challenges persist, the most notable of which are unequal access to technology, digital safety concerns, and limited opportunities for specialized teacher training. While the results support both hypotheses, affirming educators' self-perceived digital literacy and competence and their educational relevance, the study underscores the need for targeted support to help language teachers apply digital tools effectively within the EFL classroom. The study offers insights into the successful integration of digital literacy and competence in language education, and urges sustained support in technology-enhanced teaching practices.*

Keywords: *digital literacy, digital competence, EFL teachers, language education, digital tools.*

Introduction

Digital literacy has become a key twenty-first-century skill, shaping the manners in which individuals access information, interact, and pursue lifelong learning (Spires et al.,

1 mveljkovic@singidunum.ac.rs

2018). In language teaching, it enhances learners' skills through digital tools and web resources. Defined as the ability to locate, organize, evaluate, understand, and create information using digital technologies (Reddy et al., 2020a), its growing relevance reflects concerns over data accessibility, online safety, and user-generated content (Mandić et al., 2024).

A concept which is closely linked is digital competence, which can be defined as the integration of cognitive, technical, and social skills for meaningful participation in digital environments (Reddy et al., 2020a; Reddy et al., 2020b). While digital literacy emphasizes critical engagement with information, digital competence highlights ethical and effective application. Zhang and Wu (Zhang & Wu, 2025) found that teachers with stronger digital skills improved lesson planning, engagement, and adaptability. Yet pedagogical integration of digital technologies remains uneven: a review of 24 EFL studies (Yalçin & Bozyiğit, 2023) stresses the need for targeted training. Regional studies echo this finding: Veljković Michos & Bošković Marković (Veljković Michos & Bošković Marković, 2020) reported that foreign language teachers value digital tools but face uneven support, while Gavranović & Veljković Michos (Gavranović & Veljković Michos, 2022) showed hybrid teaching fosters competence by requiring navigation of both physical and virtual contexts. Institutional initiatives, such as the University of Sarajevo platform (UNICEF, 2023) and Serbia's Digital Competence Framework (Ministry of Education, 2023), exemplify strategic efforts to strengthen teachers' pedagogical and technological preparation, aiming to embed digital tools into lesson planning, classroom interaction, and student achievement assessment.

Building on these pedagogical considerations, this study examines how digital literacy and competence are integrated into EFL teaching. It specifically explores teachers' use of digital technologies and their self-perceptions of digital skills. Guided by the research goals and prior literature, the study was framed by two hypotheses: (H1) EFL teachers perceive themselves as digitally literate and demonstrate digital competence using selected digital tools in their classrooms**;** and (H2) EFL teachers are aware of the relevance of digital literacy in contemporary education. The study employs a quantitative methodology to investigate the attitudes and experiences of 139 EFL teachers from Serbia and Bosnia and Herzegovina regarding the meaningful integration of digital tools in the classroom. By having its' findings situated within global and regional frameworks, this study deepens the understanding of the ways in which digital technologies shape language education in a specific context. It addresses challenges such as the digital divide, unequal access, data privacy, and inconsistent teacher training. By analyzing current practices and perceptions, the study shows how digital literacy and competence can be integrated into EFL teaching to foster learner autonomy and engagement.

Digital literacy and critical content evaluation

According to UNESCO, digital literacy is now an essential life skill which enhances employability and accelerates the acquisition of other competencies (Karpati, 2011). It comprises the ability to navigate digital environments safely and confidently. Furber (Furber, 2012) argued that students should be digitally literate by the end of compulsory education – that is to say, students should be able to create and edit text, images, audio,

and video; critically assess online information; use office software; and develop literacy through digital reading and writing. Although earlier frameworks (Brown et al., 2016; Furber, 2012) may seem dated, they remain valuable references to understanding the evolution of digital literacy and critical content evaluation.

Weisberg et al. (Weisberg et al., 2023) highlight critical thinking as central to how learners search, interpret, and assess information. In EFL contexts, Silvhiany et al. (Silvhiany et al., 2021) found that students often rely on superficial features of information sources rather than examining the authorship, intent, or evidence which the information is based upon. This underscores the need to equip learners with critical skills in order for them to become autonomous digital citizens. Table 1 presents the categories of digital literacy adapted from Brown et al. (Brown et al., 2016), which continue to present a significant information source for current research in this field.

Table 1
Key Concepts Summary (adapted from Brown et al., 2016)

	Information Literacy	Media Literacy	Computer Literacy	Digital Literacy
Definition	Ability to effectively locate, identify, retrieve, process, and utilize digital information (Karpati, 2011).	Ability to access, understand, analyze, and critically evaluate media content, and to create and communicate effectively across diverse platforms and contexts (EU Commission, 2018).	Basic understanding of computer systems and software; a set of essential competencies to engage meaningfully in a digitally mediated society, where services and resources are accessed and distributed online (Karpati, 2011).	Ability to use, evaluate, and integrate diverse digital resources within the context of lifelong learning, emphasizing critical assessment of digital content (Furber, 2012).

In addition to the foundational literacies, information, media, computer, and digital, recent perspectives introduce a fifth: AI literacy, defined as the ability to understand, evaluate, and ethically engage with artificial intelligence technologies (Ng et al., 2021; Su et al., 2023; UNESCO, 2024).

Recent perspectives on digital and AI literacy and competence

Recent studies on digital literacy (Nguyen & Habók, 2024; Sánchez-Cruzado et al., 2021) and digital competence (Basilotta-Gómez-Pablos et al., 2022; Guillén-Gámez et al., 2021) examine models for acquisition and assessment, underscoring the need for pedagogical updating among language teachers.

Basilotta-Gómez-Pablos et al. (Basilotta-Gómez-Pablos et al., 2022) define digital competence as the knowledge, skills, and attitudes needed for effective technology use in teaching. Their review of 56 studies shows that teachers often report low or medium-low competence, especially in student knowledge assessment. Gaps also exist between competence level and actual use of web tools, with age and gender influencing the level of digital skills (Guillén-Gámez, 2021). Sánchez-Cruzado et al. (Sánchez-Cruzado et al., 2021),

surveying 4,883 Spanish teachers, found similarly low self-perceptions and proposed a training plan based on the INTEF Joint Framework, using the ACDC tool. Nguyen and Habók (Nguyen & Habók, 2024), reviewing studies from 2011–2022, highlight research on educational technology's impact on teaching, learning, professional development of teachers, and student support. Current frameworks extend to AI, such as UNESCO's (2024) AI Competency Framework, which defines the knowledge, skills, and values teachers need for responsible use of artificial intelligence.

AI literacy has become a prominent dimension of digital literacy (Ng et al., 2021; Su et al., 2023). Its integration enables personalized learning through materials tailored to students' abilities and interests, while AI-supported feedback enhances engagement and motivation. At the same time, the growing presence of AI and robotics in education raises numerous pedagogical and ethical challenges (Mandić et al., 2024).

AI initiatives in preschool education are gaining increasing attention despite causing debates about their appropriateness (Su et al., 2022). Early exposure of children to AI literacy supports theory of mind, emotional awareness, creative inquiry, and collaboration (Černý, 2022). When digital literacy is fostered from childhood, learners are better prepared to use AI tools for personalized learning, automated feedback, and writing assistance through synthesis and idea generation (Mandić et al., 2024). Teachers also benefit from AI in administrative tasks such as grading, syllabus design, content creation, student work correction, and potential risk prediction (Galindo-Domínguez et al., 2024).

Global digitalization and regional perspectives

Global digitalization during COVID-19 accelerated the integration of digital tools across education. In Serbia, foreign language teaching adapted with minimal disruption, as platforms such as Google Meet, Microsoft Teams, Zoom, and Skype offered virtual experiences resembling traditional classrooms (Ilić & Bošković Marković, 2020; Veljković Michos & Bošković Marković, 2020). Effective use of these technologies depends on teachers' pedagogical evaluation, with digitally competent educators designing practices and outcomes regardless of students' technological proficiency (Veljković Michos & Bošković Marković, 2020).

Such teachers must also manage core tasks – reviewing homework, correcting papers, and creating online activities – while navigating digital platforms. Yet many lack formal training in designing and managing digital learning environments (Ristić, 2019). A study of 200 participants (100 students, 100 professors) confirmed that teachers' pedagogical and digital competencies are essential for sustaining student engagement and ensuring dynamic, meaningful content presentation (Veljković Michos et al., 2024).

Several official documents in Serbia define frameworks for teachers' digital competencies. The Ministry of Education adopted the Digital Competence Framework in 2017, revised in 2019, in order to guide effective teaching. Building on this, in 2022, the Institute for the Evaluation of Education Quality introduced the Instrument for Teachers' Digital Competence Self-Assessment. In 2023, Serbia launched the revised Digital Competence Framework – Teacher for the Digital Age, which covered skills such as managing digital

information, creating content, facilitating online collaboration, conducting digital assessments, and ensuring ethical use of technologies.

Aligning with international trends, Serbia has shown strategic commitment to integrating digital technologies into pedagogy. To standardize the implementation of digital technologies, Jokić et al. (Jokić et al., 2025) validated the reliability and structure of a revised assessment tool, confirming that teachers' digital competencies can be organized into distinct domains of digital practice. These efforts operationalize digital standards across Serbia's education system, reinforcing the relevance and applicability of the existing digital competence framework.

Similarly, the University of Sarajevo launched the DigiEdu platform with the aim to strengthen teachers' digital and pedagogical competencies in Bosnia and Herzegovina. It provides certified online courses, interactive workshops, and a growing resource repository, supported by UNICEF, USAID, and Erasmus+ (UNICEF, 2023). In the same context, Seferović (Seferović, 2023) examined digital literacy among EFL teachers in Bosnia and Serbia, emphasizing the role of digital tools as the impetus of critical thinking, active learner engagement and autonomous learning.

Research methodology

Following international standards, both Balkan countries foster teachers' digital competencies through national and institutional initiatives. This study adopts a quantitative approach with the aim to examine the role of digital literacy and competence in EFL teaching and the integration of digital tools into teaching process. Its objectives are to explore teachers' perceptions, attitudes, and experiences with digital technologies, assess their competencies, and evaluate their awareness of promoting digital literacy in language education. Two hypotheses guided the research: first, that EFL teachers possess adequate digital literacy to integrate digital tools effectively; and second, that they recognize the importance of digital literacy and competence in contemporary society.

Data Collection Instrument

The questionnaire was originally developed in 2023 as part of a master's thesis, with academic supervision and expert input from the authors. It was designed to examine digital literacy and self-assessed digital competence across instructional, communicative, and reflective domains among English teachers in Serbia and Bosnia and Herzegovina. The questionnaire was reused in this research, with minor adaptations for a broader comparative scope. The online Google survey, titled "EFL Teachers' Digital Literacy and Competence", included three sections: demographics (5 items), conceptual knowledge and self-assessment (10 items, Likert and multiple-choice), and pedagogical practices (7 items, multiple-choice, open-ended, and Likert).

A pilot study (*N*=30) confirmed the questionnaire reliability, with Likert-scale items showing strong internal consistency for measuring self-assessed digital competence and the awareness of digital literacy significance.

A total of 22 items were included in the final survey. The questionnaire was developed based on key theoretical frameworks, specifically integrating dimensions from the DigCompEdu (European Framework for the Digital Competence of Educators) and the local Digital Competence Framework – Teacher for the Digital Age (Ministry of Education, Science and Technological Development, 2023). An online anonymous questionnaire was designed and shared to 139 EFL teachers. The final sample included 86.3% female (*N*=120) and 13.7% male (*N*=19) respondents, with the majority aged between 31 and 50 years. Participants represented diverse institutional affiliations: 46.8% worked in primary education, 23% in secondary schools, 5.8% at universities, and 25.2% in private institutions; others worked online or freelance. Regarding teaching experience, 43.9% of the participants had over 13 years of service.

The collected data were analyzed to identify patterns in digital tool usage, self-perceived digital competence, and awareness of digital literacy's relevance. The methodology was designed to capture insights from active teachers with experience integrating digital practices into their instruction, while also highlighting perceived benefits and limitations of digital tools in teaching. This approach allowed the study to examine challenges such as the digital divide, unequal access to technology, digital safety concerns, and the need for regular, targeted teacher training to support more confident and innovative use of digital technologies in EFL contexts.

The questions included various formats. For instance, conceptual knowledge was assessed by a multiple-choice item asking, *'Which of the following best defines digital competence?';* self-perceived competence was measured using a 5-point Likert scale (1=I strongly disagree to 5=I strongly agree) for statements such as: *'I am confident in creating my own digital content for EFL lessons*'. Pedagogical practices included a multiple-choice item (Table 3) asking respondents to select the digital tools they use most frequently. This study employs two complementary concepts: digital literacy – the ability to access, evaluate, use, and create information through digital technologies – and digital competence – the technical, cognitive, and social skills needed for active participation in digital environments. Both concepts are considered essential for teachers' professional development.

Research results: interpretation and comparative insights

The first survey section covered demographics. The second assessed respondents' theoretical knowledge and familiarity with key terms. When asked to define digital literacy, 97.1% (*N*=135) chose "the ability to search, analyze, read, write, or interact in a digital environment," aligning with widely accepted views. Other answers included "playing online games," "accessing online information," and "creating digital content." These alternatives highlight the need for targeted professional development to clarify the role of digital literacy in instructional design and learner engagement.

Definitions of digital competence were more diverse. The most frequent choice, 62.6% (*N*=87), was "free and critical use of digital tools for business, leisure, and communication," followed by "ability to read, write, and use digital content" (24.5%, *N*=34).

Other responses reflected narrower understanding of the concept, such as gaming, access to information, or content creation. These results suggest that teachers partly recognize the extending of digital competence beyond technical skills to independent, responsible, and pedagogically supportive use of digital technologies (Reddy et al., 2020b; Zhang & Wu, 2025).

The findings also show overlap between digital literacy and competence, since both involve meaningful interaction in digital environments. Yet digital competence encompasses broader cognitive, social, and ethical skills, underscoring the need for clearer distinction of the two concepts in theory and practice. Most teachers self-identified as digitally literate, with only one respondent disagreeing, which indicated high confidence among EFL educators. However, self-perception may not align with pedagogical effectiveness. Institutional initiatives (UNICEF, 2023; Ministry of Education, 2023) are crucial to bridge this gap, while the DC4LT report (Fominykh et al., 2019) highlights aligning teacher competencies with employer expectations and policy frameworks in language education.

Table 2
EFL Teachers' Perceptions of Their Own Digital Literacy

Response Option	Count	Percentage
I am not at all digitally literate	1	.7%
I am not quite digitally literate	0	0%
I'm not sure	37	26.6%
I believe I am digitally literate	61	43.9%
I am completely digitally literate	40	28.8%

The third section examined how EFL teachers apply digital tools and competencies in practice. Respondents could select multiple options, including platforms, applications, websites, games, and quizzes. As shown in Table 3, the most frequently used tools were websites (68.3%), platforms (66.9%), quizzes (66.2%), and applications (54.7%), in accordance with broader trends favouring user-friendly resources (Hatlevik & Christophersen, 2013; Petko et al., 2018). However, game-based platforms such as *Bamboozle* and *Kahoot* were rarely used, which could suggest limited accessibility or teachers' preference for more traditional tools. Only two respondents reported using all listed tools, indicating selective and fragmented integration of digital technologies into teacher process. These findings highlight the need for professional development that expands digital tool variety and emphasizes pedagogical relevance for learner autonomy and formative assessment. The adoption and use of digital technologies are shaped by teacher confidence and institutional support. Similar gaps between digital tool availability and effective use (van der Vlies, 2020), and between tool familiarity and strategic integration into teaching (Zhang & Wu, 2025), further underscore the importance of targeted training.

Table 3
Which digital tools do you use most frequently in teaching (multiple answers possible)?

Category	Response Count	Percentage
Platforms	93	66.9%
Applications	76	54.7%
Websites	95	68.3%
Games	52	37.4%
Quizzes	92	66.2%
Multiple or all of the above	2	1.4%
Bamboozle, *Kahoot*, digital tools	1	.7%
Most frequently use video recordings	1	.7%
All	1	.7%

The survey examined teachers' participation in digital literacy training. Of 139 respondents, 35.3% (*N*=49) reported attending such programs, while 64.7% (*N*=90) had not. Those who participated listed diverse formats (Table 4), including Erasmus programs, institutional seminars, webinars, and university courses. These examples confirm that the opportunities exist, but participation may be limited by teacher awareness, scheduling limitations, institutional support, or personal motivation. Prior research shows that program availability alone is insufficient – promotion, relevance, and institutional encouragement are of crucial importance (Howard et al., 2020; Hennessy et al., 2021).

Despite many educators feeling confident with digital tools, the relatively low rate of formal training raises questions about how competencies were developed. Informal learning, peer collaboration, and self-directed engagement likely play a relevant role, especially when supported by psychological engagement and a reflection on one's own practice of gained competencies (Yan et al., 2025). Findings reveal that only 35.3% of teachers have engaged in structured training, while 64.7% have not. This suggests limited formal development but not necessarily lack of access to resources and learning opportunities.

Responses on training in digital competence and literacy revealed diverse formats of available programs: national seminars (Ministry of Education, 2017; 2019; 2023), university courses (Ristić, 2019), and international programs such as Erasmus and Cambridge workshops. This diversity reflects Europe's evolving landscape of teacher digital competence (European Commission, 2018; INTEF, 2017). Yet, the gap between training and classroom application echoes international findings: Nguyen & Habók (Nguyen & Habók, 2024) note that self-assessed literacy often stems from informal learning, while Hatlevik & Christophersen (Hatlevik & Christophersen, 2013) and Sánchez-Cruzado et al. (Sánchez-Cruza-

do et al., 2021) stress that sustained engagement of digital competencies requires pedagogical integration.

The results imply that, while teachers express confidence in own digital literacy, there is still a need for stronger alignment between educational policy, teacher practice, and professional development. A cohesive approach – grounded in Serbia's Digital Competence Framework (2023) and supported by empirical insights (Ilić & Bošković Marković, 2020; Seferović, 2023; Veljković Michos et al., 2024) – can help educators move from a simple use of digital tools to pedagogically based, critically assessed integration.

Teachers were also asked which digital competence should be emphasized as a separate formal subject. Of all respondents, 35.3% selected all listed options – creating digital content, strategies for effective information delivery, and digital literacy. These include skills such as content creation, online information evaluation, ethical participation in digital communication, and integration of multimodal resources, all closely tied to language teaching. Responses suggest that teachers view digital competencies as interconnected and essential to modern pedagogy.

Table 4
If you could choose, which listed option would you prefer to be a subject in your educational institution?

Competency	Percentage
Creating digital content	23.0%
Strategies for delivering effective information	26.6%
Digital literacy	(small segment)
All the above items are important and should be included in school or realized as additional classes	35.3%

Teachers identified areas of insufficient education within digital competence. As shown in Table 5, the most common response was digital security and protection (44.6%), followed by digital literacy (10.8%), while 35.3% felt adequately trained in all areas. These findings align with the Digital Competence Framework: Teacher for the Digital Age (2023), which includes domains such as information literacy, communication, content creation, problem-solving, and digital safety.

Although many teachers express confidence in general competence, security remains a weak point, echoing broader challenges in safe and ethically responsible digital engagement (Brown et al., 2016; Spires et al., 2018; Nguyen & Habók, 2024). Results suggest that targeted professional development in digital safety, digital ethics, and responsible use of technologies is essential. Besides, self-perceived competence does not always equal pedagogical readiness to apply digital technologies in teaching, especially in areas requiring a high level of psychological engagement, as well as institutional support and reflective practice (Yan et al., 2025).

Table 5
In which fields do you consider yourself insufficiently trained?

Field	Percentage
Digital Literacy	10.8%
Digital Security and Protection	44.6%
None of the Above	35.3%

The final section explored teachers' familiarity with digital storytelling, a method combining narrative and multimedia aiming to enhance EFL learners' phonology, grammar, and vocabulary through collaborative story creation (Al-Amri, 2020; Seferović, 2023). Over half of respondents (*N*=79) were unfamiliar with the term and do not use it in practice. Most of the teachers also lacked knowledge of tools designed for digital storytelling, indicating its' underrepresentation in professional development. These findings highlight the need for targeted training to support creative, learner-centered approaches.

Digital storytelling, as a multimodal strategy, can connect digital competence with innovative teaching, making instruction more inclusive and engaging. These findings confirm both of the study's hypotheses: first, that EFL teachers perceive themselves as digitally literate and competent in using selected tools; second, that they recognize the relevance of digital literacy in education. Yet certain gaps remain in training and familiarity with pedagogical strategies. Results across research sections emphasize the need for continuous, targeted teacher training – especially in specialized tools and strategies such as digital storytelling – to transform foundational skills into innovative, learner-centered practices. Such competencies enhance learner engagement, autonomy, and inclusivity in EFL instruction.

The following results confirm our two main hypotheses, which were based on high respondent agreement in the original frequency counts.

Table 6
Descriptive statistics and hypothesis testing

Construct (Variable)	*N*	Mean (*M*)	Standard Deviation (*SD*)	Interpretation
Self-Perception (Hypothesis 1)	139	4.00	.789	Confirmed: Mean is exactly 4.00 (agree) on the 5-point Likert scale.
Awareness of Relevance (Hypothesis 2)	139	4.331	1.066	Strongly Confirmed: Mean is well above 4.00 (agree), indicating high consensus on the need for development.

The overall mean score for teachers' self-assessment of their digital literacy was *M* = 4.00 (*SD* = 0.789) on a 5-point scale, aligning precisely with 'agree.' This result supports hypothesis 1, indicating that English language teachers generally perceive themselves as

digitally literate. There was very strong agreement regarding the statement on the necessity for further development of digital literacy and competencies across all student age groups ($M = 4.331$, $SD = 1.066$). This finding strongly supports hypothesis 2, highlighting a widespread recognition among educators of the growing importance of digital skills in modern pedagogical practice.

Additionally, an independent sample t-test was conducted to compare the self-perception of digital literacy between male ($M = 4.263$, $SD = .810$) and female ($M = 3.958$, $SD = .786$) teachers. The difference between the two groups was not statistically significant ($t(137) = 1.572$, $p = .118$). Although male teachers reported a slightly higher mean score, these results suggest that gender does not significantly predict self-perceived digital literacy in this sample.

We have also used one-way ANOVA to analyze teaching experience and self-perception among teachers, dividing them into four different categories (Table 7). According to these results, there is a marginally significant difference between the groups ($F(3.135) = 2.574$, $p = .057$). While not reaching the conventional threshold of statistical relevance ($p < .05$), the findings show a clear trend: the newest teachers (1 – 3 years) reported the highest self-perception ($M = 4.286$), and teachers in the 4–7 year bracket reported the lowest ($M = 3.727$). This suggests that the early career stage (4 – 7 years) may represent a period of re-evaluation or a more realistic assessment regarding own digital skills compared to the most inexperienced group.

Table 7
Self-perception across four different teacher categories

Experience Group	*N*	Mean (*M*)	Standard Deviation (*SD*)
1 - 3 years	28	4.286	.810
4 - 7 years	22	3.727	.827
8 - 12 years	28	4.107	.786
More than 13 years	61	3.918	.737
ANOVA Results		$F(3, 135) = 2.574$, $p = .057$	

Conclusion

This study reveals that EFL teachers in Serbia and Bosnia and Herzegovina generally perceive themselves as digitally literate and competent in using selected digital tools. This self-assessed competence is linked to increased autonomy and assurance in their teaching process. However, digital integration into teaching remains uneven: while platforms and quizzes are widely adopted, gamified tools like *Bamboozle* and *Kahoot* are underutilized, and the awareness of digital storytelling is limited. The most significant gap that's been reported relates to digital security and protection, with nearly half of the respondents feeling insufficiently trained.

These findings confirm the study's two hypotheses: teachers perceive themselves as digitally competent and recognize the relevance of digital literacy in education. Yet, the data also highlight a need for targeted professional development – particularly in areas that go beyond basic tool use and address ethical, safe, and pedagogically meaningful digital practices. Importantly, the study does not equate lack of training with lack of access; rather, it emphasizes the need for professional development that is visible, relevant, and contextually aligned. As outlined in the Digital Competence Framework: Teacher for the Digital Age (Ministry of Education, 2023), digital literacy should be understood as a cross-curricular competency encompassing information management, content creation, communication, collaboration, and digital safety – all highly relevant to EFL instruction. The study's strengths include its diverse sample and mixed-methods design, though limitations such as reliance on self-reported data and absence of classroom observation must be acknowledged.

Overall, the research affirms the growing importance of digital competence in modern language education and underscores the strategic role of national initiatives in supporting teacher readiness. By aligning institutional efforts with pedagogical research and international standards, this study contributes to a clearer understanding of how digital literacy is perceived and practiced – and where future professional development and educational policy efforts should be directed.

References

Al-Amri, H. M. (2020). Digital storytelling as a communicative language teaching-based method in EFL classrooms. *Arab World English Journal*, *11*(1), 270–281. https://doi.org/10.24093/awej/vol11no1.20

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L. A., & Otto, A. (2022). Teachers' digital competencies in higher education: a systematic literature review. *International journal of educational technology in higher education*, *19*(8), 1-16. https://doi.org/10.1186/s41239-021-00312-8

Brown, C., Czerniewicz, L., Huang, C.-W., & Mayisela, T. (2016). *Curriculum for Digital Education Leadership: A Concept Paper.* Commonwealth of Learning. https://oasis.col.org/items/7795e33d-b199-4913-afcb-dd1874f70b01

European Commission. (2018). *Key competencies for lifelong learning*. https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en

Fominykh, M., Didkovsky, M., Economides, A., Giordano, A., Ivanova, K., Kakoulli-Constantinou, E., Khuzina, M., Menis, E., Nicolaou, A., Parmaxi, A., Perifanou, M., Shikhova, E., Soule, M. V., Talmo, T., Windstein, E., & Zhukova, D. (2019). Digital competences in language education: Teachers' perspectives, employers' expectations, and policy reflections (Technical Report). DC4LT Consortium. https://doi.org/10.13140/RG.2.2.24392.65285

Furber, S. (2012). *Shut down or restart? The way forward for computing in UK Schools*. The Royal Society.

Galindo-Domínguez, H., Delgado, N., Losada, D., & Etxabe, J. M. (2024). An analysis of the use of artificial intelligence in education in Spain: The in-service teacher's perspective. *Journal of digital learning in teacher education*, *40*(1), 41–56. https://doi.org/10.1080/21532974.2023.2284726

Gavranović, V., & Veljković Michos, M. (2022). *Integrating ICT in Language Teaching and Learning. A Guide to Hybrid Teaching*. Singidunum University.

Guillén-Gámez, F. D., Mayorga-Fernández, M. J., Bravo-Agapito, J., & Escribano-Ortiz, D. (2021). Analysis of teachers' pedagogical digital competence: Identification of factors predicting their acquisition. *Technology, Knowledge and Learning*, *26*(3), 481–498. https://doi.org/10.1007/s10758-019-09432-7

Hatlevik, O. E., & Christophersen, K. A. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & education*, *63*, 240–247. https://doi.org/10.1016/j.compedu.2012.11.015

Hennessy, S., D'Angelo, S., McIntyre, N., Koomar, S., Kreimeia, A., Cao, L., Brugha, M., & Zubairi, A. (2021). *Technology, Teacher Professional Development and Low- and Middle-Income Countries: Technical report on systematic mapping review* [Technical Report]. EdTech Hub. https://doi.org/10.53832/edtechhub.0047

Howard, S. K., Tondeur, J., Siddiq, F., & Scherer, R. (2020). Ready, set, go! Profiling teachers' readiness for online teaching in secondary education. *Technology, Pedagogy and Education*, *30*(1), 141–158. https://doi.org/10.1080/1475939X.2020.1839543

Ilić, D., & Bošković Marković, V. (2020). Teaching in Online Classroom from the Perspective of English Language Teachers. *Primenjena lingvistika*, *21*, 25–44. https://doi.org/10.18485/primling.2020.21.2

Instituto Nacional de Tecnologías Educativas y Formación del Profesorado (INTEF). (2017). *Marco Común de Competencia Digital Docente*. Ministerio de Educación, Cultura y Deporte & Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado. https://bit.ly/2jqkssz

Jokić, S., Marić Jurišin, S., & Perić-Prkosovački, B. (2025). Verification of metric characteristics of the questionnaire "Framework for Digital Competence – Teacher for the Digital Age". *Education and Information Technologies*, *30*(16), 23577-23598. https://doi.org/10.1007/s10639-024-13288-5

Karpati, A. (2011). *Digital literacy in education: Content, Structure, and Development*. UNESCO Institute for Information Technologies in Education. https://coilink.org/20.500.12592/73k74v

Mandić, D., Mišcević, G., Babić, J., & Matović, S. (2024). Educational Robots in Teachers' Education. *Research in Pedagogy*, *14*(2), 361–376. https://doi.org/10.5937/IstrPed2402361M

Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. (2017). *Okvir digitalnih kompetencija — Nastavnik za digitalno doba*.

Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. (2019). *Okvir digitalnih kompetencija — Nastavnik za digitalno doba*.

Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. (2023). *Okvir digitalnih kompetencija — Nastavnik za digitalno doba*. Zavod za vrednovanje kvaliteta obrazovanja i vaspitanja. https://ceo.edu.rs/okvir-digitalnih-kompetencija-2023/

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). AI literacy: Definition, teaching, evaluation, and ethical issues. *Proceedings of the Association for Information Science and Technology*, *58*(1), 504-509. https://doi.org/10.1002/pra2.487

Nguyen, L. A. T., & Habók, A. (2024). Tools for assessing teacher digital literacy: a review. *Journal of Computers in Education*, *11*(1), 305–346. https://doi.org/10.1007/s40692-022-00257-5

Petko, D., Prasse, D., & Cantieni, A. (2018). The interplay of school readiness and teacher readiness for educational technology integration: A structural equation model. *Computers in the Schools*, *35*(1), 1–18. https://doi.org/10.1080/07380569.2018.1428007

Reddy, P., Sharma, B., & Chaudhary, K. (2020a). Digital literacy: A review of literature. *International Journal of Technoethics (IJT)*, *11*(2), 65–94. https://doi.org/10.4018/IJT.20200701.oa1

Reddy, P., Sharma, B., & Chaudhary, K. (2020b). Measuring the digital competency of freshmen at a higher education institute. *Proceedings of the 24th Pacific Asia Conference on Information Systems (PACIS 2020)* (Article 6). Association for Information Systems. https://aisel.aisnet.org/pacis2020/6

Ristić, M. (2019). Model digitalnog nastavnog okruženja za strani jezik struke. *Inovacije u nastavi*, *32*(2), 106–121. https://doi.org/10.5937/inovacije1902106R

Sánchez-Cruzado, C., Santiago Campión, R., & Sánchez-Compaña, M. T. (2021). Teacher digital literacy: The indisputable challenge after COVID-19. *Sustainability*, *13*(4), 1858. https://doi.org/10.3390/su13041858

Seferović, S. (2023). *Digital literacy in the English language learning process: Helping tools for promoting digital literacy* (Master's thesis). Sinergija University.

Silvhiany, S., Huzaifah, S., & Ismet, I. (2021). Critical digital literacy: EFL students' ability to evaluate online sources. *Indonesian Journal of EFL and Linguistics*, *6*(1), 249-269. https://doi.org/10.21462/ijefl.v6i1.364

Spires, H. A., Paul, C. M., & Kerkhoff, S. N. (2018). Digital literacy for the 21st century. In M. Khosrow-Pour (Ed.), *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 2235–2242). IGI Global Scientific Publishing. https://doi.org/10.4018/978-1-5225-7659-4.ch002

Su, J., & Yang, W. (2022). Artificial Intelligence in Early Childhood Education: A Scoping Review. *Computers and Education: Artificial Intelligence*, *3*, 1-13. https://doi.org/10.1016/j.caeai.2022.100049

Su, J., D. T. K., Ng, & Chu, S. K. W. (2023). Artificial Intelligence (AI) Literacy in Early Childhood Education: The Challenges and Opportunities. *Computers and Education: Artificial Intelligence*, *4*(1), 1-14. https://doi.org/10.1016/j.caeai.2023.100124

UNESCO. (2024). *AI competency framework for teachers*. https://unesdoc.unesco.org/ark:/48223/pf0000391104

UNICEF. (2023). *University of Sarajevo launching a platform to improve the digital and pedagogical competencies of teachers*. https://www.unicef.org/bih/en/press-releases/university-sarajevo-launching-platform-improve-digital-and-pedagogical-competencies

van der Vlies, R. (2020). *Digital strategies in education across OECD countries: Exploring education policies on digital technologies (OECD Education Working Papers No. 226)*. OECD Publishing. https://doi.org/10.1787/33dd4c26-en

Veljković Michos, M., & Bošković Marković, V. (2020). Teachers' perception of the use of ICT in foreign language teaching at a higher education institution. *Sinteza 2020 - International Scientific Conference on Information Technology and Data Related Research* (pp. 93–98). Singidunum University. https://doi.org/10.15308/Sinteza-2020-93-98

Veljković Michos, M., Pupovac, M., Lunić, D., Nikolić, J., & Čolović, M. (2024). The Effectiveness of Presentations in Higher Education: Teacher and Student Perspectives. *Sinteza 2024 - International Scientific Conference on Information Technology, Computer Science, and Data Science* (pp. 316-321). Singidunum University. https://doi.org/10.15308/Sinteza-2024-316-321

Weisberg, L., Wang, X., Wusylko, C., & Kohnen, A. (2023). Critical Online Information Evaluation (COIE): A comprehensive model for curriculum and assessment design. *Journal of Media Literacy Education*, *15*(1), 14–30. https://doi.org/10.23860/JMLE-2023-15-1-2

Yalçin, T., & Bozyiğit, E. (2023). A review of studies on digital competence in teaching English as a foreign language. *Studies in Linguistics, Culture, and FLT*, *11*(3), 82-101. https://doi.org/10.46687/ANKN3258

Yan, Z., Shen, Z., Yuan, H., Wu, Z., & Tang, X. (2025). The relationship between teachers' digital literacy and teaching competence: the chain mediating role of psychological capital and learning engagement. *Education and Information Technologies*, *30*(17), 25059-25079.

Zhang, J., & Wu, Y. (2025). Impact of university teachers' digital teaching skills on teaching quality in higher education. *Cogent Education*, *12*(1), 1-15. https://doi.org/10.1080/2331186X.2024.2436706

Article received: 12.08.2025.
Updated version received: 14.01.2026.
Accepted for publishing: 20.03.2026.

Maja Veljković Michos
Singidunum University, Belgrade, Serbia
https://orcid.org/0000-0003-2931-6554

Valentina Bošković Marković
Singidunum University, Belgrade, Serbia
https://orcid.org/0000-0001-8873-6706

Sacmir Seferović
Sinergija University, Bijeljina, Bosnia and Herzegovina
https://orcid.org/0009-0001-6438-2330

This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Studies in Teaching and Education, 2026, *75*(2), 503-519
https://doi.org/10.5937/niv75-64939

ISSN 0547-3330
eISSN 2560-3051
Original research paper

Peer Feedback in ESP Presentation Tasks: Students' Perceptions and Pedagogical Implications

Mirna Vidaković[1]
Faculty of Economics in Subotica, University of Novi Sad,
Subotica, Serbia

Abstract *Although presentation competence is considered one of the core competences of graduates and professionals, it is still inadequately addressed in higher education. Given the growing prominence of peer feedback in contemporary pedagogical discourse, this paper explores its potential to foster students' presentation competence. The study, set within an English for Specific Purposes context, examines the experiences of feedback providers and recipients in terms of benefits and challenges of this approach, and their perceptions of its impact on presentation performance. The aim is to obtain guidelines for the successful integration of peer feedback into classroom practice. The sample included 60 first-year university students attending the English for Economists course. They filled out a questionnaire upon completing the activity, which comprised multiple-choice, Likert-scale, and open-ended questions. Quantitative and qualitative data were analysed using descriptive statistics, the Mann-Whitney test, and thematic content analysis. The findings reveal positive attitudes towards peer feedback, particularly among students who assumed both roles. Respondents perceived the approach as beneficial for improving presentation skills, critical thinking, reflection, and self-regulated learning. The results also reveal challenges related to feedback quality, emotional discomfort, engagement, and time constraints. The study highlights the importance of well-designed instruction and joint consideration of cognitive, social, and affective dimensions when integrating peer feedback into the learning process.*

Keywords: *peer feedback, peer reviewer, peer feedback recipient, higher education, presentation competence.*

1 mirna.vidakovic@ef.uns.ac.rs

Introduction

Presentation competence is nowadays considered an indispensable attribute of higher education students and professionals (Murillo-Zamorano & Montanero, 2018; Palmour, 2026; van Ginkel et al., 2015, 2017). However, educational institutions often fail to (effectively) equip undergraduates with the knowledge and skills needed to deliver impactful presentations (Murillo-Zamorano & Montanero, 2018; Palmour, 2026; van Ginkel et al., 2015, 2017). Presentation competence is either assumed by educators or addressed through traditional, prescriptive instruction and assessment, which overlook student agency and limit the opportunities for practice and timely, individual feedback (Prosenjak & Lučev, 2020; Qaiser et al., 2022; Zareva, 2009). A commonly cited definition describes the construct as "the combination of knowledge, skills, and attitudes needed to speak in public in order to inform, to self-express, to relate and to persuade" (De Grez, 2009, p. 5), highlighting its complexity and interplay between cognitive, behavioural, and affective domains (van Ginkel et al., 2015).

Over the past two decades, peer feedback has been recognised as an increasingly effective strategy to foster students' communication competence. As a collaborative form of learning which promotes students' meaningful engagement and accountability, it aligns closely with the principles of social-constructivist pedagogy. Additionally, it strengthens metacognitive, interpersonal, and other professional skills (Adachi et al., 2017; Ardill, 2025; Carless & Boud, 2018; Jerotijević Tišma, 2016; Stančić, 2020; Topping, 2017; Zamorano et al., 2025), increasing young professionals' employability and career prospects.

Peer feedback, however, is not sufficiently employed and explored in the Serbian educational context. Scant research addresses it in relation to writing skills (Anđelković, 2022; Čorbić, 2024; Prodanović Stankić, 2017), and, to the authors' knowledge, only one article explores peer assessment of speaking performance, comparing it with teacher assessment (Jerotijević Tišma, 2016). Therefore, to contribute to the body of research and pedagogical practice, this paper examines peer feedback in the context of enhancing students' presentation competence. Set within an English for Economists course, it investigates students' experiences as providers and/or recipients of feedback, analysing their perceptions of its benefits, challenges, and the impact on presentation competence. The findings highlight the key aspects underlying the process, thus deepening understanding of this practice and providing significant pedagogical implications for its implementation that extend beyond the English for Specific Purposes (ESP) context.

Literature review

Peer feedback is "a learning activity where individuals or small group constellations exchange, react to and/or act upon information about their performance on a particular learning task, with the purpose to accomplish implicit or explicit shared and individual learning goals" (Alqassab et al., 2018, p. 12). In peer feedback, students can act as providers and/or recipients of feedback. Participation in these two roles entails distinct dynamics

and learning outcomes, which teachers need to be aware of in order to guide this process effectively (Zamorano et al., 2025). The following paragraphs will explore the key issues that arise from these two roles and review existing findings on the impact of peer feedback on presentation competence and performance.

Peer feedback providers: benefits and challenges

Students who provide feedback "use their knowledge and skills to review, clarify and correct others' work" (Kim, 2009, p. 105). This role has long been under-researched, but recent studies indicate that the act of producing feedback is perceived by both teachers and students as highly useful in terms of student engagement, learning outcomes, and skills enhancement (Adachi et al., 2017; Ardill, 2025; Murillo-Zamorano & Montanero, 2018; Nicol et al., 2013). Some authors consider it even more beneficial than receiving feedback alone (Lundstrom & Baker, 2009; Nicol et al., 2013).

Focusing on benefits, authors note that peer feedback providers experience strengthening of critical thinking and evaluative judgement, self-regulated learning, reflection, communication and interpersonal skills as well as improvements in their own task performance (Ardill, 2025; Nicol et al., 2013; Prodanović Stankić, 2017; Winstone & Carless, 2020). Students reported devising methods to analyse and evaluate work and gaining a better understanding of assessment criteria (Nicol et al., 2013; Winstone & Carless, 2020), which led to greater learner autonomy (Ardill, 2025). Peer feedback shifts power dynamics between teachers and students (Ardill, 2025). Stančić (Stančić, 2020) notes that students' participation in decision-making increases their sense of being respected.

However, feedback providers also encounter challenges in this process. Students may believe they lack sufficient content and linguistic knowledge necessary to produce good-quality feedback (Ardill, 2025; De Grez et al., 2012; Stančić, 2020; Zhan, 2024). Zhan (Zhan, 2024, p. 7), for example, observed that students "worried about their ability to accurately express their comments in English", so they refrained from offering comments that were difficult to articulate. In Ardill's (Ardill, 2025) study, students highlighted the significance of obtaining clear instructions and objectives for producing peer feedback. Adachi et al. (Adachi et al., 2017, p. 8) noted that "students engage less with self and peer assessment when they do not 'own' the assessment and understand 'why' they are asked to it." A lack of effort invested by feedback producers may discourage their peers (Nicol et al., 2013; Zhou et al., 2020).

Concerns have also been raised about discomfort and bias. Students may feel uncomfortable when criticising peers' work (Ardill, 2025; Stančić, 2020; Topping, 2017), especially if it affects peers' final grades. Qaiser et al. (Qaiser et al., 2022) and Prosenjak and Lučev (Prosenjak & Lučev, 2020) found that some students provided inflated feedback out of fear of jeopardising peer relationships. In the context of Serbian education, Čorbić (Čorbić, 2024, p. 100) linked this issue to the collectivist culture, characterised by "a high tendency towards uncertainty avoidance and solidarity."

Peer feedback recipients: benefits and challenges

Unlike the role of peer feedback providers, the perspective of feedback recipients has been investigated much more extensively. Research has shown that as recipients of feedback, students "improve their task performance, their self-regulated learning, or critical thinking" (Tsivitanidou & Constantinou, 2016, as cited in Zamorano et al., 2025, p. 2). Student feedback is deemed more accessible to peers than teachers' which is a result of shared language and experiences (Adachi et al., 2017; Ardill, 2025). By processing feedback from multiple peers, students broaden perspectives on their own work and foster critical thinking and reflective skills (Ardill, 2025; Nicol et al., 2013). Cho and MacArthur (Cho & MacArthur, 2011) observed increased feedback uptake due to the multiplicity of feedback.

However, the research has revealed that responding to feedback may be hindered by different challenges. Students may feel sceptical about their peers' ability to provide constructive, helpful feedback (Ardill, 2025; van Ginkel et al., 2017). They report the feedback being too general, superficial, or unclear (Nicol et al., 2013; Stančić et al., 2024; Zhan, 2024), which may hamper revisions and the quality of the final output.

A lack of willingness to respond to feedback is another commonly cited challenge (Price et al., 2010; Zhan, 2024). It may stem from students' past experiences, emotional resistance, a lack of impact on the final grade, or even laziness (Price et al., 2010; Zhan, 2024). Zhan (Zhan, 2024) also noted that emotional resistance becomes particularly prominent when students receive criticism.

At the end of this section on overall benefits and challenges of peer feedback across different roles, it is important to emphasise that existing research has largely focused on feedback producers and recipients separately, or sometimes even without distinguishing between them (Zamorano et al., 2026). Also, much greater attention has been given to the role of feedback recipients. Therefore, further investigation into students' experiences of performing both roles within the same feedback cycle is necessary, as it provides a more comprehensive understanding of the potential of this practice.

Impact of peer feedback on presentation competence

Although limited, research on the effectiveness of peer feedback on presentation competence has yielded significant results.

Van Ginkel et al. (Van Ginkel et al., 2015, 2017) observed the superiority of teacher over peer and self-assessment in terms of presentation behaviour, whereas attitudinal and cognitive dimensions improved regardless of the feedback source. Murillo-Zamorano and Montanero (Murillo-Zamorano & Montanero, 2018), on the other hand, showed that when accompanied by rubrics and oral discussion, peer feedback can have a higher impact on presentation performance than traditional teacher feedback, as these tools provide "a structured framework for socialisation and reflection". Their respondents demonstrated significant improvements in both the content (introduction and structure) and expressiveness (verbal and non-verbal eloquence). The authors (Gudiño et al.,

2024; Murillo-Zamorano & Montanero, 2018) also noted that a single training session with rubrics did not yield sustained results, indicating the need for consistent, continuous training. Contrary to this study, Urena-Rodriguez et al. (Urena-Rodriguez et al., 2025) and Day et al. (Day et al., 2021) did not observe improvements in public speaking skills and performance, which Day et al. (Day et al., 2021) linked to the lack of feed forward, i.e., suggestions for improvement.

In terms of more specific impact on various aspects of presentation competence, Dickson et al. (Dickson et al., 2019) and Prosenjak and Lučev (Prosenjak & Lučev, 2020) reported improvements in grades, understanding of assessment criteria, persuasiveness, confidence, and anxiety levels. King et al. (King et al., 2000, p. 365) showed that immediate feedback was more effective for immediate aspects of presentations, such as maintaining eye contact, whereas delayed feedback proved more beneficial for "deliberative and effortful processing", such as adjusting the length of a presentation introduction.

Overall, the findings indicate that this area requires further investigation, not only due to limited research but also mixed empirical evidence. The results suggest that the effectiveness of practice is highly dependent on its design. Therefore, instructional elements which lead to positive learning outcomes should be examined more thoroughly.

The research presented in the following sections draws on key themes and observations from the aforementioned studies while also allowing new topics to emerge that would shed more light on peer feedback as used to enhance presentation competence.

Research methodology

Research context

The research was conducted within the ESP course *English for Economists*, offered to first-year Bachelor's-level students. Giving a presentation represents a compulsory course assignment and contributes to the overall course grade. Having observed weaknesses in students' presentation delivery and the limited effectiveness of traditional instruction, the author decided to incorporate peer feedback to enhance students' competence. This small-scale project consisted of three phases spanning several weeks of the course. It had two iterations, the first in the spring semester of the academic year 2022/2023 and the second in the spring semester of the academic year 2023/2024, encompassing two generations of freshmen. Below are the phases that the project comprised:

1. Training: Students attending the course participated in the presentation and peer feedback training sessions. Within the latter, they were acquainted with a feedback form, i.e., a rubric, which they would use to assess their peers' presentations. The rubric included categories concerning the presenter, presentation structure, communication style, and visuals. Each category consisted of multiple items. For example, the presenter criterion addressed the speaker's preparedness, interest in the topic, and ability to engage the audience, whereas the communication style referred to fluency, accuracy, pronunciation, and body language. At the end of the training, students were invited to prepare five-minute presentations on a topic related to their discipline, which would

subsequently be reviewed by peers using the rubric. Presenting was voluntary, with a maximum of 10 students per group. Presenters were expected to participate in two rounds of presentations.

2. The first round of presentations: Volunteer presenters gave their presentations, each followed by written peer feedback intended to guide presenters' revisions. Reviewers, working in pairs, had to select the appropriate option (present, absent, needs improvement) for each criterion in the rubric and provide specific, constructive comments and advice. The presenters collected their feedback.

3. The second round of presentations: The presenters gave the reviewed presentations, which were graded by the teacher based on the same rubric that students had used in the peer feedback process. The presenters received additional points for their participation.

All presenters also acted as reviewers (though not as self-assessors), whereas other students performed only the role of reviewers. The task structure ensured that all students participated under the same conditions. Upon completing the activity, the participants filled out a questionnaire, whose aim, design, and results are presented in this paper.

Aim

The research was designed to explore students' attitudes and experiences which concern the implementation of peer feedback as a means of enhancing presentation competence. It comprised the following research questions:

1. How do reviewers perceive and experience providing peer feedback?
2. How do presenters perceive and experience obtained peer feedback?
3. How do students perceive the peer feedback approach overall in terms of benefits, limitations, and drawbacks?
4. Is there a statistically significant difference between students who assumed different roles (reviewers vs. presenters and reviewers) regarding peer feedback incorporation into regular classroom practice and their satisfaction with the activity?

The results offer valuable pedagogical insights which can inform a more effective implementation of peer feedback.

Sample

The sample comprised 60 first-year university students, with 30 attending the English for Economists course in each of the 2022/2023 and 2023/2024 academic years. Purposive sampling was employed as the relevant information could only be obtained from individuals who participated in the feedback activity. There were 61.67% female and 36.67% male respondents, whereas 1.67% did not disclose their gender. Their English proficiency level, as determined by the Oxford Placement test taken at the beginning of the

course, was mainly at B2 or C1 CEFR levels (30% and 38.33% respectively). Other levels were also represented, but with lower percentages (A1: 6.67%; A2: 1.67%; B1: 16.67%; C2: 6.67%). As for the activity roles, 71.66% acted as both presenters and reviewers, whereas the remaining 28.33% participated solely as reviewers.

Research instrument and data analysis

An anonymous online questionnaire (Microsoft Forms) was designed, drawing on relevant research (Huisman et al., 2018; Strijbos et al., 2010). It was administered during the 2022/2023 and 2023/2024 academic years. The students were informed about the purpose of the research and the voluntary nature of their participation. The questionnaire consisted of two sections. The first, containing three multiple-choice questions, aimed to collect general data on participants: gender, English language proficiency according to CEFR, and role in the feedback activity. The second section, comprising four five-point Likert-scale items, one multiple-choice, and three open-ended questions, focused on the central research topics. These are divided into three categories:

1. Perceptions and experiences related to giving feedback (clarity of instructions and criteria, reviewers' confidence, usefulness of providing feedback, difficulties encountered when providing feedback);
2. Perceptions and experiences related to using feedback (accuracy and usefulness of feedback, willingness to improve presentation competence, impact of feedback on presentation performance); and
3. Overall view of the feedback activity in terms of benefits, limitations, and drawbacks, integration of peer feedback into regular classroom practice, and student satisfaction with the activity.

The strong reliability of the Likert scales was confirmed by Cronbach's Alpha coefficients of .885 for Likert-scale question 4, containing 4 items, and .816 for Likert-scale question 6, containing 5 items.

Data analysis was conducted using SPSS version 20. Quantitative data were analysed through descriptive statistics, including frequencies, percentages, medians, and standard deviations (*SD*). The study of statistical differences in students' perceptions of the integration of peer feedback into regular classroom practice, and their satisfaction based on assumed roles, employed the Mann-Whitney test. This test was used because the Likert-scale data exhibited right-skewness. Additionally, given the unequal sample sizes (presenters and reviewers: 43 vs. reviewers: 17) and the violation of the normality assumption, a nonparametric rank-based approach provided more reliable results. Qualitative data were examined through thematic content analysis, involving coding responses and identifying themes. The mixed-method approach helped analyse key peer feedback issues and capture additional emerging findings. Furthermore, qualitative data were used to explain and contextualise quantitative results, thereby enhancing the potential for interpretation and, consequently, the validity of the study.

Results and discussion

In the first research question, students were asked to express their level of agreement or disagreement with general statements regarding giving feedback (Table 1).

Table 1
Students' perceptions about giving feedback

Statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*Median*	*SD*
1. I was provided with clear and sufficient instructions for giving feedback.	1.67%	1.67%	8.33%	30.00%	58.33%	5	.850
2. Feedback criteria were clearly defined in the feedback form.	1.67%	3.33%	10.00%	36.67%	48.33%	4	.899
3. I can provide good-quality feedback.	1.67%	5.00%	21.67%	48.33%	23.33%	4	.892
4. I consider giving feedback useful.	1.67%	3.33%	11.67%	40.00%	43.33%	4	.898

The majority of respondents felt well-instructed to undertake this activity and recognised the value of giving peer feedback, with over 80% agreement on statements 1, 2, and 4. Students' positive attitude towards feedback is a key factor for their engagement (Huisman et al., 2018). Notably, 85% of students understood the rubric criteria, a prerequisite for enhancing the quality of feedback and, eventually, performance. Murillo-Zamorano & Montanero (Murillo-Zamorano & Montanero, 2018, p. 141) also found that a rubric helps students focus not on their peers, but on "what they observe in the products and what can be improved." A slightly smaller, but still significant percentage of the sample (71.66%) believed they could produce good-quality feedback. Though aligned with the previous finding, this result also suggests that some students require more practice to gain competence and confidence in reviewing peers' work. Scaffolding peer feedback through sustained coaching, a rubric, and tutor facilitation is generally emphasised in literature (Ardill, 2025; Gudiño et al., 2024; Murillo-Zamorano & Montanero, 2018; Dong et al., 2023). It deepens students' understanding of the process, develops feedback literacy, and helps establish trust in peers' capabilities.

The second question investigated the types of difficulties students encountered when giving feedback. The surveyed participants could select multiple answers and add their own if the provided options did not reflect their experience. Since percentages are reported per option, the total may exceed 100% due to multiple selections.

Half of the sample (50%) did not report any difficulties. However, the remaining participants faced various challenges (35% reported multiple issues), the most prominent being fear of hurting their colleagues' feelings (30%) and difficulty expressing ideas clearly in the peer feedback form (25%). A smaller percentage believed their feedback would be disregarded (15%), and had concerns about personal bias (15%), time constraints (13.33%), lack of competence (11.67%), and disinterest (10%). One student added that it was diffi-

cult to determine which criteria were met/unmet by presenters. These obstacles have also been documented in research (Ardill, 2025; De Grez et al., 2012; Stančić, 2020; Zhan, 2024), and some of them will be reiterated in the open-ended question on drawbacks and limitations of peer feedback. Overall, the results point to the importance of joint consideration of cognitive, affective, and social aspects prior to and during the implementation of feedback. Although students previously claimed to be well-prepared for peer feedback, the data clearly indicate the need for more tutor support and practice, including exemplars and a rubric, along with their actual use. The results also emphasise the importance of creating an environment where students are more willing to accept criticism and recognise the value of feedback, which might increase their engagement.

The following question aimed to gain insight into students' perceptions of the obtained feedback, its uptake, and impact on presentation performance. The presenters were asked to express their agreement or disagreement with five claims on a five-point Likert scale (Table 2).

Table 2
Presenters' perceptions of the obtained feedback, its uptake and impact

Statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*Median*	*SD*
1. I consider my colleagues' feedback accurate.	2.33%	0.00%	18.60%	51.16%	27.91%	4	.835
2. I consider my colleagues' feedback helpful.	2.33%	2.33%	6.98%	44.18%	44.18%	4	.886
3. I disregarded my colleagues' feedback.	25.58%	44.18%	25.58%	2.33%	2.33%	2	.905
4. I was willing to improve my presentation performance.	2.33%	0.00%	6.98%	20.93%	69.76%	5	.849
5. I have improved my presentation performance as a result of peer feedback.	4.76%	2.33%	16.67%	28.62%	47.62%	4	1,171

The largest portion of students expressed willingness to improve their presentation performance (90.69%), and a significant percentage (76.24%) reported that their performance improved as a result of the peer feedback activity. Most respondents considered feedback helpful (88.36%), accurate (79.07%), and did not disregard it (69.76%). The results reflect inter-alignment and show that students were highly motivated and engaged in the activity. They support the observation by Price et al. (Price et al., 2010, p. 279) that "feedback can only be effective when the learner understands the feedback and is willing and able to act on it."

In the next, open-ended question, students were invited to elaborate on their responses. Half of the sample (53.33%) provided comments which mainly reiterated their

positive attitudes (e.g., "It was such a good idea to let our colleagues give us feedback. They helped me improve my presentation skills.", "The peer feedback I received was really helpful. It provided me with new insights and perspectives on my presentation. I was definitely open to improving my performance."). Certain comments pointed to challenges (e.g., "I think that feedback was helpful, but peer reviewers were not motivated enough to give detailed feedback.", "I didn't disregard my colleagues' comments because I found them useful, though not completely accurate."). They reveal that students approached the feedback critically and highlight the need to address the issues of accuracy and engagement. This is additionally supported by the percentage of students who selected the "Neither agree, nor disagree" option for the statements regarding peer feedback accuracy (statement 1) and uptake (statement 3).

Overall, the activity fulfilled its main learning objective, with students reporting enhanced presentation competence and performance. This was also observed by the teacher during the assessment. Although some authors note that students may be sceptical about their peers' ability to provide good-quality feedback, this study corroborates the findings by Ardill (Ardill, 2025), Gudiño et al. (Gudiño et al., 2024), Murillo-Zamorano and Montanero (Murillo-Zamorano & Montanero, 2018), and Prosenjak and Lučev (Prosenjak & Lučev, 2020), who suggest that careful scaffolding of the activity, the opportunity to deliver a revised presentation, incorporation of a rubric, and teacher guidance can greatly contribute to its successful outcome.

The following open-ended question aimed to examine students' perceptions of the benefits of peer feedback. The analysis of responses provided by 55 students is presented in Table 3.

Table 3
Students' perceptions of benefits of peer feedback

Theme	Illustration	Number of mentions
Presentation and communication skill improvement	"I improved body language [...], presentation visuals, and the quality of the presentation (text, structure, bullet points, contrast in colours...)." "It [peer feedback] develops communication and public speaking skills."	29
Awareness of strengths and weaknesses	"[Peer feedback helps] better understand the problems we encounter during presenting."	13
Direction for improvement	"It offered constructive criticism, helping me identify areas for improvement."	8
Insight into multiple perspectives	"It [peer feedback] provided diverse perspectives, giving me insights from different viewpoints."	7
Increased confidence	"It [the activity] boosted my confidence."	6

Learning through repetition	"The huge benefit of this whole project is that we could present two times."	5
Reduced anxiety	"We had a trial round [...], and it was really helpful to get past the stage fright."	4
Improved feedback skills	"Working on constructive criticism and learning how to take it in without feeling blue [was beneficial for me]."	2
Cooperation	"It [peer feedback] enhanced collaboration, fostering a supportive learning environment."	1

The benefits expressed by students align with previous research (Ardill, 2025; van Ginkel et al., 2017; Nicol et al., 2013; Prodanović Stankić, 2017; Winstone & Carless, 2020) and demonstrate how peer feedback can influence the actual performance as well as related cognitive, affective, and social dimensions, indicating its multifaceted and transversal nature. Responses reflect students' engagement with the criteria and willingness to accept diverse perspectives and address their own weaknesses. They also emphasise the importance of scaffolding peer feedback through the rubric and iterative practice.

The following open-ended question examined students' perceptions of limitations and drawbacks of peer feedback. Of the 52 students who responded, 22 did not report any problems, whereas the rest highlighted limitations presented in Table 4.

Table 4
Students' perceptions of the drawbacks and limitations of peer feedback

Theme	Illustration	Number of mentions
Lack of sincerity, accuracy, depth	"Some of the peer feedback reviewers did not provide sincere information." "Some comments from reviewers were not specific enough." "Some feedback went against the other feedback."	12
Reviewer competence	"Some people don't know how to express their ideas." "[Sometimes] we don't understand a topic well enough when giving feedback, and I don't know if the feedback was useful."	7
Low engagement	"I think that some of them [students] did not pay much attention to presentations." "I believe that students are often not interested in activities without value (in terms of grade or points)."	6
Time constraints	"[There was] limited time to write my own opinion. Maybe the questions were too detailed."	4
Fear of jeopardising relationships	"My personal opinion is that many of my colleagues were afraid to hurt colleagues who presented." "Peers may hesitate to be critical because it could strain relationships."	4
Time-consuming nature	"[It was] time-consuming."	3

In terms of drawbacks and limitations, students' responses corroborate previous findings on a multiple-choice question addressing obstacles, indicating certain instructional gaps and the need to enhance students' feedback literacy. Most respondents identified challenges related to feedback quality and reviewers' competence, which are interconnected. The comments emphasise the necessity to train students to produce feedback. The last comment about reviewers' competence highlights that this skill develops gradually through practice. However, the poor quality of feedback may be linked to other themes too, such as low engagement, time constraints, and fear of damaging relationships, as Qaiser et al. (Qaiser et al., 2022) noted. Therefore, the training should also address the affective dimension, teaching students how to deliver and respond to criticism constructively.

It is worth mentioning that both the affective aspect and the quality of feedback can also be associated with collectivist culture, as observed by Čorbić (Čorbić, 2024). The author found that the communication strategies and linguistic choices employed in students' peer feedback were influenced by their desire to demonstrate solidarity, politeness, and friendliness. The same explanation is plausible in this case, i.e., students tend to minimise mistakes and offer insufficiently specific or inflated feedback to maintain friendly relationships and strengthen group membership.

Furthermore, the findings emphasise the issue of motivation and the need to introduce mechanisms in order to increase student engagement (e.g., by awarding points to reviewers as well). Ardill (Ardill, 2025) also argues that educators should continuously articulate the value of feedback as a lifelong skill.

The final two five-point Likert-scale items examined students' attitudes towards incorporating peer feedback into regular classroom practice and their overall satisfaction with the activity. With respect to the first question, the majority of the sample supported integration (36.67% agreed and 26.67% strongly agreed), 33.33% neither agreed nor disagreed, whereas 3.33% opposed it. The median was 4, with a standard deviation of 0.889. As for the latter, nearly half of the sample (48.33%) reported the highest level of satisfaction (value 5), 35% selected value 4 and the remaining 16.67% value 3. None opted for the lowest values 1 and 2. The median for this item was 4, with a standard deviation of 0.748. These results are encouraging and suggest that, with certain adjustments to the implementation (as indicated in previous questions), peer feedback is an effective and engaging approach to increase presentation competence. The analysis of statistical differences in attitudes by a role assumed during the activity revealed significant differences for both questions. The first result indicated a medium effect size ($z = -3.139$, $p = .002$, $r = .41$), whereas the second indicated a medium to large effect size ($z = -3.598$, $p < .001$, $r = .46$). Students performing both roles expressed greater recognition and satisfaction with the activity than those who only produced feedback. This indicates that experiencing feedback from both perspectives increased students' understanding of its value, especially as they could also observe its impact on their actual performance.

Conclusion

This study examined ESP students' attitudes and experiences regarding benefits and challenges of peer feedback, and their perceptions of its role in enhancing presentation competence. Analysing the perspectives of both producers and recipients of peer feedback provides a deeper understanding of the mechanisms and potential of this process. The findings offer valuable pedagogical implications that extend beyond the ESP field.

Overall, the peer feedback activity used to enhance presentation competence has proven beneficial in many ways. Students reported that it improved their presentation performance and transferable skills. In terms of performance, the activity helped respondents better understand the criteria for effective presentations, identify areas for improvement, and gain confidence. This was also observed by the teacher during the assessment of the revised presentations. Regarding the latter, students reported that, by actively engaging with the feedback rubric and multiple perspectives, and through collaboration, they enhanced their cognitive and critical thinking skills as well as self-regulated learning. The pedagogical implication of these gains is that the impact of peer feedback is highly dependent on the instructional design. The provision of training using exemplars and the rubric, and the iterative nature of the process (the opportunity to deliver the revised presentation and the repeated production of feedback) contribute to positive learning outcomes. Important, indisputably, is the students' willingness to engage in the process.

However, the challenges reported in the study revealed certain gaps in the implementation process. The major concerns focused on the quality of feedback in terms of accuracy, specificity, and objectivity; reviewers' competence in providing feedback; affective factors, such as personal bias and fear of damaging relationships with peers; engagement, particularly on the part of reviewers; and time constraints. The consistent occurrence of these themes throughout the research highlights the need for specific actions in order to mitigate their impact on learning outcomes and student satisfaction. These issues are interconnected, indicating the complexity of the process and the necessity to consider cognitive, affective, and social dimensions together during the pre-implementation and implementation phases of peer feedback. Pedagogically, the findings suggest that more focus should be placed on scaffolding students' ability to produce good-quality feedback through modelling, ongoing practice, and tutor guidance. It is especially important for students to learn how to give both positive and critical feedback constructively. Careful framing of feedback and fostering a supportive learning environment can help reduce emotional barriers. Regarding engagement, the research indicates that assuming dual roles helps students gain a deeper understanding of the value of feedback. Also, incentivising students' participation might help in the process. However, students must recognise

the true value of peer feedback, which requires educators to continually emphasise its benefits for "lifelong professional development throughout higher education and future practice" (Ardill, 2025, p. 20).

Finally, it is important to acknowledge certain limitations of the study. The sample was restricted to a single institution and a specific student profile (economics students). Conducting a study with a larger, more diverse sample in a multi-institutional setting would increase the generalizability of the findings and possibly reveal disciplinary differences in the approach to this practice. Furthermore, the reliance on a self-report questionnaire increases the risk of response bias. Including additional data sources, such as video recordings of presentations and/or teacher assessment, could enhance the objectivity and credibility of conclusions. Despite constraints, the research is valuable as it provides important insights into a practice which has proven numerous learning benefits. Further research might focus on teachers' perspectives, particularly on their beliefs and practices regarding peer feedback. This would help gain a more comprehensive understanding of the current educational context in this respect and inform a more systematic integration of this activity into classrooms.

References

Adachi, C., Tai, J. H. M., & Dawson, P. (2017). Academics' perceptions of the benefits and challenges of self and peer assessment in higher education. *Assessment & Evaluation in Higher Education*, *43*(2), 294-306. https://doi.org/10.1080/02602938.2017.1339775

Alqassab, M., Strijbos, J. W., & Ufer, S. (2018). Training peer-feedback skills on geometric construction tasks: Role of domain knowledge and peer-feedback levels. *European Journal of Psychology of Education*, *33*(1), 11-30. https://doi.org/10.1007/s10212-017-0342-0

Anđelković, J. (2022). Peer and teacher assessment of academic essay writing: Procedure and correspondence. *Journal of Teaching English for Specific and Academic Purposes, 10*(1), 171-184. https://doi.org/10.22190/JTESAP2201171A

Ardill, N. (2025). Peer feedback in higher education: student perceptions of peer review and strategies for learning enhancement. *European Journal of Higher Education*, *15*(4), 696-721. https://doi.org/10.1080/21568235.2025.2457466

Carless, D., & Boud, D. (2018). The development of student feedback literacy: enabling uptake of feedback. *Assessment & Evaluation in Higher Education*, *43*(8), 1315-1325. https://doi.org/10.1080/02602938.2018.1463354

Cho, K., & MacArthur, C. (2011). Learning by reviewing. *Journal of Educational Psychology*, *103*(1), 73-84. https://doi.org/10.1037/a0021950

Čorbić, I. (2024). Speech act of criticism in peer feedback on argumentative essays of university students of English in computer-mediated communication (CMC). *Belgrade English Language and Literature Studies, 16*(1), 85-110. https://doi.org/10.18485/bells.2024.16.4

Day, N. Z. I., Saab, N., & Admiraal, W. (2021). Online peer feedback on video presentations: type of feedback and improvement of presentation skills. *Assessment & Evaluation in Higher Education*, *47*(2), 183-197. https://doi.org/10.1080/02602938.2021.1904826

De Grez, L. (2009). *Optimizing the instructional environment to learn presentation skills* (PhD Thesis). Academic bibliography. https://biblio.ugent.be/publication/7051516

De Grez, L., Valcke, M., & Roozen, I. (2012). How effective are self- and peer assessment of oral presentation skills compared with teachers' assessments? *Active Learning in Higher Education*, *13*(2), 129-142. https://doi.org/10.1177/1469787412441284

Dickson, H., Harvey, J., & Blackwood, N. (2019). Feedback, feedforward: evaluating the effectiveness of an oral peer review exercise amongst postgraduate students. *Assessment & Evaluation in Higher Education*, *44*(5), 692-704. https://doi.org/10.1080/02602938.2018.1528341

Dong, Z., Gao, Y., & Schunn, C. D. (2023). Assessing students' peer feedback literacy in writing: scale development and validation. *Assessment & Evaluation in Higher Education*, *48*(8), 1103-1118. https://doi.org/10.1080/02602938.2023.2175781

Gudiño, D., Fernández-Sánchez, M. J., Becerra-Traver, M.-T., & Sánchez-Herrera, S. (2024). University students' perceptions of peer assessment in oral presentations. *Education Sciences*, *14*(3), 221-226. https://doi.org/10.3390/educsci14030221

Huisman, B., Saab, N., van Driel, J., & van den Broek, P. (2018). Peer feedback on academic writing: undergraduate students' peer feedback role, peer feedback perceptions and essay performance. *Assessment & Evaluation in Higher Education*, *43*(6), 955-968. https://doi.org/10.1080/02602938.2018.1424318

Jerotijević Tišma, D. (2016). Serbian EFL teachers and learners' attitudes to peer assessment and the comparison of teacher and peer speaking assessment scores. *Nastava i vaspitanje*, *65*(2), 379-393. https://doi.org/10.5937/nasvas1602379j

Kim, M. (2009). The impact of an elaborated assessee's role in peer assessment. *Assessment & Evaluation in Higher Education*, *34*(1), 105-114. https://doi.org/10.1080/02602930801955960

King, P. E., Young, M. J., & Behnke, R. R. (2000). Public speaking performance improvement as a function of information processing in immediate and delayed feedback interventions. *Communication Education*, *49*(4), 365-374. https://doi.org/10.1080/03634520009379224

Lundstrom, K., & Baker, W. (2009). To give is better than to receive: The benefits of peer review to the reviewer's own writing. *Journal of Second Language Writing*, *18*(1), 30-43. https://doi.org/10.1016/j.jslw.2008.06.002

Murillo-Zamorano, L. R., & Montanero, M. (2018). Oral presentations in higher education: a comparison of the impact of peer and teacher feedback. *Assessment & Evaluation in Higher Education*, *43*(1), 138-150. https://doi.org/10.1080/02602938.2017.1303032

Nicol, D., Thomson, A., & Breslin, C. (2013). Rethinking feedback practices in higher education: A peer review perspective. *Assessment & Evaluation in Higher Education, 39*(1), 102-122. https://doi.org/10.1080/02602938.2013.795518

Palmour, L. (2026). What teachers and students value in presentation style: towards inclusive oracy practices in Higher Education assessment. *Journal of Further and Higher Education, 50*(1), 166-183. https://doi.org/10.1080/0309877X.2025.2587826

Price, M., Handley, K., Millar, J., & O'Donovan, B. (2010). Feedback : all that effort, but what is the effect? *Assessment & Evaluation in Higher Education*, *35*(3), 277-289. https://doi.org/10.1080/02602930903541007

Prodanović Stankić, D. (2017). Peer feedback as a collaborative task used in improving writing skills: A case study. *Nastava i vaspitanje 66*(3), 515-526. https://doi.org/10.5937/nasvas1703515P

Prosenjak, B., & Lučev, I. (2020). The impact of peer assessment on the attainment level of oral presentations skills. *Language Value*, *12*(1), 30-55. https://doi.org/10.6035/LanguageV.2020.12.3

Qaiser R., Fadden P., Rustom S., & Shaw J. (2022). Real-time peer-to-peer observation and feedback lead to improvement in oral presentation skills. *Cureus*, *14*(2), e21992. https://doi.org/10.7759/cureus.21992

Qaiser R., Fadden P., Rustom S., & Shaw J. (2022). Real-time peer-to-peer observation and feedback lead to improvement in oral presentation skills. Cureus, 14(2), e21992. https://doi.org/10.7759/cureus.21992

Stančić, M. (2020). Peer assessment as a learning and self-assessment tool: a look inside the black box. *Assessment & Evaluation in Higher Education*, *46*(6), 852-864. https://doi.org/10.1080/02602938.2020.1828267

Stančić, M., Milin, V., & Gašić, A. (2024). Peer feedback in higher education: How students' roles affect providing and receiving feedback. *Studies in Educational Evaluation*, *83*, 101408, 1-9. https://doi.org/10.1016/j.stueduc.2024.101408

Strijbos, J.-W., Pat-El, R. J., & Narciss, S. (2010). Validation of a (peer) feedback perceptions questionnaire. In L. Dirckinck-Holmfeld, V. Hodgson, C. Jones, M. de Laat, D. McConnell, & T. Ryberg (Eds.), *Proceedings of the International Conference on Networked Learning*, *7,* 378-386. Aalborg University Open Publishing. https://doi.org/10.54337/nlc.v7.9203

Topping, K. J. (2017). Peer assessment: Learning by judging and discussing the work of other learners. *Interdisciplinary Education and Psychology, 1*(1), 1-17. https://doi.org/10.31532/InterdiscipEducPsychol.1.1.007

Tsivitanidou, O. E., & Constantinou, C. P. (2016). A study of students' heuristics and strategy patterns in web-based reciprocal peer assessment for science learning. *The Internet and Higher Education*, *29*, 12-22. https://doi.org/10.1016/j.iheduc.2015.11.002

Urena-Rodriguez, L., Lowell, V. L., & Yan, W. (2025). Peer Feedback, English Public Speaking Self-Efficacy, and Performance in Facebook and Brightspace. *Education Sciences*, *15*(7), 879. https://doi.org/10.3390/educsci15070879

van Ginkel, S., Gulikers, J., Biemans, H., & Mulder, M. (2015). Towards a set of design principles for developing oral presentation competence: A synthesis of research in higher education. *Educational Research Review, 14*, 62-80. https://doi.org/10.1016/j.edurev.2015.02.002

van Ginkel, S., Gulikers, J., Biemans, H., & Mulder, M. (2017). Fostering oral presentation performance: does the quality of feedback differ when provided by the teacher, peers or peers guided by tutor? *Assessment & Evaluation in Higher Education*, *42*(6), 953-966. https://doi.org/10.1080/02602938.2016.1212984

Winstone, N., & Carless, D. (2020). *Designing Effective Feedback Processes in Higher Education*. Routledge. https://doi.org/10.4324/9781351115940

Zamorano, D., Panadero, E., Alqassab, M., & Amillano, A. (2025). Effect of peer feedback role: Task performance, feedback implementation and perceptions on learning and trust. *The Journal of Experimental Education*, *94*(4), 797-821. https://doi.org/10.1080/00220973.2025.2466146

Zamorano, D., Panadero, E., Alqassab, M., & Gómez-Varela, J. F. (2026). Provider versus recipient: Peer feedback roles effect on task performance, perceptions of learning, trust, and epistemic emotions. *Studies in Educational Evaluation*, *88*, 101560. https://doi.org/10.1016/j.stueduc.2026.101560

Zareva, A. (2009). Informational packaging, level of formality, and the use of circumstance adverbials in L1 and L2 student academic presentations. *Journal of English for Academic Purposes*, *8*(1), 55-68. https://doi.org/10.1016/j.jeap.2008.12.002

Zhan, Y. (2024). Are they ready? An investigation of university students' difficulties in peer assessment from dual perspectives. *Teaching in Higher Education*, *29*(4), 823-840. https://doi.org/10.1080/13562517.2021.2021393

Zhou, J., Zheng, Y., & Tai, J. H. M. (2020). Grudges and gratitude: the social-affective impacts of peer assessment. *Assessment & Evaluation in Higher Education*, *45*(3), 345-358. https://doi.org/10.1080/02602938.2019.1643449

Article received: 13.02.2026.
Updated version received: 30.04.2026.
Accepted for publishing: 04.06.2026.

Mirna Vidaković
Faculty of Economics in Subotica, University of Novi Sad, Subotica, Serbia
https://orcid.org/0000-0001-8986-7505

This work is published under the Creative Commons Attribution 4.0 International (CC BY 4.0). It is permitted to copy and distribute the work in all media and formats, to remix, transform, and build upon it for any purpose, including commercial purposes, provided that the original authors are properly credited, a link to the original license is included and it is indicated whether the work has been modified. Users are required to provide a full bibliographic citation of the article published in this journal (authors, title of the work, journal title, volume, issue, pagination), as well as its DOI identifier, and in the case of electronic publication, they are also required to provide an HTML link.

Contributors' notes

Studies in Teaching and Education is a journal publishing original scientific research or theoretical and review papers in the field of pedagogy.

Submission of papers

Papers are submitted through an online journal editing system developed by the Center for Evaluation in Education and Science (CEON). Access and registration for this service is done via the Assistant page, using the link: **https://aseestant.ceon.rs/index.php/nasvas/index**.

Papers should be submitted in accordance with the technical standards given in the Contributors' notes. Authors should submit original manuscripts of papers which have not previously been published or simultaneously submitted to another journal. In accordance with these rules, authors are obliged to submit an Authorship statement which can be downloaded from the journal's webpage.

The paper should be accompanied by the following information about the author(s) to the Editorial Board: the name/s and surname/s of the author/s, their year of birth, their academic qualifications, position and e-mail address.

Ethical norms

Submitted papers must be written in accordance with the ethical standards applicable to scientific research papers, respecting the principles of well-being and dignity of research participants, as well as the protection of their privacy (for additional information, consult the latest version of APA Publication Manual).

Use of Artificial Intelligence (AI)

In the preparation of manuscripts for publication in Studies in Teaching and Education, AI tools may be used exclusively for the creation of AI-assisted, but not AI-generated content. Under no circumstances may an AI tool be listed as an author or co-author, nor may it be cited as the author of a referenced work.

Failure to disclose the use of AI tools in a manuscript constitutes a breach of publication ethics and, if confirmed, may result in rejection of the manuscript and the application of measures in accordance with the guidelines of relevant ethical bodies (e.g., COPE). Authors bear full responsibility for the originality, accuracy, and integrity of their work.

Evaluation of papers

After the receipt of the papers the current editor-in-chief will review them and decide which will enter the reviewing process. If a paper does not fit the concept of the journal, does not meet Ethical norms, or the text does not follow the instructions given in the Contributors' notes and other requirements, the authors will be informed of the rejection of the paper.

Papers which enter the review process will be sent for appraisal by two competent reviewers.

The reviewers will not know the author's identity, and the authors will not receive information about the identity of the reviewers.

After review, the Editorial Board will decide on the publication, possible revision or rejection of a paper. All authors receive information about the Board's decisions.

When submitting a paper with corrections, authors should report (in writing) all changes made to the original text (page numbers and marked points where the changes were made), and also mark changes made in the text, in accordance with the remarks and suggestions of the reviewers.

After the acceptance for publication, papers are submitted to a software check for plagiarism. If the results of the check show that the work contains plagiarized text, the work will not be published despite positive reviews.

Publication of papers

If the paper is written in Serbian, the authors are obliged to provide a translation of the abstract into English.

The editors forward the text prepared for printing to the authors by e-mail in order to ensure the final verification before publication. This step does not allow adding new text or making significant changes to the paper.

Publishing costs

There is no fee for the publication of a paper in the journal Studies in Teaching and Education. The journal publisher bears the costs of proofreading, technical preparation and printing of works.

Technical Guidelines

Language

Your paper must be a Microsoft Word text processor document, page A4 format, font Times New Roman, font size 12, line spacing of 1.5 lines.

In accordance with the Regulation on the Categorization and Ranking of Journals, journal Studies in Teaching and Education publishes all papers bilingually — in Serbian (Cyrillic script – Serbian, Cyrillic) and English.

The length

Papers should not normally exceed 30000 characters with spaces in length. However, review papers and papers that present theoretical analysis can be up to 50000 characters long. The Abstract and Reference List, which should be at the end of the paper, are not included in the length. The editors-in-chief reserve the right to publish papers which exceed the maximum number of characters should the subject matter and/ or focus of the research require it, and in the case of scientific papers of particularly high quality.

Elements and structure of a manuscript

Title page. The title page should contain the following information: the title, the name of the author/s (co-authors), the name of the institution (for example: department, faculty, university), the town and the state (if the author is from abroad) and the address of the leading author.

If a paper is reporting about work on a scientific-research project, the essential information about the project should be given in a footnote following the title.

The title. The title should be concise, precisely formulated in the form of a sentence, bolded, centred, and in font size 14.

If the paper is a result of work on scientific research projects, the basic information about the project is provided in a footnote under the paper's title.

Abstract. The abstract should contain from 150 to 250 words. If a paper is about performed research the abstract should contain the following elements: the importance of the researched problem, the aims of the research, the research methodology, key results, conclusions and pedagogic implications. In the case of review papers and papers dealing with theoretical analyses, the abstract should contain: the problem that is discussed in the paper, a description of the structure of the paper, the key propositions that are given in the paper and conclusions. The abstract should be written in one paragraph, without referring to references, in font size 11, justified.

Keywords. The author(s) should provide up to five keywords in the language of the paper which follow the abstract. The keyword should be relevant to the subject of the paper and searchable. We recommend using for example ERIC: https://eric.ed.gov/?ti=all thesaurus.

The structure of a paper. The paper should be structured in a logical and proscribed way. Papers describing performed research should contain: an introduction, an initial research hypothesis, the research methodology, results, discussion (including the pedagogical implications of the conducted research) and conclusions. Review papers and works that represent theoretical analysis, in addition to having an introduction and conclusions, should be structured in accordance with the basic topic of the work.

The headings and sub-headings. The headings and sub-headings should not be numerically denoted. The heading of the sections should be formulated precisely and according to the instructions given in Table 1.

Table 1
Format for five levels of heading

Levels	Format
1	**Centered, bold, font 12**
2	**Flush left, bold, font 12**
3	***Flush left, bold italic, font 12***
4	**Sentence case, indented, bold, font 12, ending with a period.**
5	***Sentence case, indented, bold italic, font 12, ending with a period.***

Note. Format examples are provided for section headings and sub-headings only and do not refer to the title of the paper.

Tables and graphs. Each table and/or graph should be numerically denoted. The precisely formulated title of the table or graph should be given in a new line, in italics. The name of a table or a graph should be positioned above the table or graph (see Table 1 of this note). All abbreviations in the tables and graphs must be explained. The explanations (legend) should be given under the table or graph, the word note should be witten in italic, ending with a period. Tables should not contain vertical lines, while horizontal lines should only be used between the table heading and data (see Table 1 of this note) and at the bottom of the table. If horizontal lines contribute to the clarity of the table, they can be used in the heading of the table.

Tables and charts should be given in Microsoft Word format (which implies that the graphs are illustrated in Word), created and delivered in a program that allows for their additional editing. The information on the graphs should not be highlighted by colours but by pattern fill. If the text contains tables and charts downloaded from the Internet, they should be provided in no less than the resolution of 300 dpi, grayscale colour mode. These parameters apply to any photos that are attached as part of the text.

Statistical tests and measures. All symbols of statistical tests and measures should be written in italics throughout the text, including tables (*M, SD, F, t, p*).

Footnotes and abbreviations. Abbreviations and footnotes should be avoided.

References. The references/bibliography should be constructed according to the APA Citation Style - American Psychological Association 7th Edition (https://apastyle.apa.org/instructional-aids/reference- examples.pdf).

In the list of references at the end of the paper, as well as in brackets within the text, all references, including those in Serbian, are written in Latin script. The surnames of foreign authors in papers written in Serbian are transcribed phonetically. The original surname is also provided in brackets, for example: Скот (Scott, 2004).

References within the text should contain: the author's surname, the year of publication of the source and the number of the page if a citation is made. If a number of authors are to be cited in brackets within the text, they must be cited in alphabetical order, not chronologically. If there are only two authors, both should be written in brackets. When there are more than two authors, the surname of the first author is given and the abbreviation "et al." or „i sar." (depending on the language of the paper).

The Reference List at the end of the paper. The Reference List should include only the sources that the author(s) have used. References are given in alphabetic order by surname of the author. If several publications by the same author are cited, the publications should be listed in chronological order (from the oldest to the latest work). If there are more works by the same author with the same year of publication, the works should be indicated with letters a, b, c, etc., with the year of publication in brackets (e.g. 2012a, 2012b). If there is more than one author, the reference should be cited by the first author`s surname and contain the surnames and initials of the other authors.

The Reference List at the end of the paper should not be numerically denoted.

Examples for citing the references to literature used at the end of the paper:

Book: The reference should contain the surname and initials of all authors, the year of publication in brackets, the title (in italics), and the place and name of the publisher.

Apple, M. W. (2012). *Ideologija i kurikulum*. Fabrika knjiga.

Journal article: The reference should contain the surnames and initials of all authors, the year of publication in brackets, the title of the article, the full name of the journal (italics), volume (italics), number, pages and, if it is available, the DOI number (in https:// form).

Colić, V. (2012). Roditelji i vaspitači o pripremi dece za polazak u školu. *Pedagogija*, *67*(2), 252-260.

Emmer, E. T., & Stough, L. M. (2001). Classroom management: A critical part of educational psychology, with implications for teacher education. *Educational Psychology*, *36*(2), 103-112. https://doi.org/10.1207/S15326985EP3602_5

Book chapters (thematic Proceedings): The reference should contain the surnames and initials of all the authors, the year of publication in brackets, the title of the chapter, initials and surnames of all editors, book title (italics), the first and the last page of the chapter in brackets, place and publisher.

Maksić, S. i Pavlović, J. (2013). Nastava koja podržava kreativnost. U R. Nikolić (ur.), *Nastava i učenje, Kvalitet vaspitno-obrazovnog procesa* (str. 53-64). Učiteljski fakultet u Užicu Univerziteta u Kragujevcu.

Cruse, D. A. (2002). Hyponymy and its varieties. In R. Green, C. A. Bean, & S. H. Myaeng (Eds.), *The semantics of relationships: An interdisciplinary perspective* (pp. 3-22). Kluwer Academic Publishers.

*Scientific meetings and conferences – the papers published in ful*l: The reference should contain the surnames and initials of all the authors, the year of publication, the title of the article, initials and surnames of all editors, the title of the publication (italic), the first and the last page of the article, the place of publication and the name of the institution – the organizer of the meeting/conference.

Spasenović, V., Vujisić Zivković, N., & Skubic Ermenc, K. (2012). The role of comparative pedagogy in the training of pedagogues in Serbia and Slovenia. In N. Popov, C. Wolhuter, B. Leutwyler, G. Hilton, J. Ogunleye, & P. Almeida (Eds.), *International perspectives on education, BCES Conference* (pp. 36-42). Bulgarian Comparative Education Society.

Doctoral and master theses: The reference should contain the name of the author, year of publication, the title of the document (italics) and the note: doctoral, master thesis, the database in which it is published, the number of the dissertation in the database if it is taken from a database.

Stamatović, J. (2013). *Samovrednovanje nastavnika u funkciji unapređivanja vaspitno-obrazovnog rada* (doktorska disertacija). NaRDUS (123456789/3226)

Web documents: The reference should contain the name of the author, the year, the title of the document (italic) and the web address.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). *The difference between emergency remote teaching and online learning*. EDUCASE Review. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Legal documents: The reference should contain the title of the document (italics), the year of publication, the name of the media, and the number.

Pravilnik o programu svih oblika rada stručnih saradnika (2012). Prosvetni glasnik, Službeni glasnik Republike Srbije, br. 5/2012.

Appendices and supplementary materials. Along with the main text, authors can also submit appendices, i.e. additional material that is important for a more complete understanding of the content of the paper.

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

37

НАСТАВА и васпитање = Studies in Teaching and Education / главни и одговорни уредник Милан Станчић. - Год. 1, бр. 1 (март 1952)- . - Београд : Педагошко друштво Србије : Институт за педагогију и андрагогију Филозофског факултета Универзитета у Београду, 1952- (Београд : Службени гласник). - 24 cm

Три пута годишње. - Текст на срп. и енгл. језику. - Друго издање на другом медијуму: Настава и васпитање (Online) = ISSN 2560-3051
ISSN 0547-3330 = Настава и васпитање
COBISS.SR-ID 6026754