Journal of Educational Sciences

An XXIV Nr. 1(47) 2023

ISSN 2457 – 8673 (Online)

Journal published by

WEST UNIVERSITY OF TIMISOARA,
DEPARTMENT OF EDUCATIONAL SCIENCES
and
ROMANIAN INSTITUTE FOR ADULT EDUCATION (IREA)

Bd. V. Pârvan, no. 4, 300223 – Timişoara, Romania Tel. 0040 256 592
Tel/Fax: 0040 256 592 960 (Romanian Institute for Adult Education)
e-mail: resjournal@e-uvt.ro, **https://rse.uvt.ro/**

Contents

"When I'm not at school" - fifth graders' perspectives on the advantages and disadvantages of online instruction

Jelena Minić•, Andjela Keljanović ••, Sanja Vujnović •••, Tatjana Kompirović ••••

Abstract

Objective: This study is part of the broader research[1] conducted to investigate the experiences of pupils, teachers, parents and students regarding online and blended (online and face-to-face classroom) instruction in the Republic of Serbia during the pandemic, focusing on students' perceptions of the changed form of schooling.

Method: The subject of this study was the descriptions of teaching-related events that left a strong impression on 5th grade students in elementary schools in the Republic of Serbia during the first semester of 2020. Thematic analysis was used to collect data in the form of narratives.

Findings: The 5th grade students value events related to the transition from classroom to subject teaching (getting to know the teacher and new subjects) more positively than events related to the change in teaching model caused by the coronavirus pandemic outside (lack of direct contact, inconsistency of online and face-to-face instruction, abbreviated classes). They also highlight the benefits of this instructional model, such as face-to-face teaching (albeit not on a daily basis) and learning about new educational technologies.

Conclusion: The findings can be regarded as a modest contribution to a better understanding of this problem, which remains relevant in light of the current pandemic conditions.

Keywords: online teaching, pandemic, advantages, disadvantages, students

• PhD, Associate professor, University of Priština in Kosovska Mitrovica, Faculty of Philosophy, Department of Psychology, Kosovska Mitrovica, Serbia, jelena.minic@pr.ac.rs

•• MA, Teaching assistant, University of Priština in Kosovska Mitrovica, Faculty of Philosophy, Department of Psychology, Kosovska Mitrovica, Serbia, andjela.keljanovic@pr.ac.rs

••• Professor of Language, Literature and Culture , Language Instructor (English Language and Literature), University of Priština in Kosovska Mitrovica, Faculty of Philosophy, Department of English Language and Literature, Kosovska Mitrovica, Serbia, sanja.vujnovic@pr.ac.rs

•••• PhD, Associate professor, University of Priština in Kosovska Mitrovica, Faculty of Philosophy, Department of Pedagogy, Kosovska Mitrovica, Serbia, tatjana.kompirovic@pr.ac.rs

[1] The present paper is part of a broader research. For more information, please contact Selena Vračar, selenavracar1410@gmail.com

1. Introduction

The coronavirus pandemic has altered how people behave in many aspects of daily life (Tarkar, 2020), affecting not only individuals but also families, systems, communities, institutions, and society as a whole. A significant shift in communication channels, particularly in the student-teacher relationship, as well as new forms of collaboration within teaching communities and the educational system are all indications that significant changes have taken place in the educational process (Braslauskien et al., 2022). In addition to the countless reports[2] and statistics[3], research from various countries indicates the pandemic's effects on the educational process (Reimers, 2022). In order to involve the designers of educational policies and implement online learning more appropriately and effectively (Fauzi, & Sastra Khusuma, 2020; Aucejo et al., 2020; Kovács Cerović, 2021), a review of the works reveals a great interest among researchers, particularly in the issue of online teaching, its impact on the relevant parties (students and teachers), as well as on the impact online teaching has on the quality of knowledge (Arsenijević, 2021). In order to prepare for potential disruptions to education in the future (which may be brought on by natural catastrophes and other extraordinary situations), it can be useful to analyze advantages and disadvantages of the shifting educational landscape under pandemic settings (Sternadel, 2021). Literature evaluations based on data collected in 2020 reveal that studies have analyzed the pandemic's effects from a variety of viewpoints. One of the literature reviews (Mseleku, 2020), which discusses works based on the outcomes of e-learning (e-teaching) as well as challenges and opportunities during the pandemic, cites obstacles such as the inability to use online learning tools, adjustment difficulties, particularly among students from rural areas, and low socioeconomic status. The second review of the literature (Cachón-Zagalaz et al., 2020) focuses on psychological and motor aspects of children up to 12 years old. They find a small number of studies that deal with psychological and academic issues in children (Putri et al., 2020).

The advantages and disadvantages of online instruction are shown through research undertaken at various levels of education and with samples of respondents of varied ages. Researchers from all over the world are increasingly examining the benefits and drawbacks of online and blended learning for students, teachers, and parents (Stojanović, 2020), as well as the challenges and opportunities it presents (Adedoyin & Soykan, 2020). The most pervasive effects of the pandemic on the educational process include the inefficiency of teaching social, cultural, and academic values in light of the altered school environment (Arsenijević, 2021), concern and fear for one's health (Komlenić &

[2] https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19-schools
[3] https://unesdoc.unesco.org/ark:/48223/pf0000373718

Keljanović, 2021), the absence of certain components of the established curriculum, homeschooling, undelivered classes (Scott, McGowan, Visram, 2021), the loss of routine and social interactions with peers (Prodović &Milojković, 2021) ,poorer student discipline, and lack of social interaction with others in the educational process (Hermanto & Srimulyani, 2021), student performance compared to the time of traditional teaching (Gore et al., 2021). Furthermore, experiences with various emotions and states, a lack of decisive action on the part of the educational institution's management, problems with time management, and organizational issues are all drawbacks of online teaching (Braslauskien et al., 2022). Long-term repercussions of the pandemic on education include omission of crucial curriculum components, homeschooling, lecture cancellations, and prolonged periods of isolation (Scott, at. el 2021). Internet issues, difficulties with planning, executing, and evaluating learning, difficulties interacting with parents, and a general dissatisfaction with online learning among teachers (Fauzi & Sastra Khusuma, 2020). Online learning also presents challenges, especially for students with limited electronic resources, additional responsibilities outside of school (Ramos-Morcillo et al., 2020), members of disadvantaged social groups, and those who were not adequately aided during the change in school conditions (Kuzmanović, 2022a). Several studies have also identified problems with assessment in a digital environment (Stepanović, 2020; Kuzmanović, 2022b). Teachers and students frequently cite problems with learning platforms, too many different tools, and dissatisfaction with them during online classes (Baksa & Luić, 2020).

According to findings from a study on the experiences of primary school teachers in the Republic of Serbia during the pandemic (Mićić, Kovács-Cerović, Vračar, 2021) , teachers focused on health, preventative measures, their own family responsibilities, workload, and coping strategies during the first wave of the pandemic. Teachers focused primarily on instructional issues and later on learning outcomes and the learning process during the second and third waves of the Covid 19 virus pandemic (Mićić, Kovács-Cerović, Vračar, 2021). This suggests that certain dynamics and current problems were present depending on the stage of the pandemic and adaptation to the altered ordinary working and living conditions. In several studies, researchers address teacher burnout at work and life satisfaction during the pandemic (Rajović et al., 2021), highlighting the challenges teachers faced in implementing and structuring lessons due to the changed conditions.

In a case study (Putri et al., 2020) that examined the challenges and limitations encountered by students, parents, and teachers, it was determined that limited communication and socialization with peers was the most prevalent challenge for students. Limitations in the selection of teaching methods used in the classroom, less coverage of curriculum and program content, lack of technological skills, more time spent in front of screens preparing lessons, and providing feedback on student work through communication with parents were cited as difficulties by teachers. The results indicated that 57% of pupils were pleased with the organization of online instruction. Traditional modes of instruction were preferred by students over online instruction. Students'

overall satisfaction was related to teachers' interactions with them. It is intriguing that students in grades 3 to 6 preferred online learning. Students tend to favor traditional forms of education, according to a different study (Sathishkumar et al., 2020), but they recognize the benefits of online education.

In summary, the pandemic introduced a number of technological, educational, psychological, physiological, organizational, and ethical obstacles to the educational process (Kuzmanović, 2022a). Given that online education entails drastically changed conditions of classroom instruction and necessitates a distinct conceptualization of the entire educational system, it must be treated under special circumstances. The findings of numerous studies can be used to show the advantages and disadvantages of online education and to create a deeper understanding of this issue, which remains important given the current pandemic conditions. As students actively shape their own lives and experiences, it is important to examine how they perceive instruction (Kovács Cerović, Mićić, Vračar, 2021).

Teaching experiences from the perspectives of pupils, teachers, and parents are presented in qualitative studies based on teaching experiences in elementary schools around the world. A content analysis of elementary school students' and their parents' experiences in Turkey during the pandemic reveals that parents are struggling to adapt and that students' academic performance is declining as they turn to digital entertainment media due to school closures. Students indicated that they need more communication with teachers (Erol & Erol, 2020). However, a greater number of qualitative studies identified teachers as one of the most influential factors in online learning. Experiences with online teaching, experiences and difficulties in teaching different subjects (Fauzi & Khusuma, 2020; Sarı & Saralar Aras, 2022), planning, implementation and assessment of learning, collaboration with parents, use of the Internet (Fauzi & Khusuma, 2020), pressures related to personal and professional roles, and concern for student welfare (Robinson et al., 2023) are just some of the issues that have been explored using a qualitative approach. According to research, collaboration between teachers, parents, and schools affects student achievement (Rasmitadila et al., 2020). Teacher responses indicate that online learning is based on a simplified curriculum that focuses on the competencies that students need to be taught, and that synchronous learning relies on the Zoom platform, while variations of asynchronous learning are conducted using Google Classroom and students receive feedback via apps (Viber, WhatsApp) (Herwin et al., 2021). As this has been an extremely challenging time for all stakeholders in the educational process, the authors of one study emphasize the significance of parental support and involvement, improving the digital literacy of all stakeholders (students, parents, and teachers), and enhancing communication between schools and families (Marchant et al., 2021).

Prior qualitative research addressed the experiences of teachers, parents, and students, the use of modern technologies, and the organization of instruction, but the experiences of elementary school students remained unexplored because they were

primarily viewed from the perspective of teachers or parents. Consequently, the aim of this paper is to comprehend the experiences of students under altering classroom organizational conditions.

How do fifth graders experience instruction during the pandemic that is substantially different from what they are accustomed to? - was the central question of this study.

2. Methodology

Research design

This study is a component of a larger qualitative investigation on the perspectives of parents, instructors, students, and students in relation to online and blended (online and classroom) education in the Republic of Serbia during the pandemic (first half of 2020). The authors that planned and conducted the broader research (Mićić, Vračar & Skočajić, 2020; Mićić, Vračar & Kovács Cerović, 2020; Vračar, Mićić, & Simić, 2020) reported certain findings that were obtained as a result of the aforementioned research in their publications. In order to fully understand how the state of emergency affects the educational process as a whole, qualitative studies are especially important (Mićić, Kovács-Cerović, Vračar, 2021; Kuzmanović, 2022a). It moreover provides relevant viewpoints and interpretations of the research participants (Willig, 2016). The use of narratives in research yields significant insights (Daiute et al., 2020), which is where qualitative research is used in the investigation of complex phenomena related to the experiences and specificities of individuals that have not received enough attention (Popadić, Pavlović, Žeželj, 2019). We have selected this approach because the phenomena we are addressing in this study are recent and call for more in-depth analysis and justifications. The approach is based on a qualitative analysis of children's narratives about how the pandemic altered their experiences in school. We applied dynamic storytelling design (Daiute & Kovač-Cerović, 2017).

Participants

In total, 100 5th graders (60 girls and 40 boys) took part in the study and responded to an online survey regarding their experiences in school during the pandemic. After obtaining parental consent for student participation in the study, school psychologists and teachers distributed the link to the online survey. Additionally, taking part in the study was entirely voluntary. The broad-based study's objective was to compile a sample of participants from different regions and parts of Serbia, as well as individuals of various genders, ages, educational levels, and school types (Kovács Cerović et al., 2022). Students from the fifth grade of elementary school were selected for this study because they are beginning adolescence, a period of developmental crisis that causes changes in various aspects of development, as well as the beginning of a new level of schooling (moving from a lower to a higher grade and a different level of education). Due to the dual demands for

adaptation that fifth grade students must meet—one from the developmental crisis and the other from a new school level—we felt it was crucial to focus on them because doing so can be particularly difficult when combined with the demands of attending school in a pandemic.

Instruments

Responses were collected at the end of the fall 2020/21 semester, when most schools were transitioning to the hybrid model (December 2020). The questionnaire consisted of open-ended instructions to create a narrative following the dynamic storytelling approach (Daiute & Kovács Cerović, 2017) through two questions. First: *School began a few weeks ago, and we know that classes are now a little different than usual: some students attend class in shifts, follow a portion of their lessons from home, and communicate with their teachers using a variety of online platforms... Please describe an event related to teaching that left you with a lasting impression, that you pondered for a long time, or that you found particularly fascinating, and then: reflect on the event you just described. What, if anything, was good or positive about it? What, if anything, was bad or negative?* Grade level, gender, and school name were the demographic variables. The researchers received the anonymous responses without any assistance of the teachers or school psychologists.

Findings of the study were processed in several phases: Phase 1: Familiarization with the data; Phase 2: Generating initial codes; Phase 3: Searching for themes; Phase 4: Discussion of themes; and Phase 5: Defining and labeling themes.

Data analysis

The coding procedure was conducted using MAXQDA 2022 software (VERBI Software, 2021). [4]Coding involved dividing data into meaningful categories (Tuckett, 2005), with codes more finely defined than the theme itself. Codes refer to the characteristic content of data that refers to significant data or information that can be evaluated and meaningfully associated with a phenomenon (Bojacis, 1998, according to Braun and Clarke, 2006).

Considering the change in the instructional model during the pandemic in schools in the Republic of Serbia (Kuzmanović, 2022a), students were given a description of said transition from online to the blended (online and face-to-face) instructional model: *The school has only recently opened, but we already know that the teaching methods are slightly different than usual: some students attend classes in shifts, attend some classes (online) at home, and collaborate with their instructors using a variety of online tools.* Students were then asked to describe a class-related experience that left a lasting impression on them, that they thought about for a long time, or that they found fascinating, and to clarify what was positive/good or negative/bad about that event.

[4] Serial number: MQPO20-EFtXwK-b6Pjcx-3OWKhM-WkHFjB

3. Results

Students described experiences that occurred during online and face-to-face instruction, i.e., in-class instruction. A significant event that students described was moving up grades, meeting new teachers, and learning new subjects. The following codes were chosen based on responses in which students reported an event that had a profound impact on them: *changing classroom settings, online classes, Google Classroom, subjects, teachers, and I have no impression.* Their evaluations of the positive or good and negative or bad aspects of the event included feedback about *the beauty of fifth grade, Google Classroom, teachers, friends, waking up early, parents, and blended instruction (online and in-person, in the classroom).*The main themes that best reflected students' responses to the first question were chosen, and these were *the combined instruction model (online and face-to-face or classroom instruction) and the transition from classroom to subject instruction*. This choice was made under the guidance of the rule that initial codes create main themes and subthemes, while others can be discarded (Braun and Clarke, 2006). The chosen positive/good or negative/bad impressions of the events were the primary subjects of the second inquiry.

Table 1. Findings

Thematic category	*Narrative category*
Blended Learning Model	Online
	Face-to-face
Transition from classroom instruction to subject instruction	getting to know teachers
	learning new subjects
Opinions regarding the event	positive/good impressions of the described event
	negative/bad impressions of the described event

Blended learning model

The "Blended Learning Model" theme (online and direct or face-to-face instruction) refers to the different pandemic-related teaching conditions, in particular to the current instructional model of the Republic of Serbia at the time of data collection (first half of 2020). *Online and face-to-face instruction*, two forms of instruction that were interchangeable in schools under the blended learning model, form the subthemes. Indeed, in the 2020-21 school year, the Republic of Serbia structured instruction in several ways, including entirely online (through distance learning) and using the blended model (one day at home and one day at school) (Kuzmanović, 2022a). Students were divided into two groups within the class and received blended instruction. The groups

take turns attending face-to-face classes on different days of the week (one group goes to school three days a week, the other group two days a week). On the days they are not in school, they attend online classes with teachers in addition to face-to-face instruction (i.e., learning materials are usually sent through various platforms). In their responses, students most frequently provided examples of scenarios that demonstrate the advantages and disadvantages of the blended learning model.

Online instruction

The instances cited by students involved participation in class via television and participation in class via video conferencing software (Google Classroom, Zoom, Viber). When attending classes via TV, students are bothered by waking up/getting up early, the inconsistency between TV and the assignments they receive from the teacher, and the inability to see and socialize with other children.

- I don't like having to get up early to watch TV lessons. I'm always tired and it's more difficult to watch them because I'm sleepy.

- One day I followed the lesson on TV. The teacher of TV did a good job of teaching, and I wrote it down in my notebook. My teacher at school covered a different topic in the same subject. I wrote it all down too. I didn't know what to learn and what not to learn since I was confused.

In the online learning environment, students followed lessons through a variety of learning platforms in addition to TV channels. Students reported using the *Google Classroom* platform, which, despite being initially unfamiliar, was assessed as really fascinating and beneficial for exchanging information with teachers. Students also mentioned using Viber groups and the Zoom app together with their teachers.

- Although I found Zoom classes to be interesting, we still weren't able to learn as much as we could have in-person at school.

- Google Classroom has fascinated me, at first I didn't like it so much because I didn't know how to send homework, plus I could only track a few subjects in Google Classroom, but now I find it more interesting!

- The teachers don't have time to explain to us what the other group is doing. And the lessons on TV don't coincide with the lessons in school.

Parents took part in the learning process during the online classes by assisting their children with the material, using the online platforms, and completing online review tasks.

- We were instructed to upload (post) a document to Google Classroom. I did not want to do it and was stressed about whether I would be able to post it on time. When my dad arrived, we sent the document. And it was much easier for me.

- I can only say that my mom works with me a lot and it's funny how she struggles with the German language because no one really knows how to help me.

Face-to-face instruction

Students notably favored face-to-face instruction, or classroom instruction, to online instruction from home, according to their replies about online instruction. This was due, in part, to the fact that, unlike teachers at school, parents could not provide them with appropriate explanations at home. Students were unable to interact with their classmates in person during online classes.

- Now that we attend school every other day, I gave it a lot of thought. But when we started and after the first week, I saw that it was easier to work and that I had enough time to do homework and study.

- The most interesting thing to me was when we all came back together after a month of working in two groups. There aren't that many of us in the class, so it is best when we are all together. School is made up of friends and teachers, and working from home can't replace that.

- Learning at home is not the same as learning at school because the teachers can assist you with everything when you are in school. I receive a better explanation at school than I do at home.

Transition from classroom instruction to subject instruction

This group of children moved from a lower to a higher grade at the same time that the classroom organization model changed. The subthemes *of getting to know teachers and learning new subjects* stood out. Getting to know the teacher, the teacher's personality, and finding the subject interesting were what students most frequently cited as an event involving the teacher.

- Since I started the 5th grade of elementary school this year, the most interesting thing for me was getting to know the teachers. I thought they would be stricter now that we are older, but I was wrong. In their own way, everyone is good. They're very nice and patient with us. This has made a big impression on me, and I'm looking forward to getting to know the teachers in the years to come!

-All of the classes are very interesting to me, but the computer science class made the biggest impression on me because we had never used computers in school before.

- After the history lesson, I thought a lot about who we are, what we are, how we got to be what we are, and what happened in the past.

Opinions regarding the event

Children were asked *to explain what was positive/good and what was negative/bad about the event* they had just described in the second question. The two main themes *are positive/good impressions of the described event and negative/bad impressions of the described event*. According to the responses, students tended to rate events related to the shift from classroom to subject teaching highly, while they gave less favorable ratings to

events related to the changes in the instructional model brought on by the coronavirus pandemic.

The children in this study experienced positive emotions as they progressed from lower to upper grades (students indicated that teachers were interesting, pleasant, and good, both personally and in the delivery of instruction). Students also expressed how enjoyable and fascinating they found classes in novel disciplines like biology, history, and computer science. Returning to the classroom (though not every day) and discovering new and exciting technologies for sharing materials between teachers and students are positive aspects of the blended learning paradigm (e.g., Google Classroom).

- Being able to spend time with my friends and get to know the teachers was pleasant for me.

- We had been apart for a while, so it was fantastic to be back together.

The classes are shorter and students attend in groups so that the group that isn't in class that day can still follow the class online. These are the drawbacks that students see in the blended learning model.

- The bad news is that I occasionally don't know what to study, when to study it, or what to follow. Is it the tv, the classroom, school, or the Viber group?

-Going to school every other day feels weird.

4. Discussion

School is one of the most important systems for the development of children and adolescents, particularly for psychosocial development and optimal functioning. Identity is gradually developed through classroom participation, forming and maintaining relationships with teachers, and interacting with peers (Dahl, Allen, Wilbrecht, Ballonoff Suleiman, 2018). The pandemic experience impacts the developmental trajectories of children and adolescents (Velez, 2021) and has long-term effects on students' acquisition of cognitive and socioeconomic skills (Sternadel, 2021), as well as a variety of negative consequences for the educational process and its outcomes. Various authors from around the world have conducted research that points to a variety of challenges that students experience during the educational process under pandemic conditions at different school levels (Reimers, 2022). The findings of this study highlight some of these. Classroom organization and adherence to safety precautions were two issues cited by students. Participants in this study are at the very beginning of adolescence (Minić, 2019), and as they move from lower grades to higher grades, they experience significant developmental changes in several personality traits in addition to the requirements for adaptation (Vasta, Haith, Miller, 2005). The transition from lower elementary school to upper elementary school represents a significant turning point in the education of fifth graders in the Republic of Serbia, who constitute the sample for this study. In contrast to the lower grades, there is an innovation in that children now have a new subject teacher for each subject as well as a homeroom teacher. Additionally, they study a greater variety of subjects and are introduced to some of them for the first time (e.g., biology, history,

geography, etc.). Due to the changes mentioned above, it can be difficult for students to transition from classroom instruction to subject instruction. Given the new, pandemic conditions in education, students are also expected to report on current practices and discuss the advantages and disadvantages of this structured instruction.

The majority of students in this study preferred face-to-face instruction, i.e., classroom instruction, to online instruction. The findings obtained in this study indicate that students prefer face-to-face teaching methods and want classes to resume as they did before the pandemic outbreak. Students preferred face-to-face instruction because they are used to spending time with their friends and teachers at school, which is confirmed by other research (Putri et al., 2020) that states that while online learning allows students to meet virtually with friends and teachers, it is a form of inconvenient interaction. Despite concerns and anxiety about their health and the possibility of infection, the findings reinforce Komlenić and Keljanović's (2021) research findings that respondents prefer face-to-face (classroom teaching) instruction to online instruction. The conclusions are consistent with those of the study conducted in the Republic of Serbia in the school year 2020/21. In particular, the findings of the above-mentioned study show that students, as well as their parents and teachers, believe that face-to-face instruction or classroom instruction before the pandemic was better organized, of higher quality, and more beneficial than online instruction and blended instruction (online and face-to-face instruction or classroom instruction) (Kuzmanović, 2022a). Students need more time to adjust to distance learning, and teachers must exert greater effort to be comprehended by students, compared to face-to-face instruction. The lack of contact with peers and the experience of switching from face-to-face to online teaching are also mentioned by other researchers in Serbia (Mićić, Vračar, Skojačić, 2021) who additionally note that students are overburdened with assignments and express frustration due to an abundance of learning platforms. The findings are consistent with those of other researchers and can be attributed to a number of issues and shortfalls that plagued the online instructional approach to the pandemic. Moodiness in children, the conditions of learning from home and the lack of a working atmosphere in homes, changing teaching platforms, technical problems, inadequacy of teachers, and high expectations and demands from teachers[5] were identified as the most common problems in online learning, according to data collected during the analysis of the impact of the Covid 19 pandemic on families with children in Serbia in June and July 2020. The majority of parents of children aged 7-17 who participated in the above research believe that attending school during the pandemic will have a detrimental effect on their children's future education, that online learning has reduced children's motivation, and that the quality of learning is poor. The main disadvantages of online teaching are the lack of face-to-face interaction and the inability to conduct practical exercises effectively (Arsenijević, 2021). Online instruction enables teachers to ensure that all students receive the same education (Radha et al., 2020),

[5] https://www.unicef.org/serbia/publikacije/istra%C5%BEivanje-o-uticaju-pandemije-kovida-19-na-porodice-sa-decom-u-srbiji

although the majority of students still prefer face-to-face instruction despite the advancement of technology and the availability of numerous online courses. Face-to-face instruction is preferred by students because it is more realistic and gives them the opportunity to discuss and debate with instructors and peers. Children spend more time in front of a screen, which is a disadvantage of online education. Students receive learning materials that teachers upload to learning platforms (Google Classroom) and share any additional information via Viber groups.

The findings of this study also suggest that teachers were unprepared for the use of new educational technologies in the classroom and for the changing classroom conditions during the pandemic. The findings indicate that there were difficulties in organizing and delivering instruction during the pandemic. These findings are consistent with other studies that found that there were many problems of a technical nature in the changed conditions of school teaching during the pandemic, characterized by limited electronic resources, but also by insufficient training of teaching staff in the use of technical devices (Ruzafa-Martínez, 2020; Kuzmanović, 2022a; Braslauskienė et. al, 2022). This highlights the need for faculty and student competence development for online teaching and the provision of digital resources for teaching and learning, particularly for those students for whom this is not yet the case (Kovács Cerović, Mićić, & Vračar, 2021). Numerous authors point to the necessity for ongoing professional development for teachers (Baksa, & Luić, 2020; Sternadel, 2021), ongoing training in the use of technology (Paudel, 2021), and the provision of systemic support in the use of digital tools and various educational resources. Baksa & Luić (2020) provide a number of recommendations that could improve instruction, such as creating of more realistic schedules, the reduction of subject matter, the improvement of study skills and the promotion of work habits, and the establishment of clear criteria for students who do not consistently meet the requirements. TV lessons are possible as a temporary solution in extraordinary circumstances. Still, TV lessons cannot be a substitute for classroom teaching or online teaching because it contradicts the basic theoretical principles of learning (one-way "interaction", transmission of knowledge, absence of feedback, passivation of students, and absence of individualization) (Kuzmanović, 2022a). TV lessons are suitable for those students who cannot attend classes in any other way (e.g., children who do not own digital devices and the Internet). In addition, the lessons are recorded, stored, and available online for students who cannot watch them in real time or want to watch them more than once.

Conclusion

The findings obtained can be used as an important guide for further studies on this topic and as the foundation for implementing effective intervention and/or prevention strategies. The findings can contribute to a better understanding of the adjustments made to the educational process during the pandemic by focusing on both the benefits and the drawbacks identified, with the aim of improving the benefits and eliminating or

mitigating the drawbacks. We can take some preventive measures for future emergencies (such as various natural disasters, wars, etc.) by understanding the implications of teaching during a pandemic on the educational process, and then we can continue to implement the parts of online teaching that are critical to students' progress in the educational process. Considering that online education can be a significant alternative to the traditional way of learning (Paudel, 2021), it is important to make online instruction more appropriate and improve its outcomes. Based on the findings of this research, this can be achieved in part by more frequent evaluation of the advantages and disadvantages of online instruction from the students' perspective, and continued training and support for faculty and students in the use of various digital tools. The narratives of the students are a resounding appeal for a better organization of instruction in the future, for innovative use of digital technology, and for a greater emphasis on peer interaction. Considering that the findings of this study were obtained from students facing a variety of adaptation requirements (in addition to the pandemic conditions in school, there are adaptation requirements due to the developmental crisis and the transition to a higher level of education), we believe it is important to consider the given recommendations, as they would assist students in responding as appropriately as possible to the given situation and adapting quickly.

References

Adedoyin, B.O. & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities, *Interactive Learning Environments*, DOI: 10.1080/10494820.2020.1813180

Antonio, A., Astin, H., & Cress, C. (2000). Community service in higher education: A look at the nation's faculty. *Review of Higher Education, 23*(4), 373-398.

Aucejo, M, E., French, F. J, Ugalde Araya, M.P. & Zafar, B. (2020). The Impact of COVID-19 on Student Experiences and Expectations: Evidence from a Survey NBER Working Paper No. 27392. JEL No. I2, I23, I2.

Arsenijević, J., Mađarev, M., Markov, Z., Šapić, R., Planjanin Simić, K. (2021). Kvalitet online nastave visokog obrazovanja u vreme pandemije Covid-19. Kikinda: Visoka škola strukovnih studija za obrazovanje vaspitača.

Arsenijević, J. (2021). Neki aspekti online nastave visokog obrazovanja tokom pandemije Covid – 19. U Arsenijević, J., Mađarev, M., Markov, Z., Šapić, R., Planjanin Simić, K. *Kvalitet online nastave visokog obrazovanja u vreme pandemije Covid-19* (13- 23). Kikinda: Visoka škola strukovnih studija za obrazovanje vaspitača.

Baksa, T., & Luić, L. (2020). From face-to-face to remote learning in times of Covid 19 crisis in Croatia. ICERI2020 Proceedings, 9318-9326. https://doi.org/10.21125/iceri.2020.2067

Braslauskienė, R., Jacynė, R., Norvilienė, A., Ramanauskienė, S., Strazdienė, N. (2022). Changes in the organization of the educational process during the Covid-19 pandemic period: analysis of pre-school teachers' experiences. *IJERI: International Journal of Educational Research and Innovation*, (17), 121–134. https://doi.org/10.46661/ijeri.6475

Braun, V., Clark, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology,* 3 (2). pp. 77-101.

Cachón-Zagalaz, J., Sánchez-Zafra, M., Sanabrias-Moreno, D., González-Valero, G., Lara-Sánchez, A. J., & Zagalaz-Sánchez, M. L. (2020). Systematic Review of the literature about the effects of the COVID-

19 pandemic on the lives of school children. *Frontiers in* Psychology, 11:569348. https://doi.org/10.3389/fpsyg.2020.569348

Dahl, R., Allen, N., Wilbrecht, L., Ballonoff Suleiman, A. (2018). Importance of Investing in Adolescence from a Developmental Science Perspective. *Nature*. 554: 441. https://doi.org/10.1038/nature25770

Daiute, C., & Kovač-Cerović, T. (2017). *Minority teachers: Roma in Serbia: Narrate education reform*. Institute of Psychology.

Daiute, C., Kovács Cerović, T., Mićić, K., Sullu, B., & Vracar, S. (2020). Dynamic values negotiating geo-political narratives across a migration system. *Qualitative Psychology.* https://doi.org/10.1037/qup0000166

Erol, M., & Erol, A. (2020). Primary School Students Through The Eyes Of Their Parents During Covid-19 Pandemic. *Milli Egitim*, 49 (1), 529-551. https://doi.org/10.37669/milliegitim.766194

Fauzi, I., & Sastra Khusuma, I. H. (2020). Teachers' Elementary School in Online Learning of COVID-19 Pandemic Conditions. *Jurnal Iqra': Kajian Ilmu Pendidikan*, *5*(1), 58–70. https://doi.org/10.25217/ji.v5i1.914

Gore, J., Fray, L., Miller, A., Harris, J., & Taggart, W. (2021). The impact of COVID-19 on student learning in New South Wales primary schools: An empirical study. *The Australian Educational Researcher*, 48 (4), 605–637. https://doi.org/10.1007/s13384-021-00436-w

Hermanto, B.Y, Srimulyani, A.V. (2021). The Challenges of Online Learning During the Covid-19 Pandemic. *Jurnal Pendidikan dan Pengajaran* Vol. 54. No.1. pp 46-57 https://ejournal.undiksha.ac.id/index.php/JPP/article/view/29703

Herwin, H., Hastomo, A., Saptono , B., Ardiansyah, A. R., & Wibowo, S. E. (2021). How elementary school teachers organized online learning during the Covid-19 Pandemic?. *World Journal on Educational Technology: Current Issues,* 13(3), 437–449. https://doi.org/10.18844/wjet.v13i3.5952

Komlenić, A., Keljanović, A. (2021). *Kada zdravlje nije samo u našim rukama: stav prema pandemiji Covid-19, prema radu na daljinu i učestalost simptoma poremećaja psiho-fizičkog zdravlja.* Simpozijum na naučnom skupu sa međunarodnim značajem „*Savremeni trendovi u psihologiji*" održan 28-30 oktobra 2021. u organizaciji Filozofskog fakulteta Univerziteta u Novom Sadu, str. 78-80. ISBN 978-86-6065-677-5

Kovács Cerović, T., Mićić, K., & Vračar, S. (2022). A leap to the digital era-What are lower and upper secondary school students' experiences of distance education during the COVID-19 pandemic in Serbia? *European Journal of Psychology of Education*, 37 (3), 745–764. https://doi.org/10.1007/s10212-021-00556-y

Kuzmanović, D. (2022a). *Formalno obrazovanje u Srbiji tokom pandemije koronavirusa: nalazi istraživanja i preporuke*. Užice: Užički centar za prava deteta. https://ucpd.rs/publikacije/

Кузмановић, Д. (2022b). *Оцењивање у дигиталном окружењу – водич за наставнике.* Београд: Propulsion, Завод за вредновање квалитета образовања и васпитања и Дигитална Србија.

Marchant, E., Todd, C., James, M., Crick, T., Dwyer, R., & Brophy, S. (2021). Primary school staff perspectives of school closures due to COVID-19, experiences of schools reopening and recommendations for the future: A qualitative survey in Wales. *PLOS ONE*, 16 (12), e0260396. https://doi.org/10.1371/journal.pone.0260396

Mićić K., Kovács-Cerović T., Vračar S. (2021). Trends in primary school teachers' experience over the first year of the COVID-19 pandemic in Serbia: A narrative analysis. *Psihološka istraživanja* 2:163-182. https://www.ceeol.com/search/article-detail?id=1006277

Mićić, K., Vračar, S., & Kovács Cerović, T. (2020). Kakva je ovo nova škola i kako da se snađem u njoj: učenička perspektiva nastave na daljinu za vreme vanrednog stanja 2020. godine u Srbiji. Saopštenje sa naučnog skupa 68. Kongres psihologa Srbije „Psihologija iz dana u dan: Svakodnevni problemi u praksi psihologa i primena psihologije u svakodnevnom životu".

Mićić, K., Vračar, S., & Skočajić, M. (2020). Students' experiences of online schooling during the 2020 Spring lockdown in Serbia. [Conference presentation abstract]. 16th International Conference Days of applied psychology 2020, Niš. https://www.psihologijanis.rs/dpp/arhiva/DPP2020.pdf

Mseleku, Zethembe. (2020). A Literature Review of E-Learning and E-Teaching in the Era of Covid-19 Pandemic. International Journal of Innovative Science & Technology. 5. 588-597.

Paudel, P. (2021). Online Education: Benefits, Challenges and Strategies During and After COVID-19 in Higher Education. *International Journal on Studies in Education.* Vol 3, No 2, 70-85.

Popadić, D., Pavlović Z., Žeželj, I. (2018). *Alatke istraživača*. Beograd: Clio

Prodović Milojković, B. (2021). Change of Cultural and Value Matrixes in the Pandemic Age. In: *Thematic Collection of Papers of International Significance: Psychology of disaster, state of emergency and their effects on health* (23-49). Kosovska Mitrovica: University of Priština, Faculty of philosophy https://drive.google.com/file/d/11ax7LaCLTzI8S2WxI7znKDvFMLME-WQA/view

Putri, R. S., Purwanto, A., Pramono, R., Asbari, M., Wijayanti, L. M., & Hyun, C. C. (2020). Impact of the COVID-19 Pandemic on Online Home Learning: An Explorative Study of Primary Schools in Indonesia. *International Journal of Advanced Science and Technology*, 29(5), 4809-4818. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/13867

Radha, R., Mahalakshmi, K., Sathish Kumar, V., & Saravanakumar, A. R. (2020). E-Learning during Lockdown of Covid-19 Pandemic: A Global Perspective. *International Journal of Control and Automation*, 13(4), 1088-1099. Retrieved from http://sersc.org/journals/index.php/IJCA/article/view/26035

Rajović, R., Davidivić Rakić, J., & Erdeš- Kavečan, Đ. (2021). Burnout and life satisfaction of teachers in the Repablic of Slovenia during the crisis caused by the Covid- 19 pandemic. In: *Thematic Collection of Papers of International Significance: Psychology of disaster, state of emergency and their effects on health* (pp. 331–357). University of Priština, Faculty of philosophy. https://drive.google.com/file/d/11ax7LaCLTzI8S2WxI7znKDvFMLME-WQA/view

Ramos-Morcillo, A. J., Leal-Costa, C., Moral-García, J. E., & Ruzafa-Martínez, M. (2020). Experiences of Nursing Students during the Abrupt Change from Face-to-Face to e-Learning Education during the First Month of Confinement Due to COVID-19 in Spain. *International Journal of Environmental Research and Public Health*, 17(15), 5519. https://doi.org/10.3390/ijerph17155519

Rasmitadila, R., Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). The Perceptions of Primary School Teachers of Online Learning during the COVID-19 Pandemic Period: A Case Study in Indonesia. *Journal of Ethnic and Cultural Studies*, 7(2), 90–109. https://doi.org/10.29333/ejecs/388

Reimers, F. M. (Ed.). (2022). *Primary and Secondary Education During Covid-19: Disruptions to Educational Opportunity During a Pandemic*. Springer Nature. https://doi.org/10.1007/978-3-030-81500-4

Robinson, L. E., Valido, A., Drescher, A., Woolweaver, A. B., Espelage, D. L., LoMurray, S., Long, A. C. J., Wright, A. A., & Dailey, M. M. (2023). Teachers, Stress, and the COVID-19 Pandemic: A Qualitative Analysis. *School Mental Health*, 15(1), 78–89. https://doi.org/10.1007/s12310-022-09533-2

Sarı, M. H. & Saralar Aras, İ. (2022). A Case Study on Online Teaching during the Covid-19 Pandemic Perceived by Primary School Teachers. *International Journal of Psychology and Educational Studies*, 9 (2), 440-449. Retrieved from https://dergipark.org.tr/en/pub/pes/issue/69240/1096739

Scott, S., McGowan, V., Visram, Sh. (2021). 'I'm Gonna Tell You about How Mrs Rona Has Affected Me'. Exploring Young People's Experiences of the COVID-19 Pandemic in North East England: A Qualitative Diary-Based Study. *Int. J. Environ. Res. Public Health*, *18*(7), 3837. https://doi.org/10.3390/ijerph18073837

Степановић, С. (2020). Утицај пандемије вируса корона на образовање. *Настава и васпитање*, 2020, 69(2), 183-196. https://doi.org/10.5937/nasvas2002183S

Sternadel, D. (2021). „The impact of COVID-19 on student learning outcomes across Europe: the challenges of distance education for all'', NESET Ad hoc report no. 2/2021.

Stojanović, D. (2020). Analiza realizacije učenja na daljinu u Srbiji za vreme pandemiej virusa Covid 19. U „*Black Swan in the World Economcy 2020.* (Ur. Mitić, P, Marjanović, D.) Beograd: Institut ekonomskih nauka. str. 121-140.

Tarkar, P (2020). Impact Of Covid-19 Pandemic On Education System. *International Journal of Advanced Science and Technology* 29 (9), 3812-3814.

Tuckett, A. G. (2005). Applying thematic analysis theory to practice: A researcher's experience. *Contemporary Nurse*, 19 (1-2), 75–87. https://doi.org/10.5172/conu.19.1-2.75

Vasta, R., Haith, M., Miller, S. A. (2005). *Dječja psihologija*. Moderna znanost. Jasrebarsko: NakladaSlap.

Velez, G. (2021). School-Based Restorative Justice: Lessons and Opportunities in a Post-Pandemic World. *Laws.* 10: 71. https://doi.org/10.3390/laws10030071

Vračar, S., Mićić, K., Simić, N. (2020, Novembar 27-28). Onlajn univerzitetska nastava: perspektiva studenata iz Srbije. Saopštenje sa naučnog skupa 68. Kongres psihologa Srbije „Psihologija iz dana u dan: Svakodnevni problemi u praksi psihologa i primena psihologije u svakodnevnom životi"

Willig, C. (2013). *Introducing qualitative research in psychology* (3rd ed.). Open University Press.

Zheng, X., Zhang, D., Lau, E. N. S., Xu, Z., Zhang, Z., Mo, P. K. H., Yang, X., Mak, E. C. W., & Wong, S. Y. S. (2022). Primary School Students' Online Learning During Coronavirus Disease 2019: Factors Associated With Satisfaction, Perceived Effectiveness, and Preference. *Frontiers in psychology*, 13, 784826. https://doi.org/10.3389/fpsyg.2022.784826.

Teachers' activities that best encourage learning among students of preschool teachers' training college in Kikinda

Ana Vukobrat•, Srbislava Pavlov••, Angela Mesaroš Živkov•••

Abstract

Due to numerous reforms, modern teaching now asks for the role of the teacher to be redefined as well. One of the teacher's many tasks is to master the competencies which would enable them to encourage and stimulate their learners. In this article, authors report on a research conducted at Preschool Teachers' Training College in Kikinda, which aimed to contribute to a reflexive analysis of the role of the teacher in the context of contemporary teaching process. The goal of the research was to answer the question of which teachers' activities and strategies students at Preschool Teachers' Training College in Kikinda think best encourage the learning process. This question is also th research problem. Purposive and convenience sampling was used, and the sample consisted of students of Preschool Teachers' Training College (N=133). The instrument used in the research was the Excellent Faculty Member questionnaire by Jenrette and Napoli, 1994 (in Suzić, 2005, p. 861). The results obtained, frequency distribution and the mean of respondents' estimates reveal high scores on all the items. The highest rated items indicate that respondents have a high opinion on teachers' mastery of subject matter (M=3.857) and teachers' organization (M=3.857), but also on teachers giving feedback (M=3.805), listening to them carefully (M=3.789), respecting them (M=3.782) and maintaining high professional standards (M=3.767). The lowest rated item is related to teachers setting themselves challenging goals (M=3.436). Conclusions indicate that students find it motivating for learning when teachers exhibit mastery of subject matter, when their work organization is good, when they provide students with feedback, acknowledge and respect them while keeping in mind the students' abilities, skills, and previous knowledge, as well as when they are well prepared for the class and when they innovate the teaching contents. The students emphasized the importance of a positive emotional climate in the classroom to which humour, teacher-student relationship and challenging tasks and goals greatly contribute.[6]

Keywords: teachers' activities; encouraging learning; students.

• MA, Preschool Teachers' Training College in Kikinda, vukobrata@vaspitacka.edu.rs
•• PhD., Preschool Teachers' Training College in Kikinda
••• PhD., Preschool Teachers' Training College in Kikinda

[6] The paper was presented at the International conference "Contemporary Education 2022" held online, on April 2, 2022, and organized by the Alliance of Serbian Enlighteners and partners from the country and abroad.

1. Introduction

Education, regardless of its level, has gone through numerous reformational changes which further bring forth a redefining of the role of the teacher since the modern-day teaching process implies different roles that teachers take on. The teacher, especially at the level of higher education, is expected to be an organizer, a facilitator, a moderator and an innovator. In order to be able to carry out all these functions, the teacher needs to master a specific set of competencies and skills so they would successfully enable the learning process as well as question, change and perfect their behavioural style.

When it comes to the competencies of teachers in elementary and high schools, the document *Guidebook on standard competencies for the profession of teachers and their professional development* (Institute for Improvement of Education, 2011) lists five basic types of competencies: competence for the field of teaching, subject and methodology of teaching, competence for teaching and learning, competence for supporting students' personal development and competence for communication. If we were to add to this list and move on to the next level of education, competencies of teachers in higher education would be the following: didactic-methodical knowledge and research skills and communication competency and the competencies developed by the teachers as a result of new demands set before them as a consequence of technological development and new demands of the students (Waple, 2006, in Turk and Ledić, 2016). Analysing the university teachers' competencies further, Turk and Ledić (2016) list the following skills: planning and conducting classes; applying various methods of study pertaining to learning outcomes; understanding and applying theories on which the process of learning and teaching is based; applying various evaluation and grading procedures pertaining to learning outcomes; creating an environment which will motivate students to learn; applying techniques of active learning in the teaching process; educating students to become socially responsible and active citizens; effective conflict resolution and negotiation skills; knowledge and understanding of ethical standards in teaching and research; presentation skills and application of research results in the teaching process.

Changes in education, caused by different societal changes, demand that teachers constantly question their role in the educational process (Lalić-Vučetić, 2015; Trivunović, 2017; Vučinić and Antonijević, 2020). One of the broadest classifications of the teachers' roles implies the difference between the pedagogical and the educational sphere of teaching. By carrying out their pedagogical role, the teacher influences the overall development of a student's personality, while by carrying out their educational role the teacher helps the students acquire knowledge, skills, and habits (Joksimović and Stojiljković, 2007). Nenad Suzić designed a specific classification of teachers' roles. The main criterion for determining the various roles was the relationship between traditional and modern teaching, as well as the need to explore the didactic role of the teacher in a different approach to teaching and in a teaching process in which students are active participants. In this context, the author lists the following teacher's roles: teacher as a didactician; teacher as a pedagogue; scientist-teacher role; teacher as a diagnostician;

teacher as an instructor of active teaching; teacher as a coordinator; teacher as a creator of interpersonal relationships; teacher as a builder of the emotional climate in the classroom and teacher in goal-oriented active learning (Suzić, 2005). Therefore, the essence of the teacher's role and their significance in the educational process are reflected in the way teachers plan, prepare and carry out teaching activities, in the ways they motivate students to actively participate in the educational process, and in the amount of attention they pay to the development of effective communication and interaction with their students (Vučinić and Antonijević, 2020). In the analysis of the role of a teacher as a motivator for engagement in the educational process, three different orientations have been established in literature: orientation towards studying the connection between the teacher's personal traits and various aspects of the teaching process and their successfulness; orientation towards what the teacher does as a professional in school – carrying out the teacher's roles and mastering competencies needed for a successful fulfilment of numerous and complex roles in school, and orientation towards exploring the teacher factor in efficient teaching – the concept of class management (Lalić-Vučetić, 2015). A much more diversified view and classification of teacher's roles is given by Ivić, Pešikan and Antić (2001) – the teacher's role in a narrower sense (teacher as a lecturer; as an organizer of teaching, partner in pedagogical communication, expert in their field); motivational role (motivating students to work, enticing and maintaining interest, teacher as a model for professional orientation); the role of an evaluator (evaluation of knowledge, behaviour and the personality of students); cognitive-diagnostic role; the role of a regulator of the social relationships in the class as a group; the role of a partner in affective interaction. When analyzing the role of the teacher as a moderator of teaching in higher education, Trivunović (2017) also states that this role has undergone significant changes. Regardless of the fact that the focus of the educational process has recently been primarily on students, the role of the teacher remains very important. By redirecting the focus to the students, the reform has created new challenges for teachers and their attitude towards the teaching process and the students. In this way, the role of the teacher as a student's helper and assistant is the first to be activated, which brings the teacher into a roughly equal relationship with the students. Now their goal is no longer to merely mediate between knowledge and students, but to teach them the skills of setting appropriate goals, structuring time and activities, balancing personal aspirations and objective circumstances, as well as balancing expectations and limitations. Furthermore, Carless stresses that the teacher's role is to design a learning environment which provides students with a multitude of possibilities to make assessments and take action in response to feedback given by the teachers. Effective feedback processes need to involve partnership and shared responsibilities between students and educators underpinned by learner-focused feedback practices (Carless, 2020). On the other hand, providing feedback to students on their individual learning processes and correcting their mistakes in a constructive way

can improve a student's sense of competence (Deci & Rian, 2000, in Vieluf and Gobel, 2019).

If we were to support the new roles of teachers with theoretical perspectives, we would choose the critical-constructivist theory of Wolfgang Klafki's who dismisses the idea of once dominant traditional, frontal teaching in which organization, planning and carrying out of teaching activities are completely under the control of the teacher. According to the theory mentioned, teaching is an interactive process in which students are active participants (Glasersfeld, 1995, in Vučinić and Antonijević, 2020) who also take part in the process of planning and design the tasks together with their teacher, state their ideas, suggestions and conclusions. Building work relationships with teachers as partners in a community will contribute to the student's productive experience (Ali et al., 2018). That is why the teaching process needs to be characterized by democratic atmosphere, which implies effective communication, mutual respect, solidarity in organization, high level of students' motivation, and the development of critical thinking. In such a teaching process, learning is directed towards both teachers and students (Vučinić and Antonijević, 2020). Since student-teacher interaction needs to exist for the teaching process and learning to happen, Hadi, Dazrullisa, Susantini and Kuntjoro (2020) emphasize the role of the teacher as an agent of learning, i.e. as a facilitator, a motivator, a promoter, an instructor of learning and a source of inspiration for students. With the various new changes happening in the field of education, the trends concerning teachers' roles shift towards the method of active learning (Jagtap, 2016). Now the teacher is the facilitator of learning and needs to become the mentor and motivate students through various activities and learning procedures among which, according to Jagtap (2016), the method of active learning stands out. The method of active learning, according to the author mentioned, focuses on offering help in learning and making the process of knowledge acquisition easier, so if a teacher is in the position to create an environment for active learning, he will help the students learn in different ways. Teaching in the 21st century needs to be based on three pedagogical principles: personalization, participation and productivity, and an efficient teacher needs to possess a wide spectre of different models of teaching and learning, strategies and techniques, and must know how to create the right conditions for learning (Ali et al., 2018). However, Mondal and Das (2018) state that before the teacher gets to know their students well, as well as their individual strengths and needs, he can hardly know which methods would positively affect these students. Nevertheless, it is a fact that numerous strategies of active learning exist today, they are all based on the constructivist paradigm, and they all emphasize the importance of cooperative and experiential learning and well as connecting theory and practice (Koludrović, 2013).

When speaking of the curricular approach to higher education which starts from learning outcomes, i.e. defined competencies of graduate students, Kovačević (2001) emphasizes an important question of how students learn and what methods and procedures could guarantee knowledge acquisition in the process of learning. The

teacher has a great responsibility for their students' development and their support is needed during the process of learning and growing-up. Participation offers an adequate model through which this support can be given without the participation being necessarily in contradiction to the teacher's authority, because if authority is built on respect, understanding, sensitivity to students and their demands, partnership and constant encouraging of students' development, participation not only is not in contradiction to this type of authority but it supports and encourages it (Vranješević, 2005). It is clear that the educational effects also depend on the students, their abilities, motivation and other personal characteristics, but the teacher is the one who should transfer knowledge in an adequate way, create a good work climate, motivate and guide the students towards the set, predefined outcomes (Stojiljković et al., 2012). It is of great importance that the teacher works on their own development which, in addition to lifelong learning, also implies the development of the ability to create a harmonious relationship with their students through interaction, to meet their students' various needs and respect the diverse profiles of students.

Within this field of research great attention is directed towards studies which deal with questioning the teachers' activities and strategies which contribute to students' motivation for learning. Besides studying motivation, empathy of teachers has been explored as an important precondition for successful acquisition of knowledge in the process of learning. Accomplishment in learning can only be achieved if motivation and interest arise in a student, which implies that the role of a teacher as a motivator is an important topic that needs to be acknowledged (Hadi et al., 2020). Different processes can be efficient in raising motivation and interest in students in the sense of strengthening the students' predisposition for learning (Vieluf and Gobel, 2019). In this context, empirical research conducted by Lalić-Vučetić (2015) contributed to specifying procedures and activities teachers can use as an important potential in motivating students to learn. The procedures are represented through categories which represent relevant spheres of pedagogical and educational work of teachers. The categories are the following: incentives directed towards the development of students' confidence; teacher's incentives directed towards planning and students' self-evaluation (incentives directed towards teaching techniques for guided learning and students' self-evaluation); teachers' activities and students' behaviour in the teaching process itself (desirable teaching activities focused on developing internal motivation) and activities which will provide the teacher with a necessary self-insight into teaching. The analysis of pedagogical starting points and other relevant sources clearly points to the fact that teachers, most often as external motivators, through good interpersonal relationships with their students, can positively affect the process of motivating students to engage in the teaching process (Trumić, 2021). The results of the research carried out by Trumić (2021) confirm the starting assumption that the experimental programme, i.e. students' and teacher's engagement in the teaching process and their interpersonal relationships will affect the students' motivation, their involvement and the pedagogical climate in

school. The quality of the experimental programme was checked and based on research results it was determined that there is a statistically significant influence of students' and teachers' involvement and the quality of their relationships on the students' motivation, their involvement and the pedagogical climate in school. In addition, research on teachers' empathy conducted by Stojiljković, Stojanović and Dosković (2012) confirmed that there are differences in the levels of empathy in teachers employed in elementary, high, and higher education, as well as that elementary school teachers are more empathetical than the teachers working in high school and in faculties.

Smith (2021) writes that the professional role of a teacher can be explained through the defined standards and qualifications, whereas the very personality of a teacher is somewhat harder to assess since it depends on the teacher's most significant observers – their students. Chavez Rojas, Faure Ñiñoles & Barril Madrid (2021), according to Assunção Flores (2023) stress that the process of building the professional identity of a teacher is based on comparing and contrasting different experiences which culminate in building new identity positions of the teacher. Since there are no specific standards for measuring the quality of a teacher, their role is therefore not easy to concretize. Raufelder and associates (Raufelder, Bukowski, and Mohr, 2013, according to Smith, 2021) have found out that adolescents value the interpersonal dimensions of a teacher higher than the academic ones. Ulvik (2009, according to Smith, 2021) in his research concludes that the students' expectations from a teacher are realistic, given that they expect their teacher to easily communicate with them, understand them, employ various teaching methods and set high demands. Tomines and Mathiesen (2013, according to Smith, 2021) obtained similar results in their studies, and they thus emphasize that a good teacher manages their class well, is clear and well prepared for teaching, is flexible and capable of dealing with spontaneous situations appearing during the process of teaching.

In the end, it is important to differentiate the related notions of quality teacher and quality teaching (Sachs, 2016, according to Steadman & Ellvis, 2021). The quality of a teacher focuses on personality traits and performances of an individual, and the quality of the teaching process is related to the practice of a teacher (Churchward & Willis 2019, according to Steadman & Ellvis, 2021). However, a teacher's efficacy if often used as an indicator of a teacher's quality (Skourdoumbis, 2017, according to Steadman & Ellvis, 2021). There is also the term 'classroom ready teachers' (TEMAG 2014 according to Steadman & Ellvis, 2021) Olsen (2021) has also been working on reaching the answer to the question of what an excellent teacher looks like. In order to answer this question, it is important to first identify the skills, personality traits and behaviours which excellent teachers possess or demonstrate. Zbróg (2014) in that context emphasizes that a teacher is expected to play numerous roles while doing their job in an ever-changing environment, to apply new methodologies and techniques and meet the demands of the world. In this quite complex system, the role of the teacher is considered crucial. The way in which teachers shape their students, not only in the classroom but in the wider school environment as well is also important. In this context, the teacher as an agent of change

performs their many roles, consciously or unconsciously, thus enriching the repertoire through continuous professional development. The conscience of a teacher is important, i.e. the extent to which the teachers understand the roles they are expected to perform and how they understand the significance of the activities related to their professional development (Zbróg, 2014). Thus Lichtenstein, McLaughlin and Knudsen proposed the idea that the expansion of knowledge in a teacher plays the key role in their empowerment (Lichtenstein, McLaughlin and Knudsen, 1992, according to Zbróg, 2014).

Keeping in mind the theoretical and methodological support for the topic we have chosen, the research was conducted in order to try and identify the activities of teachers which the students have perceived as the most important in the process of learning. The contribution of our research can be found in providing a wider picture of the activities of teachers which best encourage our students to learn from the students' perspective. There are different studies which deal with the question of how excellent teachers work, and we wanted to further elaborate on this topic on the level of higher education.

2. Methodology

The main research method was nonexperimental – a survey on a sample. The paper title provides a preliminary definition of the research problem – activities of teachers which best promote learning among students at Preschool Teachers' Training College in Kikinda.

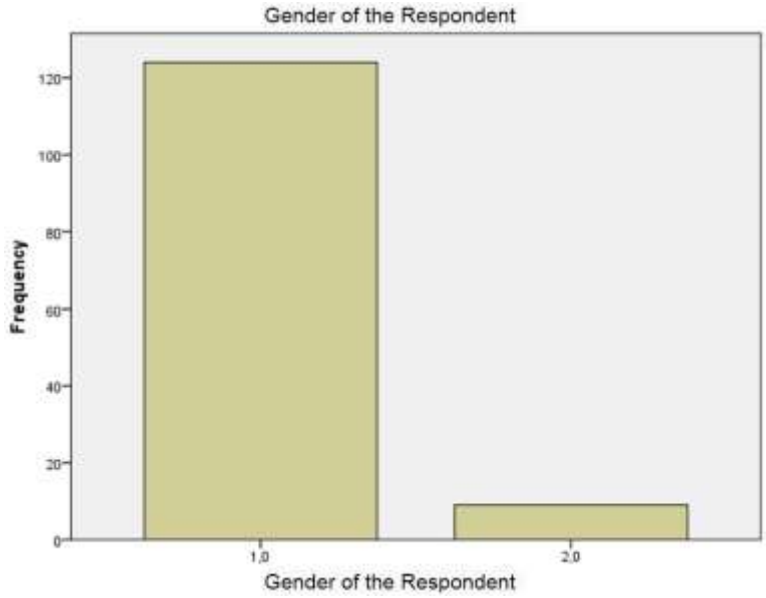
Keeping in mind the theoretical framework on the changed role of the teacher in modern-day education, we decided to conduct this research and answer the question of how the students of Preschool Teachers' Training College in Kikinda perceive their teacher's activities and behaviours which best promote the process of learning and knowledge acquisition. The given question is also the problem of our research.

The main goal of the research was to determine the students' perceptions on teachers' activities which best promote learning.

Research sample

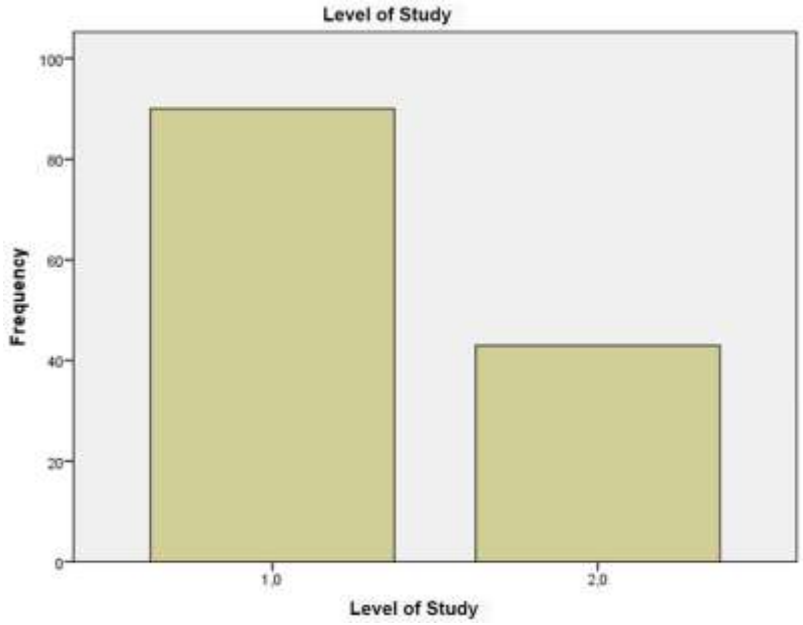
The sample consisted of 133 students at Preschool Teachers' Training College in Kikinda, undergraduates from two departments (Preschool Teacher and Preschool Teacher of Traditional Dance) and students of first and second year of master studies. The sample was purposeful and convenient, which is in accordance with the explorative nature of the research.

The research sample consisted of respondents of both genders – male and female. Of the total number of respondents, 124 (93,20%) reported their gender as female, and 9 (6,80%) as male (Graph 1). The calculated value of Chi square χ^2=99,436 (df=1) with statistical significance of p=.001 shows that the sample is not matched by gender (or sex?) of respondents.



Graph 1: Respondents' distribution by gender

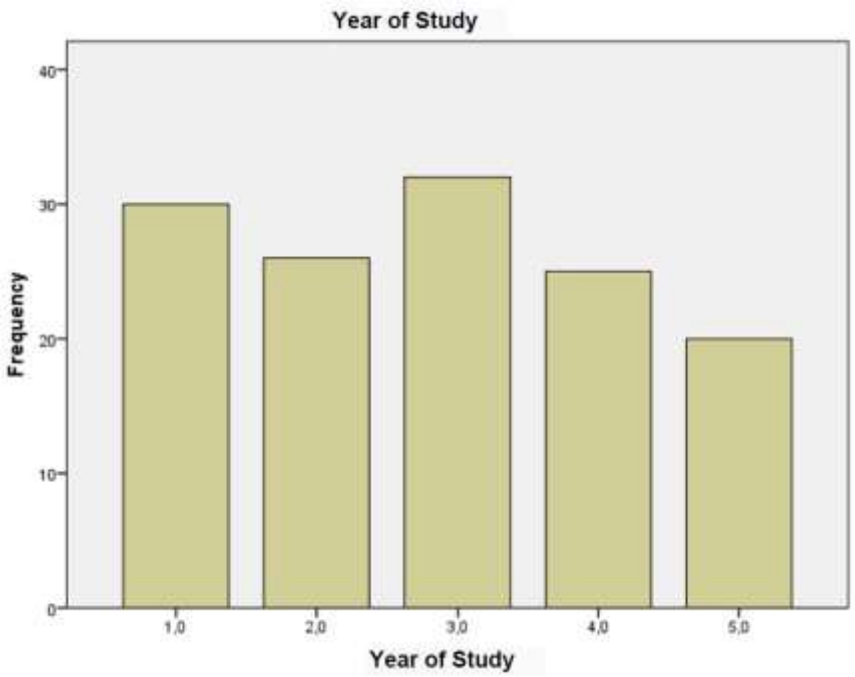
Of the total number of respondents, 90 (67,70%) reported their level of studies as undergraduate students and 43 (32,30%) as master's students (Graph 2). The calculated value of Chi square χ^2=16.609 (df=1) with statistical significance of p=.001 shows that the sample is not matched by level of studies.



Graph 2: Respondents' distribution by level of studies

When it comes to the sample structure by year of study, 30 (22,60%) of responded reported they are currently on the first year of undergraduate studies, 26 (19,50%) are currently on the second year of undergraduate studies, 32 (24,10%) are currently on the third year of undergraduate studies, 25 (18,80%) reported they are currently on the first year of master's studies, and 20 (15%) respondents reported they are currently on the second year of master's studies (Graph 3). The calculated value of Chi square χ^2=3,278

(df=4) with statistical significance of *p*=.512 shows that the sample is matched by year of studies.



Graph 3: Respondents' distribution by year of studies

Instrument

The instrument used in the research was the *Excellent Faculty Member* questionnaire by Jenrette and Napoli, 1994 (in Suzić, 2005, p. 861). The questionnaire consists of 28 items describing teacher's activities that best promote students' learning. The respondents rated the items on the scale of 1 to 4, where 1 is the lowest and 4 is the highest rating (Suzić, 2005, p. 861). The instrument has good internal consistency and the Cronbach's alpha coefficient is .955.

Research process and data processing

Research was carried out during February 2022, electronically, via Google questionnaire. Data collected were processed and analysed using IBM SPSS 21 software, and descriptive statistics was used to describe the data.

3. Research results

Table 1 shows frequency distribution (*N* and %) and the mean (*M*) for the items in the questionnaire *Excellent Faculty Member* (Jenrette & Napoli, 1994, in Suzić, 2005, p. 861).

Table 1
Students' answers on teachers' activities which best promote learning

Items **Excellent teachers…**	Min.	Max.	*M*	SD	Students' answers				Total
					1	2	3	4	
…are enthusiastic about their work.	2	4	3.609	.5619	0 (0%)	5 (3.8%)	42 (31.6%)	86 (64.7%)	133 (100%)
…present their ideas clearly.	2	4	3.759	.5098	0 (0%)	5 (3.8%)	22 (16.5%)	106 (79.7%)	133 (100%)
…are well prepared for work.	2	4	3.707	.5043	0 (0%)	3 (2.3%	33 (24.8%)	97 (72.9%)	133 (100%)
…exhibit mastery of subject matter.	2	4	3.857	.3722	0 (0%)	1 (.8)	17 (12.8%)	115 (86.5%)	133 (100%)
…are responsible towards the students' needs.	2	4	3.759	.5098	0 (0%)	5 (3.8%)	22 (16.5%)	106 (79.7%)	133 (100%)
…pose challenging tasks to students.	2	4	3.511	.6230	0 (0%)	9 (6.8%)	47 (35.3%)	77 (57.9%)	133 (100%)
…set themselves challenging goals.	1	4	3.436	.7319	2 (1.5%	13 (9.8%)	43 (32.3%)	75 (56.4%)	133 (100%)
…give corrective feedback quickly and directly.	1	4	3.594	.6400	2 (1.5%	5 (3.8%)	38 (28.6%)	88 (66.2%)	133 (100%)
… evaluate the students' progress fairly.	1	4	3.714	.5583	1 (.8%)	4 (3%	27 (20.3%)	101 (75.9%)	133 (100%)
…carefully listen to what the students say.	2	4	3.789	.4776	0	0	20 (15%)	109 (82%)	133 (100%)
…see their students as subjects that operate in a broader perspective than the classroom.	1	4	3.541	.6573	1 (.8%)	9 (6.8%)	40 (30.1%)	83 (62.4%)	133 (100%)
…are committed to the teaching profession.	1	4	3.737	.5207	1 (0.8%	2 (1.5%)	28 (21.1%)	102 (76,7%)	133 (100%)
…use teaching techniques which inspire intellectual courage.	2	4	3.624	.5721	0 (0%)	6 (4.5%)	38 (28.6%)	89 (66.9%)	133 (100%)
…respect different talents.	1	4	3.752	.5422	1 (.8%)	4 (3%)	22 (16.5%)	106 (79.7%)	133 (100%)
…show positive attitudes towards students' learning abilities.	2	4	3.722	.5273	0 (0%)	5 (3.8%)	27 (20.3%)	101 (75.9%)	133 (100%)
…treat their students with respect.	2	4	3.782	.4661	0 (0%)	3 (2.3%)	23 (17.3%)	107 (80.5%)	133 (100%)
…maintain high professional standards.	2	4	3.767	.4749	0 (0%)	3 (2.3%)	25 (18.8%)	105 (78.9%)	133 (100%)
…are available to students.	2	4	3.752	.5135	0 (0%)	5 (3.8%)	23 (17.3%	105 (78.9%)	133 (100%)

...expose students to diverse scientific perspectives.	1	4	3.617	.6363	1 (.8%)	8 (6%)	32 (24.1%)	92 (69.2%)	133 (100%)
...provide written evaluation criteria at the beginning of semester.	2	4	3.669	.5466	0 (0%)	5 (3.8%)	34 (25.6%)	94 (70.7%)	133 (100%)
...use teaching techniques which encourage independent thinking.	2	4	3.639	.5551	0 (0%)	5 (3.8%)	38 (28.6%)	90 (67.7%)	133 (100%)
...keep up-to-date with theory and practice and innovate the contents of the subjects they teach.	2	4	3.669	.5182	0 (0%)	3 (2.3%)	38 (28.6%)	92 (69.2%)	133 (100%)
...encourage students to be analytical listeners.	2	4	3.684	.5417	0 (0%)	5 (3.8%)	32 (24.1%)	96 (72.2%)	133 (100%)
...introduce students to alternative ways of learning.	2	4	3.624	.5852	0 (0%)	7 (5.3%)	36 (27.1%)	90 (67.7%)	133 (100%)
...possess a sense of humor which strengthens the teacher-student bond.	1	4	3.564	.6438	1 (.8%)	8 (6%)	39 (29.3%)	85 (63.9%)	133 (100%)
...keep accurate records of students' progress.	2	4	3.722	.5128	0 (0%)	4 (3%)	29 (21.8%)	100 (75.2%)	133 (100%)
...provide feedback to their students and others.	2	4	3.805	.4345	0 (0%)	2 (1.5%)	22 (16.5%)	109 (82%)	133 (100%)
...are well organized in their job.	2	4	3.857	.3920	0 (0%)	2 (1.5%)	15 (11.3%)	116 (87.2%)	133 (100%)

Frequency distribution (*N* and %) and the mean (*M*) of the respondents' answers shown in Table 1 indicate high scores on all the items. The highest rated items show that the respondents find the teachers' knowledge and organization equally encouraging for learning, which is indicated by the following items: excellent teachers *exhibit mastery of subject matter* (*M*=3.857), which was confirmed by the high percentage (86.5%) of the highest grade given and *are well organized in their job* (*M*=3.857) where 87.2% of respondents gave this item the highest grade.

Students highly rank the *fair* approach of their teachers in evaluating students' progress (*M*=3.714) with 75.9% of the highest grade, when the teachers *are well prepared for work* (*M*=3.707) with 72.9% of the highest grade, and when they *encourage students to be analytical listeners* (*M*=3.684) with 72.2% of the highest grade. The next items are also equally ranked, and they are: *provide written evaluation criteria at the beginning of semester* (*M*=3.669) with 70.7% of the highest grade, and *keep up-to-date with theory and practice and innovate the contents of the subjects they teach* (*M*=3.669) with 69.2% of the highest grade.

The item related to humour, *possess a sense of humor which strengthens the teacher-student bond* (*M*=3.564) was graded by our respondents with 63.9% of the highest grade. It was noticed that the item *see their students as subjects which operate in a wider perspective than the classroom* (*M*=3.541) received 62.4% of the highest grade, and *pose*

challenging goals to their students (*M*=3.511) 57.9%. The lowest ranked item is *set themselves challenging goals* (*M*=3.436) where it was noticed that the respondents graded this item with 56.4% of the highest grade.

4. Discussion

Starting from the research goal of determining how the students of Preschool Teachers' Training College in Kikinda assess the activities of their teachers which best promote learning, the results of the research conducted show that the respondents have a high opinion on teachers' knowledge and organization, because they believe that a teacher's subject matter knowledge and good organization are the aspects which best encourage students to learn. Students find it important that they get feedback from their teachers, but they also think highly of teacher-student relationship based on respect and appreciation. Other teachers' activities that encourage students to learn are providing proper and timely information, up-to-date contents and, therefore, innovation in content. In the teaching process, specific teaching methods are used to create the most favourable conditions for initiating the process of learning (Terhart, 2001).

Teacher's effort to encourage students to state their opinions freely and actively participate in task solving and goal achievement is also highly motivating for students. A high percentage of students emphasized the importance of a fair treatment by the teacher and a relationship in which their abilities are respected, and they are directed towards different ways of learning, as well as the importance of timely information on the progress and grading of each student. Respondents' positive answers confirm that the emotional climate in the classroom which depends on humour possessed and expressed by the teacher affects the motivation for learning and enables easier solving of the tasks given. Numerous authors have dealt with the benefits of using humour in teaching (Berk, 1988; Glemm, 2002, Hill, 1988; Pollio & Humphreys, 1996, according to Garner, 2006). The use of humour in the classroom directly contributes to a favourable emotional climate, opens up perceptive and affective channels for receiving new information, and in this sense, learning through humour is perceptively deeper and experientially stronger (Suzić, 1998). Krnjajić (2006) stresses that the main function of humour in teaching is to intellectually motivate and affectively relax the students. Ziv (1988) offers two examples of experiments with using humour in teaching and learning in higher education. The results of the first experiment, conducted on 161 students, showed significant differences between the two groups in favour of the group which learned with humour. The second experiment was conducted on 132 students in a one semester introductory psychology course and the results showed that the group studying with humor achieved higher scores on the final exam.

The results obtained show that the role of the teacher in modern-day teaching has changed and that it is now more important for the teacher to introduce students to contents in a creative, inspiring and innovative way, to see students as active participants

in the process of teaching and not as mere recipients of information, as well as that these are the key activities of teachers that inspire students to learn.

5. Conclusion

The importance and the role of the teacher in the educational process has been emphasized and valued throughout human history. The teacher was given certain characteristics, competencies, responsibilities and duties, and the modern society now assigns the teacher a new role and demands new knowledge and abilities from them (Đurić, 1996).

Teachers' characteristics which encourage students to become active and learn are: adequate organization of teaching, the way of interpreting contents, motivation for work and transferring of information, as well as finding ways to present the contents to each student in accordance with their abilities, skills and affinities and enable each student to solve the tasks. The teacher is not only a lecturer and an evaluator, but also a planner, an organizer, a moral trainer and, in addition to subject matter and methodical-didactic knowledge, they need to possess positive personal qualities (Nedeljković, 1997). Bratanić (1993) states that developed empathy skills can come into view in teacher-student communication. In order for a teacher to adjust their communication to their students, they need to communicate with them emphatically, i.e. adjust their communication to their students' abilities and levels of understanding.

Author Danilović (2011) states that the society today expects the teacher to possess about 200 positive moral virtues, to perform about 195 roles and functions, possess 50 forms and types of communication, possess knowledge from at least 10 scientific areas and disciplines, and be able to carry out 80 types and forms of learning, i.e. types of teaching, and that these are demands expected or asked from no other profession, even if they are maybe better appreciated and more highly respected in society.

Teachers in a higher education institution need to be both educators and associates, colleagues and mentors to their students. Similar results were obtained by authors Malčić, Tančić and Kostović (2017) in their research with third year students of the Faculty of Philosophy in Novi Sad. As an example of good practice, we can mention the Republic of Slovenia whose National program of higher education 2011-2020 lists excellence in teaching as one of the goals and demands the institutions to offer programs of continuous pedagogical training and support the teaching staff in developing their competencies. Another example is Great Britain where a College of Education, in cooperation with British universities, has developed "Framework of professional standards of United Kingdom for teaching and support for learning in higher education" which "nurtures creative and innovative approaches to teaching and learning" (Ćirić, 2018).

Krnjajić (2007) believes that the main goal of exploring the teacher's influence on students is to gain deeper understanding of teacher-student interaction. The teacher's

support, their perception of interpersonal connectedness, and favouring cooperative forms of learning are important factors which influence learning and prosocial outcomes. The results of several researches show that a high level of connectedness between high academic achievement, high educational expectations and class climate depends on the teacher's encouragement and support (Wang, Haertel, Walberg, 1990, in Krnjajić, 2007). The teacher's profession is very complex and demanding. A teacher needs to constantly develop in the pedagogical, psychological and professional sense, but also in the field of educational technologies and other general topics. This necessitates lifelong learning and continued professional development (Suzić, 2005) which further influence the teacher's motivation and encouragement offered to students.

Teachers need to accept that the students' demands change very quickly and that these changes ask for new competencies, new approaches to teaching and learning, and encourage open and flexible learning in order to achieve better learning outcomes. All of this leads to the teachers' lifelong education, their adjusting to modern generations and ways of working. The teaching process needs to be based of the latest scientific and professional knowledge, it should encourage critical thinking in students, and the teacher should be open to students' different opinions, i.e. the teacher should be an active participant of a two-way teaching process.

References

Ali, R., Mondal, M., Das, T. (2018). Pedagogy and the role of teachers in the teaching learning. *Journal of Emerging Technologies and Innovative Research (JETIR), 5*, 803–808.

Assunção Flores, M. (2023). Teacher education in times of crisis: enhancing or deprofessionalising the teaching profession?. *European Journal of Teacher Education*. DOI: 10.1080/02619768.2023.2210410

Bratanić, M. (1993) Mikropedagogija. Školska knjiga.

Carless, D. (2020). From teacher transmission of information to student feedback literacy: Activating the learner role in feedback processes. *Active Learning in Higher Education,*1–11.

Danilović, M. (2011). Nastavnik kao uzor, model, idol, ideal, simbol, vrednost, tj. mera, savršenog i svestrano obrazovanog čoveka. Uvodni referat, 6. međunarodni simpozijum *Tehnologija, Informatika i Obrazovanje za društvo učenja i znanja,* 3 -5. Jun 2011. Tehnički fakultet.

Đurić, Đ. (1997). *Socijalna psihologija obrazovanja*. Učiteljski fakultet u Somboru.

Garner, R. L. (2006). Humor in pedagogy: How ha-ha can lead to aha!. *College Teaching, 54*(1), 177-180.

Hadi, K., Dazrullisa, D., Susantini, E., Kuntjoro, S. (2020). The Effect of Teachers' Role in Learning on the Learning Outcomes of High School Students. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal), 3*, 4, 2774–2783.

Ivić, I., Pešikan, A. i Antić, S. (2001). *Aktivno učenje*. Institut za psihologiju.

Jagtap, P. (2016). Teacher's role as facilitator in learning. *Scholarly Research Journal's for humanity science & English language*, 3903–3905.

Joksimović, S. i Stojiljković, S. (2007). Students' values and their understanding of educational goals. In N. P. Terzis (Ed.). *Education and values in the Balkan countries*, (7) (pp. 161-168). Balkan Society for Pedagogy and Education.

Koludrović, M (2013). Mogućnosti razvijanja kompetencija učenja u suvremenoj nastavi *Pedagogijska istraživanja, 10* (2), 295–307.

Kovačević, M. (2011). Nastavničke kompetencije. *Vaspitanje i obrazovanje, Časopis za pedagošku teoriju i praksu, 4*, 143–155.

Krnjajić, S. (2006). Humor u razredu. U: S. Krnjajić (priredio), *Pretpostavke uspešne nastave* (str. 203–228). Institut za pedagoška istraživanja.

Krnjajić, S. (2007). *Pogled u razred*. Institut za pedagoška istraživanja.

Lalić-Vučetić, N. (2015). *Postupci nastavnika u razvijanju motivacije učenika za učenje*. Objavljena doktorska disertacija. Univerzitet u Beogradu – Filozofski fakultet.

Malčić, B., Tančić, N., Kostović, S. (2017). Dimenzije uloge nastavnika u visokoškolskoj nastavi iz perspektive studenata. Godišnjak Filozofskog fakulteta u Novom Sadu. 42/2017, str. 259-273

Nedeljković, M. (1997). Promene u društvu i obrazovanju i obrazovanje nastavnika. *Norma, časopis za teoriju i praksu vaspitanja i obrazovanja,* godina III , br. 1-2/97, 29–49.

Olsen, B. (2021.) Teacher quality around the world: what's currently happening and how can the present inform the future?. *European Journal of Teacher Education*, *44*, 3, 293-294.

Pravilnik o standardima kompetencija za profesiju nastavnika i njihovog profesionalnog razvoja (2011). Zavod za unapređivanje vaspitanja i obrazovanja. https://zuov.gov.rs/download/pravilnik-o-standardima-kompetencija-za-profesiju-nastavnika-i-njihovog-profesionalnog-razvoja/

Smith, K. (2021). Educating teachers for the future school - the challenge of bridging between perceptions of quality teaching and policy decisions: reflections from Norway. *European Journal of Teacher Education*, *44*, 3, 383–398.

Steadman, S. & Ellis, V. (2021). Teaching quality, social mobility and 'opportunity' in England: the case of the teaching and leadership innovation fund. *European Journal of Teacher Education*, *44*, 3, 399-414.

Stojiljković, S., Stojanović, A. i Dosković, Z. (2012). Empatičnost nastavnika. *Ličnost i obrazovno vaspitni rad, Tematski Zbornik radova Filozofskog fakulzeza u Nišu*, 29–46.

Suzić, N. (1998). *Kako motivisati učenike*. Zavod za udžbenike i nastavna sredstva.

Suzić, N. (2005). *Pedagogija XXI veka.* TT-centar.

Terhart, E. (2001). *Metode poučavanja i učenja.* Educa.

Trivunović, B. (2017). Komunikacione kompetencije univerzitetskih nastavnika. *Pedagoška stvarnost*, *63* (2), 120–131.

Trumić, R (2021). *Angažovanost učenika i nastavnika u nastavi i interpersonalni odnosi*.[doktorska disertacija Univerzitet u Banjoj Luci]. Filozofski fakultet.

Turk, M. i Ledić, J. (2016). *Kompetencije akademske profesije*. Filozofski fakultet u Rijeci.

Ćirić, M. (2018). Modernizacija nastave i učenja u Evropskom prostoru visokog obrazovanja u: Jačanje nastavničkih kompetencija DIDAKTIČKO-PEDAGOŠKE KOMPETENCIJE. Str. 5-30. Univerzitet u Nišu.

Vieluf, S., Gobel, K. (2019). Making intercultural learning in EFL lessons interesting - The role of teaching processes and individual learning prerequisites and their interactions. Teaching and Teacher Education, 79, 1–16.

Vranješević, J. (2005). Participacija učenika i autoritet nastavnika*. Inovacije u nastavi*. XVIII, 4, 83–91.

Vučinić, D. i Antonijević, R. (2020). Uloga nastavnika u ostvarivanju kvalitetnog obrazovnog procesa, *Teme*, XLIV, 3, 723–744.

Zbróg, P. (2014). Evaluation as a Source of Reflection for a Teacher Educator in the Process of Creating Methodological Projects. *TEACHER EDUCATORS and TEACHERS as LEARNERS*, 193-200.

Ziv, A. (1988). Teaching and learning with humor: Experiment and replication. *The Journal of Experimental Education*, *57*(1), 4-15.

/

Trust, belongingness, and teacher's self-efficacy: A quantitative investigation of an online intervention program for school teachers

Raul-Viorel Lupaș[•], Sabina Trif [••], Alina Simona Rusu [•••]

Abstract

Literature indicates that teachers and students who experience trust and belongingness in their school communities have higher levels of indicators of positive quality of life, such as performance, innovation, and creativity. Also, they are open to creating more authentic relationships and fostering an environment based on psychological safety with implications on their well-being, quality of life, self-efficacy, and their general mental health. This quantitative study aims to investigate the impact of an online training program called "Development of trust and belongingness in interpersonal relationships of school teachers" on several psychological variables related to the individual well-being. A number of 475 school teachers participated in the study, from several schools located in different regions of Romania. Data were collected pre- and post-intervention with an online form composed of three different questionnaires addressing the following variables: belongingness, connectedness and teacher's self-efficacy. The findings indicate significant effects of the online intervention program on all the target variables.

Keywords: school well-being; belongingness; teacher's self-efficacy; connectedness.

1. Introduction

Trust and belongingness are two psychological concepts that are often studied in relation to quality of life and occupational satisfaction, due to the positive impact they can have on the relational and emotional functioning of individuals, including those in the school settings, such as students and teachers. In the last decade, psychological trust has benefited from increased attention from specialists involved in economic functioning, team performance, as well as in the mental and socio-relational health (Edmonson, 2018; Dimitri, 2014; Moeller, 2020; Stebleton, 2014).

• PhD student, Doctoral School "Education, Reflection, Development", Faculty of Psychology and Sciences of Education, Babes-Bolyai University, Cluj-Napoca, Romania, raul.lupas@ubbcluj.ro
•• PhD, Department of Psychology, Faculty of Psychology and Sciences of Education, Babes-Bolyai University, Cluj-Napoca, Romania, sabinatrif@psychology.ro
••• PhD, Faculty of Animal Sciences and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, alina.rusu@usamvcluj.ro

The experience of trust at the level of interpersonal interactions in various contexts can produce many psycho-physiological and socio-professional benefits (Edmonson, 2018; Dimitri, 2014; Moeller, 2020; Stebleton, 2014; Thagard, 2018). Thus, organizations, schools, and teams in which individuals experience an increased level of trust register higher levels of performance, innovation, creativity, and openness to creating authentic relationships and an environment that promotes an increased sense of belongingness (Lee & Robins, 1995; Merchant, 2018; Edmonson, 2018; Stebleton, 2014; Moeller, 2020).

Trust is considered an essential prerequisite for the development and functioning of stable social relationships (Dimitri, 2014; *Lupas & Rusu, 2020; Lupas et al., 2021*), as well as a key factor in the functioning of organizations and societies (Dirks & Ferrin, 2002). Within organizations, trust has been associated with efficient functioning and with an increased need for the members of the organization to share a common goal and achieve it together (McEvily et al., 2003). The experience of interpersonal trust among the members of an organization can have positive effects on their attitude toward their workplace and their work-related behaviours, including their efficiency (Brower et al., 2009).

2. Theoretical background

Trust and belongingness in organizational contexts: Implications for schools

Several authors (Baumaister & Leary, 1995; Resnick et al., 1997, Roffey, 2012; Rowe, 2011) indicate that the efficacy of the educational process is profoundly influenced by the psycho-emotional needs, such as trust, connection, and belongingness. These needs are considered central to the relationships that are developed within the school communities. In complex and modern societies, it is important that the educational process for the next generation of students is placed in the responsibility of teachers who are motivated, have a high interest in the development of competencies necessary for adaptivity and resilience.

Educational literature emphasizes that both interpersonal trust and institutional trust can be affected by the school context and by its structural characteristics (Dimitri, 2014). For instance, Bryk & Schneider (2002) indicate that interpersonal trust between teachers is more fragile in schools with a high number of members. Other studies point out aspects connected to the understanding of the trust in school contexts and the need for integrating interindividual differences, such as socioeconomic status, ethnicity, gender etc. (Smith et al., 2001; Goddard et al., 2009).

A teacher's psychological profile should include commitment, responsibility, active involvement in the process, flexibility, and openness to change. Such characteristics are necessary considering that the good functionality of the school environment requires a constant exchange of trust and authentic connection between students and the adults involved in the process. Students should feel that they belong to the school environment, and for this, it is necessary that they perceive the adults around them caring about their

well-being. In fact, it is the experience of mistrust within relationships that predisposes to undesired attitudes and behaviours, such as bullying and absenteeism in schools. These kinds of attitudes and behaviours are counterproductive to the essential purpose, namely, to provide an environment conducive to growth, learning, and development for students (Tschannen-Moran & Hoy, 2000; Bryk & Schneider, 2002; Forsyth et al., 2006).

In regards to interpersonal functioning, belongingness represents an important construct that is indicated in the literature as one of the predictors of academic and psychosocial success (Slaten et al., 2016; Wadsworth et al., 2001, cited in Lupas & Rusu, 2020). High level of belongingness is associated with high levels of aspects of well-being, such as self-esteem, resilience and functional coping strategies in crisis situations (Rowe, 2011; Begen & Turner-Cobb, 2015; Slaten et al., 2016; Holt-Lunstad, Smith, & Layton, 2010; Lupas & Rusu, 2020).

In the context of school climate, belongingness is associated with interpersonal respect, acceptance and conflict management, this psychological concept being often related, both in teachers and in students, to high levels of attachment to school, engagement and motivation, as well as a sense of purpose in the community (Goodenow & Grady, 1993; Osterman, 2000; Willms, 2000; Hamm & Faircloth, 2005; Lupas & Rusu, 2020).

The concepts of attachment and security in relationships are important in defining belongingness, which is described as the pervasive human tendency to form a positive and secure attachment (Nathaniel et al., 2013). Often, to describe the sense of belongingness, the concept of connectedness is used. For example, those students who feel they belong to the school community have interpersonal relationships based on trust, they feel connected, understood and heard, have lower levels of social conflict, absenteeism, bullying, and higher levels of tolerance towards cultural diversity, as well as effective conflict coping skills (Baumaister & Leary, 1995; Kawachi & Berkmann, 2000; Libbey, 2004; Finn, 2012).

Belongingness in schools is a construct that includes behavioral and emotional psychological components, such as respect, acceptance, connectedness and inclusion (Arslan & Duru, 2017; Goodenow & Grady, 1993; Karcher & Lee, 2002). The concept contributes to several factors that promote student achievement, mental health and well-being (Haugen, Morris, & Wester, 2019). Although the implications of belongingness on teachers and students' school-related functionality and aspects of their well-being have started to be documented in the literature, there is still a need for planning and implementing of interventions and strategies that target the development of belongingness in the school communities.

The concept of *social connectedness* is often used to describe the feeling of belongingness. Connectedness refers to the meaningful relationships that an individual has within and outside the school (Libbey, 2004; Chuter, 2019), i.e. connections that include an increased level of trust, psychological safety and reciprocity. Connectedness, in the context of defining the sense of belongingness in schools, refers to a low level or

the absence of social conflict (such as bullying), tolerance to cultural diversity, and to a climate that promotes conflict prevention and foster the acquisition of new skills (Kawachi & Beckmann, 2000; Anderman, 2002; Chuter, 2019). Social connectedness is also defined as the level at which a person has and perceives a sufficient and diverse number of relationships, which allow the individual to provide and receive information, emotional and material support, and to create and develop a sense of belongingness (The Full Frame Initiative, 2013; Lupas & Rusu, 2020).

Teacher's self-efficacy in the context of school climate

The concept of self-efficacy, proposed and studied by Albert Bandura in the late 1970s and early 1980s, refers to an individual's set of beliefs about the ability to perform the necessary behaviors in order to achieve a certain performance or goal (Maddux & Kleinman, 2021). Self-efficacy reflects the confidence that an individual has in the personal ability to exercise control over one's motivations, behaviors, and social environment; the psychological concept has been applied and has had considerable influence in research, education, and clinical practice (Schunk & DiBenedetto, 202). In the field of health psychology, for example, the construct has been applied to develop treatment plans for disorders such as phobias, depression, addictions, pain control etc. (Maddux & Kleinman, 2021).

Schools in which teachers have high self-efficacy tend to be those where students are more engaged, have greater well-being and vitality, and have better academic results (Woolfolk, 2000). Skaalvik (2010) defines teacher self-efficacy as the set of beliefs that the teachers have regarding their abilities to plan, organize, and maintain activities that are necessary for students to achieve high school results. Some researchers believe that self-efficacy beliefs help determine the effort put into an activity, how much the individual will persevere when challenges arise, and how resilient they will be in the face of aversions and threatening or challenging situations (Pajares, 1996). Bandura (1989) notes that the teacher's beliefs related to self-efficacy make a difference regarding the student's ability to learn and move forward and succeed, even when faced with difficult moments, or lack of motivation (cited in Moran, 2001).

In the last decades, research has highlighted associations between teacher self-efficacy and self-confidence, motivation, resilience, as well as the quality of classroom practices (Bjorjlund, 2020; Bandura, 1997; Kleinsasser, 2014). Other researches highlighted the associations between the concept and better social relationships, a sense of belongingness, and integration, especially for teachers that are at the beginning of their careers (Bjorjlund, 2020; Barnett et al., 2017; Thomas et al., 2019).

Teacher self-efficacy can have a profound effect on the educational process, and on the overall motivation, commitment, and resilience of the school members (Day, 2008; Flores, 2006; Gu & Day, 2007). Teachers who have high self-efficacy tend to consider that all students have the potential to learn and be taught, and consequently invest more time in the educational process. What was observed in studies is that teachers with higher self-

efficacy (Dunn & Rakes, 2011; Zee & Koomen, 2016) put more effort into handling difficult relationships with students, and not avoiding them.

The main objective of this paper is the examination of the variables trust, belongingness and teacher's self-efficacy, through the lens of a quantitative analysis regarding the effects of an online group intervention program called *Development of trust and belonging in interpersonal relationships of school teachers (DTBIR).* The program aims to shape and enrich the work and learning experience of the participants (school teachers in Romania), by promoting interpersonal relationships based on prioritizing the feeling of trust, belongingness, and well-being.

3. Methodology

Objectives and hypotheses

The general objective of the study is to investigate at quantitative level an online well-being group intervention, i.e. *Development of trust and belongingness in interpersonal relationships of school teachers*. Following the analysis of the literature presented above, the specific objectives of this paper are: (1) To test the effectiveness of the group psychological intervention program in terms of increasing general belongingness and psychological trust, by analyzing the following three variables: general belongingness, teacher's self-efficacy and social connectedness; (2) To investigate the relationship between teacher's self-efficacy and the evolution of the feeling of belongingness (pre- and post-intervention).

According to the stated objectives, the following hypotheses will be tested: 1. After the implementation of the online well-being program, the participants will report higher values of the variable belongingness; 2. After the implementation of the online well-being program, the participants will report higher values of the variable teacher`s self-efficacy; 3. After the implementation of the online well-being program, the participants will report higher values of the variable social connectedness; 4. An increased score on the teacher self-efficacy scale will be associated with higher values of the pre-test and post-test differences of the variable belongingness.

Participants

In the pre-intervention phase, 475 participants from Romania were included in this study. The main inclusion criteria were to be a teacher in a school that is part of the educational project "*The School of Trust*". "The School of Trust" is a comprehensive project that aims to improve the quality of the relationships within the schools and to increase the level of general well-being among teachers and other members of the school communities. It is important to mention that the DBTIR program was part of the section Well-being of the "School of Trust", which was delivered by a team of experts from Babes-Bolyai University, Mind Education Company and the Well-being Institute, Cluj-Napoca,

Romania. The structure of the program was piloted in 2019 on a number of 25 teachers from Transylvania College, Cluj-Napoca, Romania (Lupas & Rusu, 2020). This pilot phase served as an important base for the development of the DBTIR program, which was offered to a larger number of teachers from various schools in Romania. The delivery of the program was done online, due to the COVID-19 conditions. The participants came from different counties in Romania: Bucharest, Braşov, Cluj, Baia Mare, Alba Iulia, Oradea, and Iaşi. Almost all respondents (84.2%) were women, while only 15.8% were men. Regarding their level of education, 56,7% of respondents had bachelor's degree studies, 38% post-university studies, 4,3% were graduates of high schools and the rest of the teachers had other types of studies.

Instruments

Social Connectedness Scale (SCS; Lee & Robbins, 1995)

The scale is composed of items from all three categories of belongingness proposed by the Lee and Robbins (1995): connectedness (4 items), affiliation (3 items), and companionship/ fellowship (1 item). The items portray a general emotional distancing between oneself and others, that can be experienced among friends or close colleagues, as shown by the item "*Even among my friends, there is no sense of brotherhood / sisterhood*". High scores reflect an increased sense of connectedness and social belongingness. As indicated by the authors (Lee & Robinson, 1995), the value of the Alpha Cronbach's coefficient for the Social Connectedness Scale is .91.

The General Belongingness Scale (GBS; Malone, Pillow, & Osman, 2011)

To develop the General Belonging Scale (Malone et al., 2011), three studies were conducted, which resulted in an instrument with 12 items. The construction of the items was carried out by examining the specialized literature, following keywords, themes, and tools related to belongingness. Initially, 30 items were generated, 14 with positive valence and 16 with negative valence. The 12 items selected for the final version of the scale (6 with positive valence; 6 with negative valence) were allocated to the two categories of factors (Acceptance/Inclusion and Rejection/Exclusion). Negatively formulated items were reverse scored and the final scale is used as a single instrument. The scale has good psychometric properties. Alpha Cronbach's coefficient for the scale is .95 with an average inter-item correlation (AIC) = .62 (M = 69.4, SD = 13.5; Satici & Tekin, 2016).

Teachers' Sense of Efficacy Scale, the short form (Tschannen-Moran & Woolfolk Hoy, 2001)

The Teachers' Sense of Self-Efficacy Scale is an evaluation tool designed to gain a better understanding of the aspects that create difficulties for teachers in their teaching process and activities at school. The two forms, the long one containing 24 items and the short

one containing 12 items (the one used in the present paper), include three subscales of teacher self-efficacy: *Self-efficacy in student engagement* (items 2, 4, 7, 11), *Self-efficacy in training practices* (items 5, 9, 10, 12), *Self-efficacy in classroom management* (items 1, 3, 6, 8). In the study carried out by Tschannen-Moran and Woolfolk Hoy (2001), the scale showed a value of the Alpha Cronbach coefficient of .94.

Procedure

In the first phase of program's implementation, participants received an email from the Well-being Institute's Administrative Department informing them about the online program and its objectives. Also, the participants received another email with the invitation to complete an online Google survey, which contained the three scales used in the present study. The responses were collected from October 2020 to February 2021. The full completion of the questionnaire took about 30 minutes. The participants had the option to quit the process of data collection at any moment. In the document created online, the participants were informed about the purpose of the research, the conditions for completing it, and the granting of consent to participate in the online testing. They were also informed about the fact that participation was voluntary and that all the data were confidential. The questionnaires included in the survey were translated into Romanian language and checked by two experts in psychology and sciences of education.

Participation in the DTBIR program involved 5 online group sessions of one hour and 30 minutes each, held online through the ZOOM platform. The frequency of the meetings was weekly. Before attending these meetings, participants were advised to complete the online course: *Trust. The foundation of authentic relationships*, for which they were given free access on the platform www.sinergie.ro. The purpose of completing this course was to familiarise the participants with important concepts used in the DTBIR program. This helped them prepare for the live online group sessions. The online course had a duration of 120 minutes and was composed of 8 modules. In the first online session, important topics were discussed.

The 5 online sessions aimed at developing the following psycho-social skills that can function as protective factors in terms of mental health and social functioning of the participants, i.e. school teachers: psychological resilience, emotional agility, emotional self-regulation, active and empathetic listening, communication in conflictual situations, understanding the human personality, from the perspective of temperament, values, and cognitive schemes; using techniques and practices from positive psychology, such as mindfulness, appreciation, positive feedback, gratitude.

All of these competencies mentioned above can have an important beneficial impact on the quality of the relationships within schools. Also, after completing the program, some of the participants had the opportunity to participate in a qualitative focus group study, from which future data will be extracted, regarding the perception of the DTBIR program and the impact at a subjective level.

Design

An cvasi-experimental design with repeated measurements (pre- and post-test evaluations) was used in this study. The three dependent variables that were evaluated are general belongingness, social connectedness, and teacher's self-efficacy. The independent variable was the DTBIR program, with two phases of data collection (pre- and post-intervention). Conducting an experimental study is motivated mainly by the possibility of establishing causal relationships. Unlike a correlational design, which involves simply observing a phenomenon in the absence of any intervention, in the experimental design the independent variable is manipulated (Field & Hole, 2002). More specifically, the proposed experimental design is one with repeated measures, in which all participants go through all the experimental conditions (Field & Hole, 2002).

4.Results

In order to test the proposed hypotheses, we used SPSS version 26. The first three hypotheses were tested with paired samples t-tests, while the last hypothesis was tested with linear regression. Table 1 presents the descriptive statistics (means, standard deviations, correlations).

Table 1. *Descriptive statistics*

Variable	Mean (SD)	1	2	3	4	5	6	7
Belongingness Pretest	4.39 (0.46)	1						
Belongingness Posttest	4.46 (0.46)	.74**	1					
Self-Efficacy Pretest	4.44 (0.51)	.38**	.37**	1				
Self-Efficacy Posttest	4.53 (0.46)	.33**	.39**	.74**	1			
Connectedness Pretest	4.35 (0.54)	.82**	.65**	.38**	.28**	1		
Connectedness Posttest	4.41 (0.54)	.68**	.83**	.32**	.34**	.66**	1	
Belongingness Difference Pretest – Posttest	-.07 (0.33)	.36**	- .36*	.03	-.08	.23**	-.21**	1

** $p \leq 0.01$

We further tested whether the intervention led to differences in belongingness (h1), self-efficacy (h2), and connectedness (h3). Results show that there is a significant difference ($t(299) = -3.815$, $p < .001$) between the pretest level of belongingness ($M = 4.389$, $SD = 0.463$) and the posttest level of belongingness ($M = 4.463$, $SD = 0.463$). Thus, our results support the first hypothesis, showing an increase in the level of belongingness after the intervention. The visual representation of the relationship can be observed in Figure 1.

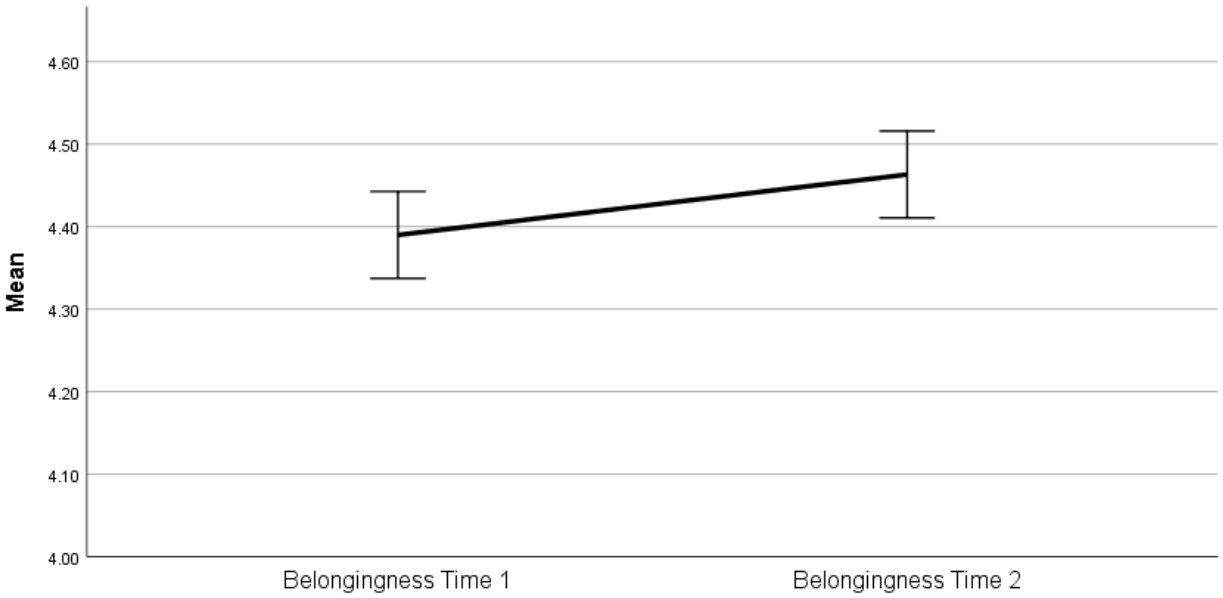


Figure 1. *Differences in Belongingness from Time 1 to Time 2*

Results also show significant differences ($t(299) = -4.42$, $p < .001$) between the pretest level of self-efficacy ($M = 4.44$, $SD = 0.51$) and the posttest level of self-efficacy ($M = 4.53$, $SD = 0.46$). Thus, data shows an increase in the level of self-efficacy after the intervention, offering empirical support for the second hypothesis. The visual representation of the relationship can be observed in Figure 2.

Regarding the differences in connectedness, results show a significant difference ($t(299) = -2.26$, $p = .025$) between the pretest level of connectedness ($M = 4.35$, $SD = 0.54$) and the posttest level of self-efficacy ($M = 4.41$, $SD = 0.54$). Thus, hypothesis 3 is empirically supported, with an increase in the level of connectedness after the intervention. The visual representation of the relationship can be observed in Figure 3.

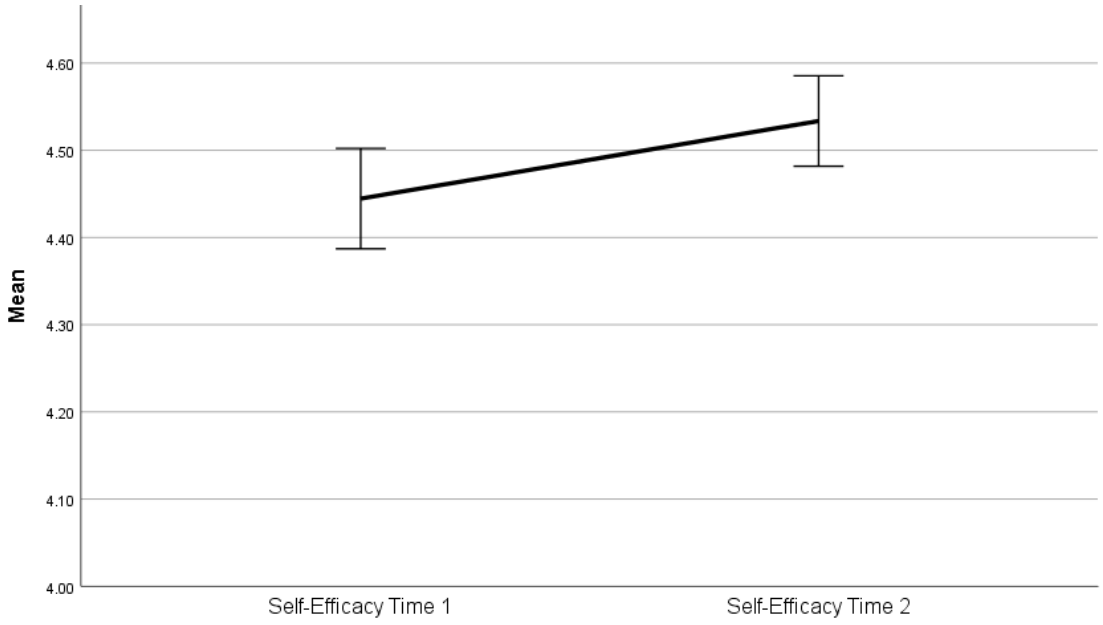


Figure 2. *Differences in Self-Efficacy from Time 1 to Time 2*

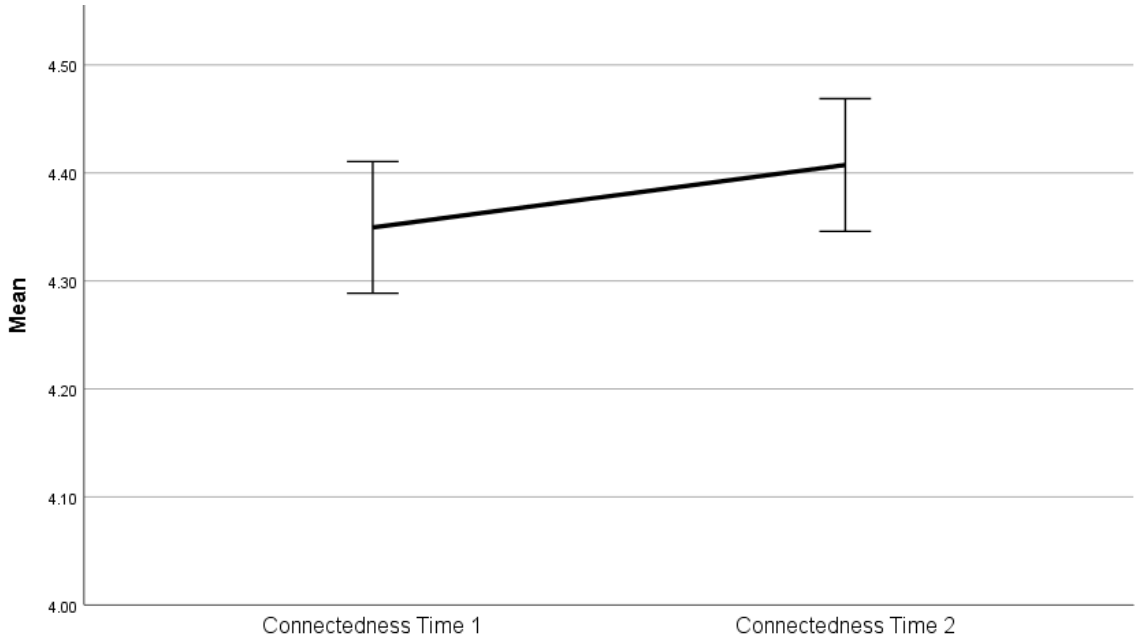


Figure 3. *Differences in Connectedness from Time 1 to Time 2*

The fourth hypothesis proposes that pretest levels of self-efficacy influence the difference in belongingness from the pretest to the post-test. We tested this hypothesis with linear regression analysis, with experience as a controlled variable. The model is not significant ($F(2,297) = 0.11$, $p = .895$) and explains 0.1% of the variance of belongingness differences.

5.Discussion

The aim of this study was to analyze at a quantitative level the impact of an online intervention program with a strong psycho-educational component, designed to address psychological concepts associated to the well-being of schoolteachers. A series of hypotheses were constructed to test the impact of the program on the following variables: *belongingness, self-efficacy* and *social connectedness*, which are all documented in the literature as having protective values in terms of mental health. A specific objective of the study was to include a psycho-educational component in the program, i.e. materials and information from the literature regarding the key concepts, in order to promote among the participating pre-university teachers attitudes, behaviours and beliefs associated with well-being. The longitudinal aim of the intervention program is to facilitate the development of a school environment defined by safety and trust, where school members can experience more inclusion, acceptance and can identify the necessary tools so that students can have good academic results and social-emotional functioning.

The first hypothesis of this study was that, after completing the program, higher values of the belongingness variable would be recorded. The data indicated that the difference between the pre-test and post-test measurements for the belongingness

variable was statistically significant. The second hypothesis assumed that higher values of the self-efficacy variable will be recorded after completing the program. The data presented in this paper indicates that the difference between pre-test and post-test measurements for the self-efficacy variable was statistically significant. Thus, the second hypothesis was also confirmed. The third hypothesis assumed that after completing the program, higher values of the social connectedness variable will be recorded. The findings show that the third hypothesis was confirmed. Thus, the results support the fact that the program was effective in increasing the values of all the target variables.

The last hypothesis of the study, which assumed that higher levels of self-efficacy pre-intervention will influence the difference in belongingness from the pre-test to the post-test was not statistically significant. Therefor, as a future direction of research, we intend to investigate in depth the associations between self-efficacy and belongingness within school communities, by combining the quantitative analysis with a qualitative approach.

Some limitations were identified for this study. In terms of preconditions for the online intervention program, the participants were supposed to complete an online course entitled *Trust. The basis for authentic relationships*, on the www.sinergie.ro platform. Although the participants were asked in the first meeting if they completed the course or not, no in-depth verification was carried out. For future interventions like this, a short questionnaire can be constructed to check whether all the participants did meet the preconditions for being included in the intervention program.

Another limitation of the study is related to the inter-personal differences of the participants. Some of them were teachers in schools from rural areas, and some from the urban area. Some were part of more prestigious schools, and some came for schools that were disadvantaged from a social and economic point of view. Although these aspects were in our attention from the beginning and we adapted as much as possible the intervention according to these factors, future interventions might benefit from a more systematic attention on the differences between the groups and their impact on the outcomes.

6. Conclusions

The program presented in this study had the objective of creating psycho-educational contexts in which teachers from different schools connect and interact with each other, while developing skills related to communication, professional self-efficacy, better stress management, dealing with uncomfortable situations, making more optimal decisions that include personal well-being, but also caring for others. The results of the analysed variables are promising and they are encouraging us for future interventions of this kind.

Considering the importance of belongingness and trust in educational settings, it is essential for teachers, who serve as relational and emotional role models to their students, to understand the need to incorporate key aspects of these psychological dimension in designing interventions addressing their well-being. By understanding and

effectively applying the key aspects of belongingness and trust, teachers and other members of school communities, can exert a positive impact on their own individual functioning, as well as on students' individual growth and educational evolution, thereby strengthening their social and emotional functioning in a meaningful and sustainable manner.

References

Adler, P. S., & Know, S. W. (2002). Social Capital: Prospects for A New Concept. *The Academy of Management Review,* 27, 17-40.

Anderman, E. M. (2002). School effects on psychological outcomes during adolescence. *Journal of Educational Psychology, 94(4),* 795.

Arslan, Gökmen. (2019). School belonging in adolescents: Exploring the associations with school achievement and internalising and externalising problems. *Educational and Child Psychology*. 36. 22-33.

Bandura, A. (1989). Human Agency in Social Cognitive Theory. The American Psychologist, 44, 1175-1184. https://doi.org/10.1037/0003-066X.44.9.1175

Bandura, A. (1997). *Self-efficacy: The exercise of control.* W H Freeman/Times Books/ Henry Holt & Co.

Barnatt, J., Gahlsdorf Terrell, D., D'Souza, L. A., Jong, C., Cochran-Smith, M., Viesca, K. M., Gleeson, A. M., McQuillan, P., & Shakman, K. (2017). Interpreting early career trajectories. *Educational Policy*, *31*(7), 992–1032. https://doi. org/10.1177/0895904815625286

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497–529. https://doi.org/10.1037/0033-2909.117.3.497

Begen, F. M., & Turner-Cobb, J. (2015). Benefits of belonging: Experimental manipulation of social inclusion to enhance psychological and physiological health parameters, *Psychology & Health*, 30, 568-582.

Bjorklund, P., Daly, A. J., Ambrose, R., & van Es, E. A. (2020). Connections and Capacity: An Exploration of Preservice Teachers' Sense of Belonging, Social Networks, and Self-Efficacy in Three Teacher Education Programs. AERA Open, 6(1). https://doi.org/10.1177/2332858420901496

Blum, Robert & Libbey, H.P.. (2004). School connectedness: Strengthening health and education outcomes for teenagers. Journal of School Health. 74. 229-299.

Brower, H. H., Lester, S. W., Korsgaard, M. A., & Dineen, B. R. (2009). A closer look at trust between managers and subordinates: Understanding the effects of both trusting and being trusted on subordinate outcomes. *Journal of Management, 35*(2), 327–347. https://doi.org/10.1177/0149206307312511

Bryk, A. S., & Schneider, B. (2002). Trust in schools. A core resource for improvement. *New York: Russell Sage Foundation*.

Chuter, V., West, M., Hawke, F. *et al.* Where do we stand? The availability and efficacy of diabetes related foot health programs for Aboriginal and Torres Strait Islander Australians: a systematic review. *J Foot Ankle Res* **12**, 17 (2019). https://doi.org/10.1186/s13047-019-0326-1

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin, 127*(1), 87–127. https://doi.org/10.1037/0033-2909.127.1.87

David, S. (2016). Emotional Agility: Get Unstuck, Embrace Change, and Thrive in Work and Life. London: *Penguin Life*.

Day, C. (2008). Committed for life? Variations in teachers' work, lives and effectiveness. *Journal of Educational Change*, *9*, 243–260. https://doi.org/10.1007/s10833-007-9054-6

Dimitri V. M., & Forsyth, M. (2014). Trust and School life: The role of Trust for Learning, Teaching, Leading, and Bridging. *Springer Science + Business Media*. DOI:10.1007/978-94-017-8014-8

Dirks, K. T., & Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology, 87*(4), 611–628. https://doi.org/10.1037/0021-9010.87.4.611

Edmondson, A. C. (2018). *The fearless organization*. John Wiley & Sons.

Finn, Jeremy & Zimmer, Kayla. (2012). Student Engagement: What Is It? Why Does It Matter? 10.1007/978-1-4614-2018-7_5.

Field, Andy & Hole, Graham. (2003). How to Design and Report Experiments.

Flores, M. A. (2006). Being a novice teacher in two different settings: Struggles, continuities, and discontinuities. *Teachers College Record*, *108*(10), 2021–2052. https://doi.org/10.1111/j.1467-9620.2006.00773.x

Forsyth, D. R. (2006). Conflict. In D. R. Forsyth (Ed.), *Group Dynamics* (5th ed., pp. 388-389)

Forsyth, P. B., Adams, C. M., & Hoy, W. K. (2011). *Collective trust: Why schools can't improve without it*. New York: Teacher College Press.

Goddard R., Salloum J. S., & Bereditsky, D. (2009). Trust as a Mediator of the Relationships Between Poverty, Racial Composition, and Academic Achievement Evidence From Michigan's Public Elementary Schools. *Educational Administration Quarterly*, 45(2), 292-311.

Goddard, R. D., Hoy, W. K., & Woolfolk, A. (2000). Collective Teacher Efficacy: Its Meaning, Measure, and Effect on Student Achievement. American Education Research Journal, 37, 479-507. https://doi.org/10.3102/00028312037002479

Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education, 62*(1), 60 71. https://doi.org/10.1080/00220973.1993.9943831

Hamm, J.V., & Faircloth, B.S. (2005). The role of friendship in adolescents' sense of school belonging. *New Directions for Child and Adolescent Development*, *2005*(107), 61–78. doi:10.1002/cd.121

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and Social Isolation as Risk Factors for Mortality. *Perspectives on Psychological Science*. https://doi.org/10.1177/1745691614568352

Jetten, J., Haslam, C., Haslam, S.A., & Branscombe, N. (2009). The social cure. *Scientific American Mind*, *20*, 26–33.

Kawachi, Ichiro & Berkman, Lisa. (2014). Social Capital, Social Cohesion, and Health. Social Epidemiology. 290-319. 10.1093/med/9780195377903.003.0008.

Karcher, M.J., Lee, Y. Connectedness among taiwanese middle school students: a validation study of the hemingway measure of adolescent connectedness. *Asia Pacific Educ. Rev.* **3**, 92–114 (2002). https://doi.org/10.1007/BF03024924han

Kleinsasser, R. (2014). Teacher efficacy in Teaching and Teacher Education. *Teaching and Teacher Education*, *44*, 168-179. https://doi.org/10.1016/j.tate.2014.07.007

Lee, R.M., & Robbins, S.B. (1995). Measuring belongingness: The social connectedness and the social assurance scales. *Journal of Counseling Psychology*, *42*(2), 232-241.

Fukuyama, F. (1995). *Trust: The social virtues and the creation of prosperity*. New York: Free Press.

Lupaș, R., & Rusu, A. S. (2020). Belongingness and maladaptive schemas: A wellbeing group intervention program for high-school teachers. *Educatia 21 Journal, 19, 25-31.* doi: 10.24193/ed21.2020.19.03

Lupas, R. V., Petrovai, D. S., Mercea, R., & Rusu, A. S. (2022). Theoretical Bases Of A Wellbeing Intervention Program For Pre-University Teachers. *In I. Albulescu, & C. Stan (Eds.), Education, Reflection, Development - ERD 2021, vol 2. European Proceedings of Educational Sciences* (pp. 785-794). European Publisher.

doi: 10.15405/epes.22032.78

Maddux, J. E., & Kleiman, E. M. (2021). Self-efficacy: The power of believing you can. In C. R. Snyder, S. J. Lopez, L. M. Edwards, & S. C. Marques (Eds.), *The Oxford handbook of positive psychology* (pp. 443–452). Oxford University Press.

Malone, G.P. (2011). The General Belongingness Scale (GBS): An Assessment of Achieved Belongingness and an Examination of Its Predictive Unity. University of Texas at San Antonio.

McEvily, B., Perrone, V., & Zaheer, A. (2003). Trust as an organizing principle. Org. Sci., 14, 91–103. doi: 10.1287/orsc.14.1.91.12814

Merchant, Kenneth & Stede, W.A. (2011). Management Control Systems: Performance Measurement, Evaluation and Incentives.

Moeller, R. W., Seehuus, M., & Peisch, V. (2020). Emotional Intelligence, Belongingness, and Mental Health in College Students. *Frontiers in Psychology*, 11. 93. 10.3389/fpsyg.2020.00093.

Muijs D., & Sampson K., (2021). The trust in testing times: the role of multi-academy trusts during the pandemic. *MATs, multi academy trust.*

Nathaniel M Lambert, Tyler F Stillman, Joshua A Hicks, Shanmukh Kamble, Roy F Baumeister, Frank D Fincham. (2013). To Belong Is to Matter: Sense of Belonging Enhances Meaning in Life. Nov;39(11):1418-27. doi: 10.1177/0146167213499186

Osterman, K.F. (2000). Students' need for belonging in the school community. *Review of Educational Research*, *70*, 323–367. doi:10.3102/00346543070003323

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543–578. https://doi.org/10.2307/1170653

Dunn, K. E., & Rakes, G. C. (2011). Teaching teachers: An investigation of beliefs in teacher education students. *Learning Environments Research*, *14*(1), 39–58. https://doi.org/10.1007/s10984-011-9083-1

Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., Tabor, J., Beuhring, T., Sieving, R. E., Shew, M., Ireland, M., Bearinger, L. H., & Udry, J. R. (1997). Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *JAMA: Journal of the American Medical Association, 278*(10), 823–832. https://doi.org/10.1001/jama.278.10.823

Roffey, Sue. (2012). Pupil wellbeing -Teacher wellbeing: Two sides of the same coin?. Educational and Child Psychology. 29. 8-17. 10.53841/bpsecp.2012.29.4.8.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998) Not So Different after All: A Cross-Discipline View of Trust. *Academy of Management Review*, *23*, 393-404. http://dx.doi.org/10.5465/AMR.1998.926617

Rowe, F. & Donald, S. (2011). "Promoting connectedness through whole-school approaches", *Health Education*, Vol. 111 Iss 1 pp. 49 – 65. doi.org/10.1108/09654281111094973

Shamir, B., & Lapidot, Y. (2003). Trust in Organizational Superiors: Systemic and Collective Considerations. *Organization Studies, 24*(3), 463–491.
https://doi.org/10.1177/0170840603024003912

Schunk, D. H., & DiBenedetto, M. K. (2021). Self-efficacy and human motivation. In A. J. Elliot (Ed.), *Advances in motivation science* (pp. 153–179). Elsevier Academic Press. https://doi.org/10.1016/bs.adms.2020.10.001

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher Self-Efficacy And Teacher Burnout: A Study of Relations. Teaching and Teacher Education, 26, 1059-1069.
http://dx.doi.org/10.1016/j.tate.2009.11.001

Smith, M.K. (2001) The Learning Organization. The Encyclopedia of Informal Education. Vol 4, no. 3. / http://www.infed.org/biblio/learning-organization.htm

Smits M., Hulstijn J. (2020). Blockchain Applications and Institutional Trust. Frontiers in Blockchain 3. DOI: 10.3389/fbloc.2020.00005

Slaten, C. D., Ferguson, J. K., Allen, K.-A., Brodrick, D.-V., & Waters, L. (2016). School belonging: A review of the history, current trends, and future directions. *The Educational and Developmental Psychologist, 33*(1), 1–15.
https://doi.org/10.1017/edp.2016.6

Stebleton, M. J., Soria, K. M., and Huesman, R. L. Jr. (2014). First–generation students' sense of belonging, mental health, and use of counseling services at public research universities. *Journal of College Counseling, 17*, 6–20.
doi: 10.1002/j.2161-1882.2014.00044.x

Stickl Haugen, J., Wachter Morris, C., & Wester, K. (2019). The need to belong: An exploration of belonging among urban middle school students. *Journal of Child and Adolescent Counseling, 5*(1), 1–17. https://doi.org/10.1080/23727810.2018.1556988

Stonen, D., Patton, B., & Heen, S. (1999). Difficult conversations: how to discuss what matters most. New York, N.Y.: Viking.

Tarter, C. J., & Hoy, W. K. (1988). The context of trust: Teachers and the principal. *The High School Journal, 72*(1), 17–24.

Tschannen-Moran, M., & Woolfolk Hoy A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783–805.
https://doi.org/10.1016/S0742-051X(01)00036-1

Thagard, P., (2018). What is trust? *Psychology Today.*

Zee, M., & Koomen, H. M. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational Research*, *86*(4), 981–1015. https://doi.org/10.3102/0034654315626801

Exploring Virtual Reflective Learning Experiences in Higher Education

Anca Luștrea[•], Melinda Dincă[••], Mariana Crașovan[•••], Atalia Onițiu[••••], Dan Lucheș[•••••], Håkon Fyhn[••••••], Jens Røyrvik[••••••••]

Abstract

As a result of the COVID-19 pandemic, formal education underwent a period of rapid transformation. Beyond this period, the virtual learning environment proposed a reevaluation of curriculum design and didactic strategies. The Classroom Laboratory NTNU-WUT Joint Course (CL) was introduced as a novel learning experience for students at West University of Timisoara (WUT) and the Norwegian University of Science and Technology (NTNU). This experimental course was proposed as part of the Romania-Norway collaboration and incorporates Virtual Project Based Learning (VPBL) in cross-cultural and cross-disciplinary online learning groups. This study aims to describe the learning experiences of Romanian students enrolled at WUT in the CL course during the 2021–2022 academic year. In a quasi-experimental design, 24 Romanian students participated in a seven-week transversal CL course, collaborating with Norwegian peers to develop a solution for a social problem. ••Students made significant gains in all three dimensions targeted by VPBL: skill development, self-regulation of learning, and group interactions in the online environment. In addition, the learning of students was compared based on the field of science they are pursuing (STEM and non-STEM). The results indicate that students enrolled in STEM disciplines demonstrated greater benefits from this instructional approach, as evident in their progress across the three dimensions of PBL. The qualitative analysis of the students' journals reveals a positive learning experience in terms of knowledge acquisition, skill development, and affective engagement. In conclusion, CL and VBPL are valid strategies for online university-level instruction.

Keywords: Virtual Classrooms, Virtual Project-Based Learning, online learning, cross-cultural learning.

• Associate Professor, Department of Educational Sciences, University Clinic of Therapies and Psycho-Pedagogical Counseling, West University of Timisoara, Romania. anca.lustrea@e-uvt.ro

•• Associate Professor, Department of Sociology, West University of Timisoara, Romania. melinda.dinca@e-uvt.ro

••• **Corresponding author**. Associate Professor, Department of Educational Sciences, University Clinic of Therapies and Psycho-Pedagogical Counseling, West University of Timisoara, Romania. mariana.crasovan@e-uvt.ro

•••• Lecturer, Department of Sociology, West University of Timisoara, Romania. atalia.onitiu@e-uvt.ro

••••• Associate Professor, Department of Sociology, West University of Timisoara, Romania. daniel.luches@e-uvt.ro

•••••• Associate Professor, Department of Social Anthropology, Norwegian University of Science and Technology, Norway. hakon.fyhn@ntnu.no

•••••• Associate Professor, Department of Social Anthropology, Norwegian University of Science and Technology, Norway. jens.royrvik@ntnu.no

1. Introduction

The online environment has revolutionized education, offering a wide range of possibilities and unique interactions (Ferri et al., 2020). Online learning has long been recognized for its numerous benefits, leading to the implementation of various online teaching options such as distance learning, remote learning, and Massive Open Online Courses (MOOCs) nearly two decades ago (Bates, 2005). The COVID-19 pandemic played a significant role in bringing online learning to the forefront, as it became the primary mode of education worldwide (Dhawan, 2020). As we move beyond the pandemic, we find ourselves in a world that is significantly more digitized, with educators and students alike demonstrating enhanced competency (Myyry et al., 2022) and willingness to utilize internet-based resources (Clary et al., 2022), advanced digital tools, and an accessible global learning landscape (Robson et al., 2022). While online teaching and learning have been extensively studied (Ulum, 2021), there remains a need for rigorous scientific validation to further substantiate their effectiveness. This article contributes to this growing body of research, aiming to provide additional scientific evidence that underscores the validity of the Classroom Laboratory (CL) course concept and the Virtual Project-Based Learning (VPBL) online teaching method.

Higher education institutions (HEIs) have been compelled to reevaluate their entire teaching process, adapting to the challenges of online learning with varying degrees of success (Zhang et al., 2022). As we navigate the post-pandemic stage, it is imperative to identify and sustain best practice models that align with the fundamental mission of HEIs: to educate future professionals to be competent in their field of study but also possess transversal skills, enabling them to effectively utilize new digital technologies and critically reflect on their professional performance (García-Álvarez et al., 2022). The CL course aligns with these objectives as it offers students an active, online learning experience that can be designed both cross-cultural and cross-disciplinary (Dincă et al., 2021). The course's primary aim is to foster the development of transversal skills by engaging students in the exploration of social problems and establishing a continual connection with the labor market (Dincă et al., 2023a). By embracing CL, HEIs can provide students with a dynamic educational framework that prepares them for the demands of a rapidly evolving professional landscape (Berge, 2020).

The CL is an instructional approach that integrates teaching, learning, and research, with all methodological decisions based on rigorous scientific evidence. The CL, as a pedagogical framework, inherently serves as a space for experimentation, simulation of real-world situations, and the application of scientific methods that have contributed to the advancement of knowledge (Craşovan et al., 2022). In the realm of social sciences, CL relies on Project-Based Learning (PBL) as a teaching and learning approach. In the context of this study, CL is realized through online Virtual PBL (VPBL).

The primary objective of CL is to cultivate transversal skills among students, equipping them with the necessary competencies to thrive in a competitive labor market and ensuring their resilience in both career and personal development (Dincă et al.,

2023b). By engaging in CL, students are provided with opportunities to develop critical skills that extend beyond the boundaries of their specific disciplines. These transversal skills encompass areas such as effective communication, teamwork, critical thinking, problem-solving, and reflectivity. In our study, the CL was implemented in a cross-cultural context, with the aim of cultivating transversal skills that encompass cultural understanding, English literacy, and digital skills.

PBL is a highly effective educational approach grounded in constructivist theories, emphasizing active student engagement in real-world problem-solving (Susilowibowo & Tantri Hardini, 2019). By working collaboratively in groups, students apply their knowledge and skills to address authentic problems, cultivating higher-order thinking skills such as critical thinking and decision-making (Wang, 2022). With the integration of virtual technologies, VPBL has emerged, leveraging digital tools to create virtual environments (Mantra et al., 2022), possible to apply for cross-cultural and cross-disciplinary collaboration.

VPBL offers an ideal platform for developing transversal skills (Arwatchananukul et al., 2022). Transversal skills, including communication, teamwork, critical thinking, and cultural understanding, are crucial in today's interconnected world. By engaging in VPBL within CL, students gain global perspectives, enhance their cultural understanding, and refine their communication skills. These skills are transferable and essential for personal and professional success.

The purpose of this study is to describe the learning experiences of Romanian students enrolled in a cross-cultural, cross-disciplinary course, CL, applying the VPBL method. To measure the learning outcomes in relation to transferable skills, as proposed by Dincă et al. (2022), the assessment encompassed three dimensions, in total a set of 14 skills. The first dimension assessed in this study is online self-regulation, which pertains to the capacity of learners to effectively manage and regulate their learning within the online environment (Broadbent et al., 2022). Online self-regulation involves several key components that enable learners to optimize their learning experiences. These components include the ability to establish meaningful and attainable learning goals, exert control over the online environment to ensure access to necessary learning resources, employ strategies that are most effective for individual learning styles, seek assistance and support when required, engage in self-evaluation and reflection, and make adjustments based on these assessments. The second dimension examined in this study is competence development, specifically focusing on competencies within the cognitive domain. This dimension encompasses various key competencies that are crucial for learners to develop in order to enhance their cognitive abilities and problem-solving skills within an online learning environment. The competencies measured within the cognitive domain include creativity, complex problem-solving, meta-cognitive awareness, collaboration, and communication. These competencies collectively contribute to learners' overall cognitive development and their ability to effectively engage in online learning activities. The third dimension examined in this study is group

interaction, which pertains to the interaction skills demonstrated by learners within a group setting in the online learning environment. This dimension focuses on the various aspects of group dynamics and the skills necessary for effective collaboration and interaction among group members. Group interaction involves several key skills that contribute to productive group work and successful achievement of shared goals. These skills include exploratory questions, cumulative reasoning, and handling conflicts.

2. Methodology

The purpose of this study is to describe the learning experiences of Romanian students enrolled in a cross-cultural, cross-disciplinary course, CL applying the VPBL method. By assessing the learning outcomes and investigating the perceptions, reflections, and narratives of the participants, this research aims to provide a detailed and nuanced understanding of how this innovative pedagogical approach impacts the learning outcomes of Romanian students. Additionally, this study seeks to examine the potential of the VPBL method, specifically in the context of the CL approach, for fostering cross-cultural understanding and facilitating knowledge integration across multiple disciplines. Through mixed research methods such as standardized questionnaires and reflective journals, this study aims to generate valuable insights that contribute to the existing body of knowledge on VPBL and its applicability in diverse educational settings. Ultimately, the outcomes of this study are expected to offer practical implications for higher education curricular designers and policymakers who are interested in incorporating effective pedagogical strategies to enhance student learning experiences in cross-cultural and cross-disciplinary courses.

Research question: How does Romanian students experience the Classroom Laboratory course?

Research objectives:

The primary objectives of this study are as follows:

1. To evaluate the effects of the VPBL teaching method, as implemented within the CL, a cross-cultural and cross-disciplinary course, on students' self-assessed learning outcomes.
2. To provide a comprehensive description of the CL experience from the reflections of the students, focusing on three key dimensions: knowledge, emotions, and competencies.

Research design

This research employed a quasi-experimental study design, incorporating mixed methods to assess the impact of the VPBL teaching method within a cross-cultural and cross-disciplinary educational setting. The learning outcomes were comprehensively

evaluated through a mixed methodology approach, combining quantitative questionnaires and qualitative reflective journals. This methodological choice allowed for an in-depth analysis of the learning outcomes by integrating standardized measurements with the perspectives of the students themselves.

Participants

Data were collected from a convenience sample comprising 24 students who were enrolled in the CL, a transversal course offered at the West University of Timisoara, Romania (WUT) and the Norwegian University of Science and Technology (NTNU). At the WUT, students are required to select a transversal course for three semesters that diverges from their primary specialization. In this context, the CL was proposed as one such transversal course, designed to develop the transversal skills demanded by the labor market. While a total of 27 Romanian students participated in this transversal course, the research included only 24 students who completed all the requisite processes, including the evaluation tools and active participation in course activities. The majority of the participants in this study consisted of women, accounting for 70.83% of the sample. In terms of academic year, 54.16% of the participants were enrolled in their second year, the rest in the third year of study. The participants represented a diverse range of specializations, including Human Resources, Preparatory and Primary School Pedagogy, Medical Chemistry, Kinetotherapy and Special Motricity, Informatics (in English Language), Digital Media, Territorial Planning, Economy Informatics, Applied Modern Languages, Geography, Informatics, Sociology, Fine Arts, Biochemistry, Physical Education and Sports, and Music. For analytical purposes, the participants were classified into two categories based on their specialization: STEM subjects, consisting of 13 participants (54.16%), and non-STEM subjects, consisting of 11 participants (45.84%).

Instruments

For a more comprehensive description of the student experience, quantitative and qualitative methods were used to compile the data. The quantitative instrument was composed by incorporating two dimensions (online self-regulation and competence development) with 11 scales from the Project-based Learning Survey (Wu et al., 2021) and one dimension (group interaction) with three scales from the Group Interaction Questionnaire (Visschers-Pleijers et al., 2005). The assessment instrument comprised a total of 55 items, each rated on a 5-point Likert scale. A higher score on the scale indicated a greater level of proficiency or ability in the measured areas. The objective of using this instrument was to assess students' learning outcomes across three dimensions: learning skills developed through the VPBL method, transversal skills, and collaborative skills within a group setting. By conducting measurements of these dimensions at both the beginning and conclusion of the course, it will enable the assessment of students' progress and ascertain the effectiveness of the implemented teaching method. The

qualitative component of the research involved the utilization of an online learning journal, which served as a platform for students to engage in reflective practices encompassing three key dimensions: knowledge, competencies, and emotions. Within this framework, the students were prompted to respond to various reflection themes through online tasks. However, this study focuses on the analysis of student reflections pertaining to two specific themes: (1) the articulation of their thoughts, emotions, and expectations in relation to the CL joint course, and (2) the description of what they learned and how they acquired knowledge within the CL learning experience.

Procedure

The collaboration between WUT and NTNU resulted in the joint design and implementation of the CL course. For the academic year under analysis in this article, 2021-2022, the course underwent collaborative development by both universities six months prior to its commencement. In the frame of the EEA 21-COP-0004 VR-classrooms project, building upon the insights derived from the previous edition, adjustments were made, leading to the formulation of the course structure described in the following section. The course spanned a duration of seven weeks, encompassing two modules per week, with three hours allocated for each module. During this period, Romanian and Norwegian students interacted and collaborated exclusively online, in virtual classrooms. The administration of the quantitative instrument took place in the pretest and posttest phase, both at the onset of the course and in its final week. Additionally, the reflection journal was administered at the conclusion of each of the seven weeks. However, for the purposes of this article, the analysis focused on three specific time points, following the TTT model proposed by Dincă et al. (2023): the end of the first meeting, the fourth week (mid-course), and the seventh week.

Classroom laboratory: an innovative course

The Classroom Lab course brought together teachers, students, researchers, and experts from two universities, UVT from Romania and NTNU from Norway, as well as various organizations from Romania. The main objective of the course is to develop a set of transversal competencies in students from different specializations and study programs, within an authentic learning context that aims to closely resemble real-life situations and the work life of the future graduates students.

The NTNU and WUT teachers and researchers collaborated in designing the CL course and continuously sought to improve it over the course of its implementation. In addition to its instructional purpose of teaching and developing competencies, the course also incorporated a research component, as we believe that teaching should be evidence-based.

The competencies we aimed to develop are the transversal competencies of the future, such as interdisciplinary teamwork, decision-making, critical thinking, reflective

practice and effective communication. The curriculum design of the course revolved around VPBL method, addressing real-life problems that individuals may encounter in a global labor market. Among the social issues tackled were the integration of people with disabilities, the integration of Roma ethnic minority individuals, the integration and reintegration of former offenders, as well as current issues like the climate-change and energy crisis. These social issues were suggested by specialists or representatives from various organizations in Romania with whom we collaborated. Throughout the instructional activities, these individuals willingly acted as resource persons whom students could consult for resolving real-life situations.

The course was conducted collaboratively, entirely in an online format, over a duration of 28 hours. The students were organized into mixed teams, consisting of students from various specializations across the two universities. The range of specializations was extensive, encompassing STEM and non-STEM fields. The course also included several meetings in which the teams of Romanian and international professors provided input on topics related to distance communication or social issues. On a weekly basis, during a three-hour time slot, students and professors from the two universities would meet for counseling sessions, guidance, and the presentation of project progress and interactions. Time was allocated for student-to-student meetings as well as for addressing any uncertainties or challenges they may have encountered.

Throughout the course, students worked together, reaching a mutual agreement on a research topic and making efforts to understand the chosen subject matter, as well as identifying possible solutions to the selected issue. The students had the freedom to choose their own platforms or means of digital communication, decided on the mode of collaboration, and negotiated their interaction, task distribution and learning time together.

Student assessment was conducted through the presentation of projects, but an essential component of the evaluation process was also the students' reflections and assessment of their own engagement and learning process. Specialists or representatives from various NGOs interested in the addressed issues were invited and participated in the evaluation sessions.

Implementing this course, bringing together students from different educational systems, different specializations, and diverse cultural backgrounds, posed a significant challenge for both the students and us, as educators. One aspect that has been improved from one year to another was the allocation of two sessions before the commencement of shared activities among students, aimed at explaining the course's execution to the Romanian students and developing a set of skills necessary for teamwork interactions in different cultural contexts, which were insufficiently or even not developed within the Romanian educational system.

CL is an innovative course because it is co-constructed throughout its implementation. It is not a course consisting of a set of lectures or tasks that are related to artificial or simulated real-life contexts. Co-construction is achieved by students

themselves, through their involvement in choosing a topic, a social problem from the public agenda, for which they must study it in an interdisciplinary team and with the contribution of local experts, and find realistic solutions to the identified problem. We believe that the strong reflective component on their own learning process and the analysis of their learning journey alongside others are elements that should be integrated into the university curriculum.

3. Results

Quantitative data analysis

Learning outcomes

The instrument utilized in this study assessed a total of 14 skills, categorized into three dimensions, administered at two different time points: pretest and posttest. The 14 skills encompassed the following:

1. Online self-regulation (OS) dimension:
    - Goal setting (GS)
    - Environment structuring (ES)
    - Task strategies (TS)
    - Time management (TM)
    - Help seeking (HS)
    - Self-evaluation (SE)
2. Competence development dimension (CD):
    - Creativity (CRE)
    - Complex Problem-Solving (CPS)
    - Meta-Cognitive Awareness (MCA)
    - Collaboration (COL)
    - Communication (COM)
3. Group interactions dimension (GI):
    - Exploratory questions (EQ)
    - Cumulative reasoning (CR)
    - Handling conflicts (HC)

To address the first objective of this study, which was to evaluate the effects of the VPBL teaching method implemented within CL on students' learning outcomes, descriptive statistics and pretest-posttest comparisons were conducted. The data analysis involved the utilization of the IBM SPSS Statistics (Version 20) statistical software to perform the necessary statistical calculations. By employing these analytical techniques, the researchers aimed to examine the changes in students' learning outcomes before and after their engagement with the VPBL teaching method in the CL course.

To determine the strengths and weaknesses in students' self-evaluated abilities, descriptive statistics were employed to analyze the measured variables. This analysis was conducted at two levels: the entire participant group and separate subgroups

consisting of students enrolled in STEM and non-STEM specializations (Table 1). By conducting separate analyses for these two groups, the researchers aimed to identify any differences in the representation of abilities and dimensions between STEM and non-STEM students. This approach allowed for a comprehensive assessment of the self-evaluation results, enabling the identification of both common and distinct patterns in the perceptions of abilities and dimensions within each group.

Table 1:

The hierarchy of skills presented increasingly (by mean value) at pretest and posttest.

Whole group (N=24)				STEM (N=13)				Non-STEM (N=11)			
T1	**M**	**T2**	**M**	**T1**		**T2**	**M**	**T1**	**M**	**T2**	**M**
TS	2.94	HC	3.00	HC	3.12	HC	3.10	TS	2.61	HC	2.87
HC	2.97	TS	3.36	TS	3.23	TS	3.57	HC	2.78	TS	3.11
TM	3.15	TM	3.38	TM	3.33	TM	3.61	SE	2.88	TM	3.12
SE	3.25	SE	3.60	SE	3.55	SE	3.98	TM	2.93	SE	3.15
CRE	3.45	CRE	3.78	CRE	3.61	CRE	3.98	HS	3.15	CRE	3.54
HS	3.62	MCA	3.91	MCA	3.92	MCA	4.15	CRE	3.27	HS	3.56
EQ	3.69	HS	3.93	EQ	4.00	HS	4.25	EQ	3.34	MCA	3.63
MCA	3.70	ES	4.08	HS	4.01	ES	4.26	CR	3.34	CR	3.81
CR	3.76	EQ	4.15	CR	4.11	GS	4.30	MCA	3.43	CPS	3.84
GS	3.93	CR	4.18	GS	4.16	EQ	4.40	COM	3.50	ES	3.86
COM	3.94	GS	4.21	COL	4.30	COM	4.50	CPS	3.52	EQ	3.86
CPS	3.97	COM	4.22	COM	4.32	CR	4.50	ES	3.54	COM	3.90
ES	3.98	CPS	4.23	ES	4.36	COL	4.56	GS	3.65	GS	4.10
COL	4.02	COL	4.44	CPS	4.36	CPS	4.57	COL	3.69	COL	4.30
GI	3.47	OS	3.76	GI	3.74	OS	4.00	OS	3.13	OS	3.48
OS	3.48	GI	3.78	OS	3.77	GI	4.00	GI	3.15	GI	3.52
CD	3.82	CD	4.12	CD	4.10	CD	4.35	CD	3.48	CD	3.84

At the whole group level, the initial self-perceived skill that received the highest rating was collaboration (M=4.02), indicating that students believed they possessed strong collaborative abilities. Conversely, the skill perceived as least developed at the beginning of the course was task strategies (M=2.94), suggesting that students felt they had room for improvement in this area.

When examining the STEM subgroup, both at the beginning and end of the course, complex problem-solving (M=4.36) was identified as the skill with the highest self-perceived competency. On the other hand, handling conflicts (M=3.12) was perceived as the least developed skill within this subgroup.

In the non-STEM subgroup, collaboration (M=3.69) was regarded as the most proficient ability, while task strategies (M=2.61) were seen as the least developed skill.

Upon completion of the course, the hierarchy of self-perceived abilities did not undergo significant changes for both the whole group and the STEM and non-STEM subgroups. The relative strengths and weaknesses remained consistent, indicating a degree of stability in the students' self-perceptions over the duration of the course.

Measuring progress

To ascertain the presence of positive learning outcomes following students' participation in the CL, specifically in terms of skill development, a paired sample t-test was conducted at the whole group level.

A paired-samples t-test was used to determine whether there was a statistically significant mean difference between the posttest and pretest values of the three measured dimensions (Table 2). All the abilities from the three dimensions increased significantly post intervention: group interaction (t=2.62, p=.015, d=0.53); competence development (t=2.69, p=.013, d=0.55); online self-regulation (t=2.64, p=.015, d=0.53).

Table 2:

Results of paired sample t test posttest-pretest 3 VPBL dimensions

Dimension	Posttest		Pretest		t(23)	p	Cohen`s d	Strength
	M	*SD*	*M*	*SD*				
Group interaction	3.78	.54	3.47	.59	2.62	.015	.53	Medium
Competence development	4,12	.53	3.82	.69	2.69	.013	.55	Medium
Online self-regulation	3.76	.62	3.48	.71	2.64	.015	.53	Medium

Also, a paired sample t test was conducted to determine the students` progression on the 14 specific skills. In Table 3 only the significant differences are presented.

Table 3:

Results of significant differences of the paired sample t test posttest-pretest 14 VPBL skills

Abilities	Posttest		Pretest		t(23)	p	Cohen`s d	Strength
	M	*SD*	*M*	*SD*				
Goal setting	4.21	.50	3.93	.74	2.13	.044	.43	Small
Task strategies	3.36	.90	2.94	.98	2.87	.009	.58	Medium
Self-eval	3.60	.84	3.25	.70	2.87	.009	.58	Medium
Creativity	3.78	.55	3.45	.72	2.36	.027	.48	Small
Collaboration	4.44	.64	4.02	.86	2.41	.024	.49	Small
Exploratory in	4.15	.54	3.69	.74	3.47	.002	.71	Medium
Cumulative re	4.18	.61	3.76	.73	2.84	.009	.58	Medium

The abilities that increased significantly post intervention were: goal setting (t=2.13, p=.044, d=0.43); task strategies (t=2.87, p=.009, d=0.58); self-evaluation (t=2.87, p=.009, d=0.58); creativity (t=2.36, p=.027, d=0.48); collaboration (t=2.41, p=.024, d=0.49); exploratory inquiry (t=3.47, p=.002, d=0.58); cumulative reasoning (t=2.84, p=.009, d=0.58). Out of the 14 skills measured, seven skills demonstrated improvement following

the intervention. The magnitude of the effect sizes varied, with some exhibiting small effects while others showed medium effects. Among the measured skills, exploratory inquiry exhibited the greatest effect size, indicating a notable improvement. Following exploratory inquiry, the skills that displayed relatively stronger effects were task strategies, self-evaluation, and cumulative reasoning. These findings suggest that the intervention, namely the Classroom Laboratory, had a positive impact on these skills, albeit with varying degrees of effectiveness.

Differences between STEM and non-STEM students

An independent samples t-test was used to determine whether there was a statistically significant mean difference between the STEM and non-STEM values of the three measured dimensions (Table 4). All the abilities from the three dimensions were significantly higher for the STEM students from the beginning: group interaction (t=2.66, p=.016, d=2.66); competence development (t=2.24, p=.043, d=2.24); online self-regulation (t=2.36, p=.030, d=2.36). Also, in table 4 the significant mean differences for the VPBL abilities are presented. The students that studies STEM specialties have significant better abilities than non-STEM students for: help seeking (t=4.56, p=.044, d=2.30); self-evaluation (t=2.54, p=.019, d=2.54); complex problem solving (t=2.78, p=.016, d=2.78); meta cognitive abilities (t=5.60, p=.027, d=1.45); communication (t=2.56, p=.024, d=2.56); exploratory inquiry (t=2.26, p=.04, d=2.26); cumulative reasoning (t=2.61, p=.013, d=0.81).

Table 4:

Results of significant differences for the independent sample t test posttest-pretest 14 VPBL skills and dimensions

Dimension/ ability	STEM		Non-STEM		t	p	Cohen`s d	Strength
	M	*SD*	*M*	*SD*				
Help seeking	4.91	.61	4.35	.90	4.56	.044	2.30	Large
Self-eval	3.55	.57	2.88	.69	2.54	.019	2.54	Large
Complex Prob	4.36	.34	3.52	.95	2.78	.016	2.78	Large
Meta cognitiv	3.92	.62	3.43	1.00	5.60	.027	1.45	Large
Communication	4.32	.41	3.50	1.00	2.56	.024	2.56	Large
Exploratory in	4.00	.44	3.34	.87	2.26	.040	2.26	Large
Cumulative re	4.11	.42	3.34	.82	2.61	.013	2.81	Large
Group interact	3.74	.45	3.15	.60	2.66	.016	2.66	Large
Competence	4.10	.36	3.48	.85	2.24	.043	2.24	Large
Online selfreg	3.77	.50	3.13	.77	2.36	.030	2.36	Large

Out of the 14 skills measured, STEM students rated seven skills as more developed compared to non-STEM students (Table 4). The effect sizes observed were of large magnitude, indicating a substantial difference between the two groups. Among these skills, cumulative reasoning exhibited the greatest effect size, followed by complex problem solving. These findings emphasize the distinct strengths of STEM students in these particular skills.

To examine whether there were differential progress outcomes between students enrolled in STEM specializations and non-STEM students following the intervention, a t-test for dependent samples was conducted. This statistical analysis compared the pretest and posttest scores within each group separately, allowing for a comparison of progress made by students in STEM specializations versus non-STEM specializations.

Table 5:

Results of significant differences for the paired sample t test pretest 14 VPBL skills STEM students

Dimension/ ability	Posttest		Pretest		t	p	Cohen`s d	Strength
	M	*SD*	*M*	*SD*				
Task strategies	3.57	1.02	3.23	1.02	2.54	.026	0.63	Medium
Self-eval	3.98	.73	3.55	.57	3.54	.019	0.72	Medium
Exploratory in	4.40	.50	4.00	.54	3.00	.011	0.83	Large
Cumulative re	4.50	.55	4.11	.42	2.30	.040	0.64	Medium
Group interact	4.00	.43	3.74	.45	2.29	.040	0.63	Medium
Competence	4.35	.44	4.10	.36	2.34	.037	0.64	Medium
Online selfreg	4.00	.62	3.77	.50	2.21	.047	0.61	Medium

For students studying STEM specializations, a significant progress was registered, with an average effect, for all three dimensions (Table 5): group interaction (t=2.29, p=.040, d=0.63); competence development (t=2.34, p=.037, d=0.64); online self-regulation (t=2.21, p=.047, d=0.61). Also, significant progress was observed on four abilities: task strategies (t=2.54, p=.026, d=0.63); self-evaluation (t=3.54, p=.019, d=0.63); exploratory inquiry (t=3.00, p=.011, d=0.72); cumulative reasoning (t=2.30, p=.040, d=0.64). The greatest progress with the greatest magnitude of effect was observed for exploratory inquiry.

Among students studying non-STEM disciplines, the analysis revealed no significant progress in any of the three dimensions or the 14 measured abilities. This implies that the intervention implemented in the Classroom Laboratory did not lead to notable improvements in the skills assessed within this particular subgroup. These findings highlight the need for further investigation and potential modifications in the instructional approach to effectively address the learning needs of students enrolled in non-STEM disciplines.

Qualitative findings

To gain a deeper understanding of the impact of the VPBL method and the CL course on the students, qualitative methods were also employed in this study. The students were instructed to keep a learning journal throughout the 7-week duration of the course, during which they worked on projects centered on social themes. In this study, we specifically analyze the responses related to two themes from the journal entries. The

first theme focused on the students' reflections regarding their thoughts, emotions, and expectations in relation to the CL joint course. The second theme aimed to capture the students' descriptions of what they learned and how they acquired knowledge within the CL joint course experience. The students' responses were considered at three different phases of the course, following the TTT model proposed by Dincă et al. (2023), namely in week one, week four, and week seven.

To address the research question of how Romanian students experienced the CL course, an inductive thematic content analysis was conducted on the students' journal entries. This analysis aimed to identify and explore emerging themes and patterns within the data. The findings derived from this content analysis are presented in the subsequent sections, providing valuable insights into the students' experiences throughout the course.

During the analysis, four main themes emerged, capturing various aspects of the students' experiences in the CL course. These themes include the perception of CL as a good practice for the development of transversal skills, CL as an opportunity for personal development, the cultural differences observed among Norwegian students, and qualitative assessments of the CL course. These themes will be further examined and analyzed in relation to the three phases of the TTT model: teambuilding, teamwork, and team performance. During the initial phase of teambuilding, students engaged in the establishment of relationships with their partners, undergoing a process of knowledge acquisition and self-discovery. Furthermore, this phase fostered the development of trust and facilitated the identification of effective communication strategies within the cross-cultural online environment. During the middle phase of the course, which is characterized by teamwork, the students actively engaged in the process of project realization, with a particular emphasis on the work process. This stage provided an opportunity for the students to further develop their communication, collaboration, and problem-solving skills. The final phase of the course, known as team performance, marks the culmination of the students' efforts as they complete their projects and reflect upon their overall learning experience. During this phase, the students assess their performance as a team and draw conclusions regarding the knowledge and skills acquired throughout the course. It is a critical stage where they evaluate their collective achievements, identify areas of improvement, and reflect on the impact of their collaborative efforts.

CL as a good practice for the development of transversal skills

In their learning journals, numerous students made references to various transversal skills, including communication, teamwork, and cultural understanding. Each of these skills will be analyzed individually and examined in relation to their evolution throughout the course. By closely examining the students' reflections, we aim to assess the impact of the CL approach on the development of these transversal skills.

Communication

Communication is recognized as a crucial skill not only within the context of learning but also in learning groups and professional environments. This importance is further magnified in the cross-cultural setting of the CL course, where communication occurred primarily online and in English. The emphasis on communication during the teambuilding phase highlights its significance in establishing a solid foundation for collaborative work and ensuring effective interaction among participants.

During the initial stages of the course, students expressed challenges encountered in the communication process, particularly due to the utilization of English as the primary language and the involvement of non-native speakers, including foreign partners. Many students described feelings of anxiety, embarrassment, and a lack of confidence in their English communication abilities. They acknowledged that language proficiency served as a potential barrier to effective communication, emphasizing the need for the development of communication skills to ensure project success. Additionally, students initially encountered difficulties in understanding the varied accents present among Norwegian students when communicating in English. However, with time, they quickly adapted and became accustomed to the different accents, thereby enhancing their ability to comprehend and engage in effective cross-cultural communication. Throughout the subsequent weeks of the course, students consistently emphasized the significance of effective communication in various aspects, such as decision-making, argumentation, and problem-solving. As the course progressed, the language barriers that initially posed challenges were successfully overcome. Romanian students demonstrated an increased level of confidence in their communication skills, which facilitated their active participation in discussions and enabled them to effectively express their ideas and opinions. At the conclusion of the course, the students expressed highly positive sentiments regarding the progress made in their communication skills. They viewed the CL course as a valuable opportunity to enhance their proficiency in English communication and to bolster their confidence in this particular aspect. The students acknowledged the significance of engaging in cross-cultural collaboration and recognized the course's contribution to their growth and development.

"*I was very emotional and shy at the beginning, but I don't regret that I participated in this course; on the contrary, I communicated more in the last 2 months than in the last 2 years (within WUT, with other students)*" (STEM student 21).

Teamwork

The VPBL teaching method is fundamentally centered around teamwork, thereby naturally facilitating the development of teamwork skills. In the initial stages of the course, students frequently referenced the challenges associated with teamwork, yet simultaneously discovered its inherent value and benefits. During the teamwork phase, the students acquired a comprehensive understanding of the essential principles

underpinning effective collaboration and recognized the necessity of adhering to these principles to ensure optimal outcomes. Moreover, they experienced firsthand the significance of trust and mutual reliance within a team, realizing that through collaboration, they could learn and accomplish more collectively. As the projects neared completion in the final phase, the students expressed their pride in the final product and conveyed gratitude for the valuable lessons learned through collaboration with diverse individuals. Their reflections underscored the transformative impact of the CL course in cultivating teamwork skills, fostering a sense of unity, and cultivating a deep appreciation for the power of collective effort.

"*In these past weeks, I have learned a lot of new things and ways of looking at a problem, all of which can be attributed in large part to the fact that our groups were so diverse that I couldn't help but have a great time learning*" (STEM student 19).

Cultural understanding

Cultural understanding emerged as a skill that was directly nurtured through the process of cross-cultural collaboration. Over the duration of the course, the students keenly observed and acknowledged the disparities between themselves and their Norwegian colleagues. Initially, a sense of timidity and reservation prevailed, with some students inadvertently undervaluing their own contributions in the presence of their international peers. However, as they engaged in interactive discussions and collaborated on various projects, a remarkable transformation occurred. Gradually, the students began to relax and shed their inhibitions, recognizing that they were not inherently inferior but rather uniquely positioned to appreciate and embrace the diversity inherent in their collaborative efforts. Through these experiences, they came to realize that cultural differences served as invaluable opportunities for learning and personal growth. In fact, several students even adopted the behaviors and learning approaches exhibited by their Norwegian counterparts as role models, further attesting to the profound impact of cross-cultural collaboration in fostering cultural understanding and nurturing a spirit of inclusivity. *"I saw differences between Romanian and Norwegian cultures, differences that I thought about a lot after I left the meeting. I learned a lot about them, about me, and about diversity. Very interesting experience*!" (non-STEM student 17).

CL as a good opportunity for personal development

The students' reflections extended beyond the domain of professional and transversal skills, encompassing personal introspection and self-analysis. Particularly during the initial phase of mutual acquaintance and self-reflection, as well as during the concluding phase of drawing insights, these introspective considerations were prominent. In the initial phase, a notable trend was observed wherein students displayed a tendency to underestimate their own worth in the presence of their Norwegian colleagues. They candidly expressed feelings of shyness, fear, and withdrawal resulting from a lack of self-

confidence. However, as they actively collaborated on projects, a transformative shift occurred. Gradually, the students gained confidence in their abilities, became more open and engaged, and even experienced a sense of enjoyment and fulfillment. Upon conducting the final analysis, several students declared that their participation in the course had significantly increased their self-confidence and facilitated personal development. It became evident that the CL course not only served as a catalyst for professional growth but also as a platform for enhancing self-confidence and fostering personal transformation. "*I also learned to open up more to new people, to be empathetic and understanding, and to be altruistic by the fact that during the 7 weeks in which I participated in the courses of this discipline, I had to be like this and behave accordingly*" (STEM student 11).

Cultural differences observed among Norwegian students.

From the beginning, the Romanian students expressed great interest in the cross-cultural aspect of the course. They keenly observed the Norwegian students and frequently engaged in reflective observations. Initially, these observations were characterized by a sense of inferiority, as the Romanian students held the Norwegian students in high regard, perceiving them to possess excellent English language skills and an easygoing nature. However, over time, a transformation occurred in their perspective, as the Romanian students began to observe the Norwegians from a position of equality. They noted the Norwegians' patience, attentiveness, active involvement, and conscientiousness. By the course's conclusion, the Romanian students came to the realization that they had much to learn from their Norwegian colleagues, particularly in terms of ease, relaxation, and the joy of interpersonal interactions. The majority of students expressed that collaborating with their Norwegian peers was a genuine pleasure from which they gained valuable insights and experiences. "*Seeing them, I noticed that my confidence increased that I could also someday create this type of atmosphere and this feeling of "naturalness" in learning*" (STEM student 7).

Qualitative assessments of the CL course

In their reflective journals, numerous students expressed their appreciation for the CL, particularly during the conclusion phase, as a distinct and rewarding learning experience. Several positive aspects stood out for the students. Foremost was the cross-cultural nature of the course, which enriched their perspectives and broadened their horizons. The project-based learning approach also garnered praise, as it provided them with opportunities for collaborative and experiential learning. Students valued the utilization of their critical thinking and problem-solving skills throughout the course. They also highlighted the practicality of CL, noting its non-directive nature and the absence of constant teacher intervention.

Furthermore, students acknowledged CL as a platform that facilitated their acquisition of new digital tools, such as PowerPoint Online, Canva, and virtual reality applications. The terms used to describe CL encompassed a range of positive sentiments: pleasant, beautiful, challenging, interactive, fun, and interesting. Students conveyed a sense of satisfaction, excellence, and excitement regarding their participation in the course. Many expressed a desire to repeat the experience if given the opportunity. "*In general, the discussions with my colleagues from other specializations, faculties, and even countries made me happy because I had the opportunity to learn so many new things. My expectations were high, I must admit, but they were more than exceeded*" (STEM student 15).

4. Discussion

The present study is conducted as part of the research activities undertaken within the project EEA 21-COP-0004 "Bringing Real Life into Virtual Classrooms" (VR-classrooms), implemented by the West University of Timisoara, Romania, in collaboration with the Norwegian University of Science and Technology, Norway. This project is supported by the EEA Financial Mechanism 2014-2021. Within the project, the CL model has been developed as a unique curricular approach that combines learning and research activities.

CL serves as both a learning and a research space, with the aim of integrating theory and practice. The central teaching method employed in CL is VPBL, which is implemented in a cross-cultural context. The students engage in collaborative projects, working in mixed groups consisting of both Romanian and Norwegian students. The primary objective is to address and solve social problems through the development of projects. Other studies researched PBL in cross-disciplinary (MacLeod & van der Veen, 2019; St John et al., 2023) or cross-cultural context (Shadiev et al., 2015), some with technology (ChanLin, 2008) and online delivery (Çakiroğlu & Erdemir, 2018). Unlike other research that studied these variables separately, our research observes the cumulative effect, with an emphasis on cross-cultural learning context.

Through the collaborative nature of the projects, students had the opportunity to develop transversal skills that are highly valued in the labor market. These skills go beyond professional knowledge and include competencies such as communication, teamwork, critical thinking, and problem-solving.

The aim of this study is to investigate the impact of the VPBL method within the CL course on students' learning outcomes. Many studies recognize the difficulties of assessment of the learning outcomes and students' progress in PBL settings (Wengrowicz et al., 2016). By employing a mixed-methods approach, combining quantitative and qualitative data analysis, this research seeks to overcome these difficulties and provide a comprehensive understanding of the effects of CL on students' skill acquisition and overall learning experiences.

The measurement of transversal skills within the CL course was conducted using a questionnaire comprising three dimensions and a total of 14 transversal skills. The purpose of this measurement was to assess the progress made by students in the development of these skills throughout the course.

The findings reveal significant progress in students` learning outcomes (similar with Mares et al., 2021). The progress was significant in all three dimensions and specifically in seven of the measured transversal skills. These skills include goal setting (Kokotsaki et al., 2016), task strategies (similar with Kalemkuş & Bulut-Özek, 2022), self-evaluation (Başbay & Ateş, 2009), creativity (Biasutti & EL-Deghaidy, 2014), collaboration (Asan & Haliloglu, 2005), exploratory inquiry, and cumulative reasoning (similar with Romera et al., 2016). The significant improvement observed in these skills indicates the successful application of CL in promoting the development of transversal competencies among students, especially skills related to learning management (similar to Ali et al., 2013), collaborative learning (similar with Li et al., 2015; Pinho-Lopes & Macedo, 2015) and problem solving (similar to Nation, 2008; Young & Legister, 2018).

The impact of the CL approach was also examined in relation to students studying STEM and non-STEM specializations. Many studies investigated the PBL in STEM (Evans et al., 2017; Ludwig et al., 2017; Buber & Unal Coban, 2023) or non-STEM disciplines (Li et al., 2015; Tanaka, 2022). In this study a comparison was made between the effectiveness of teaching with VPBL between students enrolled in STEM versus non-STEM majors. The objective was to assess whether there were differences in the development of transversal skills between these two groups. The results revealed notable disparities between STEM and non-STEM students, suggesting varying effects of CL on their skill development.

From the initial stages of the course, STEM students rated seven skills as more developed compared to their non-STEM colleagues, as studies revealed that STEM and PBL is the best combination (Lee et al., 2019). This discrepancy indicates that STEM students entered the CL course with a higher level of proficiency in these particular skills. The effect sizes observed were of large magnitude, indicating a substantial difference between the two groups. Among these skills, cumulative reasoning exhibited the greatest effect size, emphasizing the strength of STEM students in this particular skill. Additionally, complex problem-solving skills demonstrated a notable effect size, further underscoring the distinct strengths of STEM students in these areas (Tan et al., 2022).

Furthermore, when examining the progress made by students throughout the course, it was evident that STEM students showed significant advancements in all three dimensions and four specific skills. In contrast, non-STEM students did not exhibit significant progress in any of the dimensions or skills measured. This disparity raises important considerations regarding the instructional approach and support provided to non-STEM students within the CL context.

The findings suggest the need for further investigation into the factors that may contribute to the differential impact of CL on students from STEM and non-STEM

disciplines. It is crucial to identify and address potential barriers or limitations that may hinder the progress of non-STEM students in developing transversal skills. Modifications in the instructional approach, adapted interventions, or additional support may be necessary to enhance the learning experience and outcomes for non-STEM students.

These findings have significant implications for teachers and policymakers, as they highlight the importance of considering discipline-specific characteristics and learning needs when designing and implementing innovative instructional approaches, like CL. Addressing the unique challenges faced by non-STEM students can contribute to a more equitable and inclusive educational environment, ensuring that all students have equal opportunities for skill development and success.

In order to gain a more comprehensive understanding of the impact of the VPBL method and the CL course on the students, qualitative reflective journals analyses were incorporated in this study. The reflective journal was also used by other studies on PBL, being considered a valid and efficient evaluation method (Kim, 2017). A thematic content analysis was employed to examine the responses provided by the students in their reflective learning journals. The students' journal entries were analyzed at three different time points, aligned with the stages of the TTT model (Dincă et al., 2023). This analytical framework facilitated an examination of the students' learning progression and the overall impact of the CL course. Within these journal entries, four key thematic categories emerged, providing valuable insights into the students' experiences.

The first theme that emerged from the analysis centered on the perception of CL and VPBL as a method for developing transversal skills (similar with Bell, 2010; Biasutti & EL-Deghaidy, 2014). Students acknowledged the role of CL and VPBL in fostering the development of various skills essential for their future endeavors. Specifically, they recognized the importance of communication (Han et al., 2016), teamwork, cultural understanding (similar to Shadiev et al., 2015), and critical thinking (similar to Kim, 2017) as skills that were enhanced through their participation in the CL course. The second theme focused on CL as an opportunity for personal development. They described how their initial feelings of shyness, lack of confidence, and language barriers gradually transformed into increased self-assurance and self-efficacy (similar to Perrault & Albert, 2017), active engagement (similar to Lou & Kim MacGregor, 2004), and enjoyment of the learning process. The CL course provided a platform for students to challenge themselves, step out of their comfort zones, and develop personally. The third theme that emerged from the analysis pertained to the students' observations and reflections on the cultural differences between themselves and their Norwegian peers. Initially, students expressed feelings of inferiority and self-depreciation in comparison to the Norwegian students. However, as the collaboration progressed, they began to appreciate and value the diversity of perspectives, recognizing the learning opportunities presented by working with individuals from different cultural backgrounds. They also identified positive qualities in their Norwegian peers, such as patience, attentiveness, and conscientiousness, which they sought to emulate. The fourth and final theme revolved

around the students' general assessments of the CL course. Students expressed positive sentiments regarding their overall experience. They found the cross-cultural aspect of the course particularly intriguing and appreciated the project-based learning approach, group dynamics, and the opportunity to apply their critical thinking and problem-solving skills. Furthermore, they highlighted the practical nature of the course, the absence of constant teacher intervention, and the exposure to new digital tools as valuable aspects of their CL experience.

The present study has several potential limitations. Firstly, the study was conducted within the context of a specific project and involved a limited sample size of students from the partnering universities. The findings may not be generalizable to other educational settings or student populations. Further research with larger and more diverse samples is needed to enhance the external validity of the results.

Secondly, the study focused on the impact of the VPBL method and the CL course on the development of transversal skills and personal growth. Other factors that may influence student learning outcomes, such as prior knowledge, motivation, and individual learning styles, were not extensively examined in this study. Future research could consider incorporating a more comprehensive set of variables to gain a more nuanced understanding of the factors influencing student outcomes in CL environments.

Lastly, the study focused on the perspectives of Romanian students participating in a cross-cultural collaboration with Norwegian students. The potential differences in cultural backgrounds, educational systems, and learning contexts between the two groups may have influenced the results. It would be valuable to explore the experiences of students from other cultural backgrounds and educational contexts to further investigate the generalizability of the findings.

Despite these limitations, the current study offers valuable insights into the impact of the VPBL method and the CL course on students' transversal skill development, personal growth, and cross-cultural collaboration. The findings provide a foundation for further research and potential improvements in instructional approaches aimed at enhancing student learning outcomes in CL environments.

5. Conclusion

In conclusion, the present study investigated the impact of the VPBL method within the CL course on students' learning outcomes, with a particular focus on the development of transversal skills. The findings demonstrated significant progress in students' learning outcomes across all three dimensions and specifically in seven measured transversal skills. These skills encompassed goal setting, task strategies, self-evaluation, creativity, collaboration, exploratory inquiry, and cumulative reasoning. The results underscored the successful application of CL in promoting the development of transversal competencies among students, particularly in areas related to learning management, collaborative learning, and problem solving.

Moreover, the study explored the differential impact of the CL method on students studying STEM and non-STEM specializations. STEM students exhibited higher proficiency in several skills at the outset of the CL course, indicating distinct strengths in these competencies. Throughout the course, STEM students made significant advancements in all dimensions and specific skills, while non-STEM students did not exhibit significant progress. This discrepancy emphasizes the need for further investigation and potential modifications in the instructional approach to effectively address the learning needs of students enrolled in non-STEM disciplines within the CL context.

Qualitative analysis of students' reflective learning journals provided valuable insights into their experiences within the CL course. Students perceived CL as a method for developing transversal skills and acknowledged its role in fostering communication, teamwork, critical thinking, and cultural understanding. They also highlighted the personal development opportunities afforded by CL, the appreciation and understanding of cultural differences, and the overall positive assessments of the course. These findings reinforce the importance of the CL approach in facilitating skill development and personal growth among students.

Based on the findings and conclusions of the study, the following recommendations for practice could be proposed:

- Adjust instructional approaches for STEM and Non-STEM students: Recognize the differential impact of the VPBL method on students from STEM and non-STEM disciplines. Design instructional approaches that address the specific learning needs of non-STEM students, providing differentiated interventions and additional support to enhance their skill development within the CL context.
- Foster cross-cultural collaboration: Propose courses that take place in cross-cultural collaboration to foster cultural understanding among students. These courses promote an inclusive and respectful learning environment that values diverse perspectives and encourages students to learn from each other's cultural backgrounds.
- Emphasize transversal skill development: Integrate explicit instruction and activities focused on the development of transversal skills within the VPBL. Provide opportunities for students to enhance their communication, teamwork, critical thinking, and problem-solving abilities, as these skills are highly valued in the labor market and essential for future success.
- Continuously assess and provide feedback: Implement ongoing assessment strategies to monitor students' progress in transversal skill development. Regularly provide constructive feedback to students, highlighting areas for improvement and recognizing their achievements. This feedback loop promotes self-reflection, encourages growth, and enhances the overall learning experience.
- Promote self-reflection and metacognitive skills: Incorporate regular opportunities for students to engage in self-reflection and metacognitive practices. Encourage students to maintain reflective learning journals, where they can document

their experiences, challenges, and personal growth throughout the CL course. Facilitate guided reflections to help students become aware of their learning processes, set goals, and develop strategies for continuous improvement.

In conclusion, the present study contributes to the literature by highlighting the significant progress made by students in developing transversal skills through the VPBL method within the CL course. The findings emphasize the need to address the differential impact of CL on students from STEM and non-STEM disciplines and suggest potential modifications to enhance the learning experience and outcomes for non-STEM students.

Funding

This article was elaborated under the EEA Financial Mechanism 2014-2021, project 21-COP-0004 Bringing Real Life into Virtual Classrooms, implemented by the West University of Timisoara, Romania, in Partnership with the Norwegian University of Science and Technology, Norway.

Disclaimer

This work was realized with the EEA Financial Mechanism 2014-2021's financial support. Its content (text, figures, tables) does not reflect the official opinion of the Program Operator, the National Contact Point, or the Financial Mechanism Office. The responsibility for the information and views expressed herein lies with the authors.

References

Ali, W. Z. W., Bagheri, M., Abdullah, M. C. B., & Daud, S. M. (2013, March 1). Effects of Project-based Learning Strategy on Self-directed Learning Skills of Educational Technology Students. *Contemporary Educational Technology*, *4*(1). https://doi.org/10.30935/cedtech/6089

Arwatchananukul, P. Singpant, N. Chondamrongkul and N. Aunsri. (2022). Developing 21st Century Skills with Project-Based Learning: An Experience Report in the Introductory Course of Software Engineering. *Joint International Conference on Digital Arts, Media and Technology with ECTI Northern Section Conference on Electrical, Electronics, Computer and Telecommunications Engineering* (ECTI DAMT & NCON), Chiang Rai, Thailand, 2022, pp. 451-455, doi: 10.1109/ECTIDAMTNCON53731.2022.9720408

Asan, A. & Haliloglu, Z. (2005). Implementing Project Based learning in computer classroom. *The Turkish Online Journal of Educational Technology – TOJET, 4*(3): 68-80.

Başbay, M., & Ateş, A. (2009). The reflections of student teachers on project based learning and investigating self evaluation versus teacher evaluation. *Procedia - Social and Behavioral Sciences*, *1*(1), 242–247. https://doi.org/10.1016/j.sbspro.2009.01.044

Bates, A.W. (2005). *Technology, e-learning and distance education*. Psychology Press

Bell, S. (2010). Project-Based Learning for the 21st Century: Skills for the Future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *83*(2), 39–43. https://doi.org/10.1080/00098650903505415

Berge, T. (Ed.) (2020). *Classroom Laboratoy Reader.* Editura Sitech Publishing House Craiova

Biasutti, M., & EL-Deghaidy, H. (2014). Interdisciplinary project-based learning: an online wiki experience in teacher education. *Technology, Pedagogy and Education*, *24*(3), 339–355. https://doi.org/10.1080/1475939x.2014.899510

Broadbent, J., Panadero, E., Lodge, J. M., & Fuller-Tyszkiewicz, M. (2022). The self-regulation for learning online (SRL-O) questionnaire. *Metacognition and Learning, 18*(1), 135–163. https://doi.org/10.1007/s11409-022-09319-6

Buber, A., & Unal Coban, G. (2023). STEM project-based activity: bio-efficacy of microalgae. *Science Activities*, *60*(2), 71–89. https://doi.org/10.1080/00368121.2023.2168246

Çakiroğlu, N., & Erdemir, T. (2018). Online project based learning via cloud computing: exploring roles of instructor and students. *Interactive Learning Environments*, *27*(4), 547–566. https://doi.org/10.1080/10494820.2018.1489855

ChanLin, L. (2008). Technology integration applied to project-based learning in science. *Innovations in Education and Teaching International*, *45*(1), 55–65. https://doi.org/10.1080/14703290701757450

Clary, G., Dick, G., Yagmur Akbulut, A., & Van Slyke, C. (2022). The After Times: College Students' Desire to Continue with Distance Learning Post Pandemic. *Communications of the Association for Information Systems, 50*(1), 122–142. https://doi.org/10.17705/1cais.05003

Craşovan, M. (Ed.). (2022). *Curricular Package Design for Transversal Competencies Development in Virtual Classrooms*. Presa Universitara Clujeana.

Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Dincă, M., Luştrea, A., Oniţiu, A., Craşovan, M., & Berge, T. (2021). The Effects of Disciplinary Composition on Virtual Learning Group Process Dynamics: Students' Perspectives. *Sustainability*, *13*(15), 8493. https://doi.org/10.3390/su13158493

Dincă, M. (Ed.). (2022). *Learning outcomes` assessment in virtual classrooms*. Presa Universitara Clujeana.

Dincă, M., Luştrea, A., Craşovan, M., Oniţiu, A., & Berge, T. (2023a). Students' Perspectives on Team Dynamics in Project-Based Virtual Learning. *SAGE Open, 13*(1), 215824402211472. https://doi.org/10.1177/21582440221147269

Dincă, M., Lucheş, D., Luştrea, A. (2023b). *Reflective learning in cross-cultural and cross-disciplinary virtual classrooms*. Presa Universitara Clujeana.

Evans, R., Friedman, J., McGrath, L., Myers, P., & Ruiz, A. (2017). Math Path: Encouraging Female Students in Mathematics Through Project-Based Learning. *PRIMUS, 2*8(4), 287–299. https://doi.org/10.1080/10511970.2017.1339154

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. *Societies, 10*(4), 86. https://doi.org/10.3390/soc10040086

García-Álvarez, J., Vázquez-Rodríguez, A., Quiroga-Carrillo, A., & Priegue Caamaño, D. (2022). Transversal Competencies for Employability in University Graduates: A Systematic Review from the Employers' Perspective. *Education Sciences, 12*(3), 204. https://doi.org/10.3390/educsci12030204

Han, S., Capraro, R. M., & Capraro, M. M. (2016). How science, technology, engineering, and mathematics project based learning affects high-need students in the U.S. *Learning and Individual Differences*, *51*, 157–166. https://doi.org/10.1016/j.lindif.2016.08.045

IBM Corp. (2020). IBM SPSS Statistics for Windows (Version 20.0) [Computer software]. IBM Corp.

Kalemkuş, F., & Bulut-Özek, M. (2022). The effect of online project-based learning on metacognitive awareness of middle school students. *Interactive Learning Environments*, 1–19. https://doi.org/10.1080/10494820.2022.2121733

Kim, M. (2017). Project-based community participatory action research using geographic information technologies. *Journal of Geography in Higher Education*, *42*(1), 61–79. https://doi.org/10.1080/03098265.2017.1335294

Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). Project-based learning: A review of the literature. *Improving Schools*, *19*(3), 267–277. https://doi.org/10.1177/1365480216659733

Lee, Y., Capraro, R. M., & Bicer, A. (2019). Affective Mathematics Engagement: a Comparison of STEM PBL Versus Non-STEM PBL Instruction. *Canadian Journal of Science, Mathematics and Technology Education*, *19*(3), 270–289. https://doi.org/10.1007/s42330-019-00050-0

Li, D., Zhang, C., & He, Y. (2015). Project-based learning in teaching translation: students' perceptions. *The Interpreter and Translator Trainer*, *9*(1), 1–19. https://doi.org/10.1080/1750399x.2015.1010357

Lou, Y., & Kim MacGregor, S. (2004). Enhancing Project-Based Learning Through Online Between-Group Collaboration. *Educational Research and Evaluation*, *10*(4–6), 419–440. https://doi.org/10.1080/13803610512331383509

Ludwig, P., Tongen, A., & Walton, B. (2017). Two Project-Based Strategies in an Interdisciplinary Mathematical Modeling in Biology Course. *PRIMUS*, *28*(4), 300–317. https://doi.org/10.1080/10511970.2016.1246495

MacLeod, M., & van der Veen, J. T. (2019). Scaffolding interdisciplinary project-based learning: a case study. *European Journal of Engineering Education*, *45*(3), 363–377. https://doi.org/10.1080/03043797.2019.1646210

Mantra, I. B. N., Handayani, N. D., & Pramawati, A. A. I. Y. (2022). Problem-Based Learning and Project-Based Learning Integration in Online Learning to Enhance Students' Critical and Creative Thinking Skills. *Jurnal Pendidikan Progresif,* 184–195. https://doi.org/10.23960/jpp.v12.i1.202215

Maros, M., Korenkova, M., Fila, M., Levicky, M., & Schoberova, M. (2021). Project-based learning and its effectiveness: evidence from Slovakia. *Interactive Learning Environments*, 1–9. https://doi.org/10.1080/10494820.2021.1954036

Myyry, L., Kallunki, V., Katajavuori, N., Repo, S., Tuononen, T., Anttila, H., Kinnunen, P., Haarala-Muhonen, A., & Pyörälä, E. (2022). COVID-19 Accelerating Academic Teachers' Digital Competence in Distance Teaching. *Frontiers in Education, 7*. https://doi.org/10.3389/feduc.2022.770094

Nation, M. L. (2008). Project-Based Learning for Sustainable Development. *Journal of Geography*, *107*(3) , 102–111. https://doi.org/10.1080/00221340802470685

Perrault, E. K., & Albert, C. A. (2017). Utilizing project-based learning to increase sustainability attitudes among students. *Applied Environmental Education & Communication*, *17*(2), 96–105. https://doi.org/10.1080/1533015x.2017.1366882

Pinho-Lopes, M., & Macedo, J. (2015). Project-based learning in Geotechnics: cooperative versus collaborative teamwork. *European Journal of Engineering Education*, *41*(1), 70–90. https://doi.org/10.1080/03043797.2015.1056099

Robson, L., Gardner, B., & Dommett, E. J. (2022). The Post-Pandemic Lecture: Views from Academic Staff across the UK. *Education Sciences, 12*(2), 123. https://doi.org/10.3390/educsci12020123

Romera, E. M., Gómez-Ortiz, O., Ortega-Ruiz, R., & Viejo, C. (2016). Influence of Project-based Learning Model in Knowledge Management of Educational Psychology Students. *The Anthropologist*, *25*(3), 199–206. https://doi.org/10.1080/09720073.2016.11892107

Shadiev, R., Hwang, W. Y., & Huang, Y. M. (2015). A pilot study: Facilitating cross-cultural understanding with project-based collaborative learning in an online environment. *Australasian Journal of Educational Technology*, *31*(2). https://doi.org/10.14742/ajet.1607

Shu-Jing Wu, Jiao Han, Fu-Rong Sun, Rong-Gen Wan & Yu-Quan Zhao (2021): An integrated model for exploring college students' engagement and competence development in flipped learning using partial least squares path modeling, *Interactive Learning Environments*. https://doi.org/10.1080/10494820.2021.1881799

St. John, J., St. John, K., & St. John, C. (2023). Learning by facilitating: A project-based interdisciplinary approach. *Journal of Education for Business*, 1–8. https://doi.org/10.1080/08832323.2023.2196049

Susilowibowo, J., & Tantri Hardini, H. (2019). Effectiveness of Project-based Learning Models to Improve Learning Outcomes and Learning Activities of Students in Innovative Learning. *KnE Social Sciences, 3*(11), 82–95. https://doi.org/10.18502/kss.v3i11.400

Tan, A. L., Ong, Y. S., Ng, Y. S., & Tan, J. H. J. (2022). STEM Problem Solving: Inquiry, Concepts, and Reasoning. *Science & Education*, *32*(2), 381–397. https://doi.org/10.1007/s11191-021-00310-2

Tanaka, M. (2022). Motivation, self-construal, and gender in project-based learning. *Innovation in Language Learning and Teaching*, *17*(2), 306–320. https://doi.org/10.1080/17501229.2022.2043870

Ulum, H. (2021). The effects of online education on academic success: A meta-analysis study. *Education and Information Technologies, 27*(1), 429–450. https://doi.org/10.1007/s10639-021-10740-8

Visschers-Pleijers, A. J. S. F., Dolmans, D. H. J. M., Wolfhagen, I. H. A. P., & van der Vleuten, C. P. M. (2005). Development and validation of a questionnaire to identify learning-oriented group interactions in PBL. *Medical Teacher*, *27*(4), 375–381. https://doi.org/10.1080/01421590500046395

Wang, S. (2022). Critical Thinking Development Through Project-Based Learning. Journal of Language Teaching and Research, 13(5), 1007–1013. https://doi.org/10.17507/jltr.1305.13

Wengrowicz, N., Dori, Y. J., & Dori, D. (2016). Meta-assessment in a project-based systems engineering course. *Assessment & Evaluation in Higher Education*, *42*(4), 607–624. https://doi.org/10.1080/02602938.2016.1173648

Young, J. H., & Legister, A. P. (2018). Project-Based Learning in International Financial Management. *Journal of Teaching in International Business*, *29*(1), 76–87. https://doi.org/10.1080/08975930.2018.1455943

Zhang, L., Carter, R. A., Qian, X., Yang, S., Rujimora, J., & Wen, S. (2022). Academia's responses to crisis: A bibliometric analysis of literature on online learning in higher education during COVID-19. *British Journal of Educational Technology, 53*(3), 620–646. https://doi.org/10.1111/bjet.13191

.

The Impact of Environmental Educational Programs in Promoting Insects Conservation Awareness: A Scoping Review

Geanina-Magdalena Sitar [•], Alina Simona Rusu[••]

Abstract

The decline of biodiversity and natural habitats, and the lack of progress in society's behaviour towards conservation, has prompted research into effective educational programs. Studies have shown that positive emotions towards nature, particularly in relation to the innate human predisposition towards the natural environment, can encourage environmentally friendly actions. As people's attitudes towards species are linked to familiarity and experiences, insects, and other invertebrates, despite their vital role in ecosystems, are often underappreciated and face inequalities in research and conservation. Negative attitudes towards insects are shaped by cultural and educational factors. Hence, education, particularly environmental education, can play a significant role in changing preconceptions and attitudes towards insects and fostering positive behaviour towards biodiversity conservation. This study presents a scoping review of environmental education programs focused on enhancing students' awareness of insects and their significance in the ecosystem (from 2000 to 2022). The aim was to analyse the effects of intervention programs and key characteristics that contributed to their efficiency. The review highlights the importance of program duration, outdoor experiences, and the use of inquiry-based and experiential learning methods in promoting positive attitudes and knowledge about insects. The findings have implications for the design and implementation of effective environmental education programs targeting insect awareness.

Keywords: insects' conservation; environmental educational programs; attitudes towards insects; pro-environmental behaviour.

1. Introduction

Over the last few decades, there has been a significant decline in biodiversity, as well as the fragmentation and loss of many natural habitats (Butchart et al., 2012; Ceballos et al.,

[•] PhD student, Doctoral School "Education, Reflection, Development", Faculty of Psychology and Sciences of Education, Babes-Bolyai University, Cluj-Napoca, Romania, giacob@yahoo.com
[••] PhD, Faculty of Animal Sciences and Biotechnologies, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania, alina.rusu@usamvcluj.ro

2015) Despite the warnings from the scientific community about the loss of biodiversity and the harmful effects of human activities on the environment (Díaz et al., 2006, Naeem et al., 2016), and even though there is a continuous effort in terms of education and prevention, there has been little progress in changing society's behaviour in the direction of biodiversity conservation (Balmford et al., 2021). Among many factors that can be considered in designing effective educational programs towards functional interactions with the environment, studies indicate that emotions, specifically positive feelings towards nature, can have a significant impact on encouraging environmentally friendly actions (Castillo-Huitrón et al., 2020; Chawla, 2007; Kals et al., 1999).

The human-nature relationship, depending on the nature of emotions, is often defined in terms of biophilia and biophobia. The concept of biophilia, originally proposed by Wilson (1984), refers to an innate and positive human predisposition to belong to the natural environment, which allows human individuals to experience benefits from interactions with other forms of life. When functional, these interactions can facilitate their development, adaptation, and survival (Gelter, 2000; Or, 1993). In contrast, biophobia is defined as the perception of elements of nature as anxiogenic, disgusting, or irrelevant (Orians, 2007; Orr, 1993), thus having the potential of impeding the development of functional human-nature interactions.

One factor identified in the literature that can influence the relationship between humans and nature is the frequency with which humans interact directly with nature (Soga et al., 2020). According to Miller (2005), this “extinction of experience” phenomenon, which was first discussed by Pyle in 1993, has been intensifying. It has been observed that more and more people, globally, and especially children, spend less and less time in direct interactions with nature (Soga & Gaston, 2016; Soga et al., 2020). Hence, outdoor activities have been replaced by screen-based activities, and this trend is concerning in terms of missing the evidence-based benefits of spending time in natural environments, which is known to improve the executive attention, to reduce the stress level and increase the general quality of life (for example, Gelter, 2000; Zhang et al., 2014). More and more authors state that if people do not have the opportunity to develop positive attitudes and responsible behaviour towards the environment through direct interactions, there is the risk that the future generations may be unable to recognise and/or ignore environmental problems, leading to long-term negative implications for human health and nature conservation (Johansson et al., 2012; Soga & Gaston, 2016; Zhang et al., 2014).

Insects as a tool for environmental education

In general, the importance and values given to species are closely related to people's experiences and familiarity with the species in question (Colléony et al., 2017; Martín-López et al., 2007). Conservation actions are often driven by public perception and species charisma (Bellon, 2019; Colléony et al., 2017), creating inequalities in research

and conservation. These inequalities in terms of public attention can be harmful for less popular groups, such as insects and other types of invertebrates (Cardoso et al., 2011). The attitudes of humans, especially those that are shaped by early education, can become a major impediment to the development of a mindset (translated in functional behaviors) oriented to global conservation of insect biodiversity (Cardoso et al., 2011; Samways, 2015).

The decline of insects, which has been a long-standing phenomenon, has only received increased attention from the scientific community in the last decade. In 2017, an article was published which presented the drastic situation of insects in Germany (Hallmann et al., 2017). The results of the study were surprising, showing a 76% decrease in the biomass of flying insect species in just 27 years. In line with their findings, the authors discuss the importance of creating awareness towards the vital roles of insects in ecosystem, such as pollinators, food resources for other taxa, maintaining of sole structure etc.

Insects and other terrestrial arthropods, commonly referred to as "insects," are one of the most underappreciated taxonomic groups of living organisms in the world, especially in developed countries (Lockwood, 2013; Prokop et al., 2010; Prokop & Randler, 2018; Shipley & Bixler, 2017). Studies show that negative emotions towards insects are shaped by culture and various forms of education (for example, parental, peer-based education, school provided education), as well as by the availability of information and direct experiences (Bjerke & Østdahl, 2004; Kellert, 1993; Soga et al., 2020). An important role in offering scientific knowledge and shaping appropriate attitudes and behaviours towards insects is played by the approach in the school curriculum. Thus, preconceptions regarding insects, and negative attitudes can be changed through education, more precisely through environmental education (Gralton et al., 2004). Innovative and critical education that arouses children's curiosity can achieve the goals of environmental education.

Environmental education (EE) is becoming an increasingly important facet of contemporary education systems (UNESCO, 1976). EE aims to equip learners with the knowledge, skills, and attitudes necessary for understanding and addressing environmental issues that affect society (Kaiser et al., 2008).

Problem Statement

The importance of changing society's behaviour towards the environment cannot be overstated, particularly given the pressing environmental challenges that we are today. To accomplish this goal, we require appropriate tools at our disposal, and one of the most important tools that allows reaching out to all categories of individuals is education.

Designing an effective educational program requires a meticulous examination and analysis of previous programs implemented. This approach enables us to identify successful initiatives and areas for improvement (Peters et al., 2015; Webster & Watson

2002). By building on the successes of previous initiatives and learning from their shortcomings, we can create more effective and impactful educational programs (Snyder, 2019), especially when dealing with topics that have a global relevance, such as insect conservation. With the right tools and strategies, we can work towards changing societal attitudes and behaviours towards the environment, which is critical in the face of the ongoing environmental challenges we face.

In order to design successful environmental education programs in the future, the aim of this study is to identify key characteristics associated with effective programs. To achieve this, we conducted a scoping review of studies that evaluated environmental education programs, specifically those targeting the enhancement of students' awareness of insects and their significance in the ecosystem. Our focus was on analysing the effects of intervention programs and the key program characteristics that contributed to their efficiency.

2. Method

Scoping studies can play a crucial role in providing an overview and critical analysis of the existing evidence. This category of studies examines the extent, range, and nature of research activity, clarifies concepts, draws conclusions, and identifies gaps in the existing literature. Researchers such as Arksey and O'Malley (2005), Davis et al. (2009), and Levac et al. (2010) have emphasized the importance of scoping studies in identifying and analyzing the formulated research questions, methods, and findings of existing studies, ultimately leading to a better understanding of the research landscape and informing future research directions.

The approach taken in this study to conduct a scoping review was based on the five-stage framework developed by Arksey and O'Malley (2005). The framework provides a systematic and transparent process for mapping a research area (Arksey & O'Malley, 2005). The five stages of the framework are: (1) identifying the initial research questions; (2) identifying relevant studies; (3) study selection; (4) charting the data and (5) collating, summarising, and reporting the results.

Stage 1: Identifying the Research Questions

The aim of this review was to identify and analyse environmental programs that target increasing awareness of and changing attitudes towards the decline of insects in order to shape pro-environmental behaviour. To achieve this, the scoping review was guided by the following research questions:

1. What are the objectives of environmental educational programs (EEP) focused on insect conservation?

2. What is the optimal duration of an EEP to achieve the objectives associated with insect conservation, including developing pro-environmental behaviour, changing attitudes towards insects, and increasing knowledge about insects and their decline?

3. What kind of population was targeted by the intervention programs, and by whom were the programs delivered?

4.What variables were used to evaluate the impact of these programs on participants, and what assessment tools were commonly employed?

5.Which groups of insects were targeted in these programs, and what specific activities were implemented to achieve the objectives?

6. What types of training methods were most frequently used in EEP interventions?

7. What were the recorded effects of the EEP's implementation?

Stage 2: Identifying relevant studies

Educational programs focused on insect conservation can be developed and implemented by researchers from various fields, including education or biology, i.e. the fiedl of entomology. Therefore, to identify studies conducted by researchers from both categories, we established two different sets of key search words. These search terms were determined by analysing some relevant studies previously identified. We included articles written by both entomologists and researchers/ practitioners from the education field in order to comprehensively capture relevant research in the field of insect conservation.

In the initial stage of the search method, we identified the following sets of keywords: "insects" AND "environmental education" AND "educational programs" (to identify studies from the education field) (Fig. 1), and "entomology" AND "outreach" AND "environmental education" (to capture studies related to entomology and outreach in environmental education) (Fig. 2). In our analysis, we included peer-reviewed studies published in English between 2000 and 2022 that evaluated the impact of educational programs aimed at increasing awareness about insect conservation among students from pre-university education. We used the Google Scholar electronic database with advanced search functions and saved relevant studies in “My library”. Figure 1 and Figure 2 summarize the screening procedure we followed, applying the aforementioned inclusion and exclusion criteria.

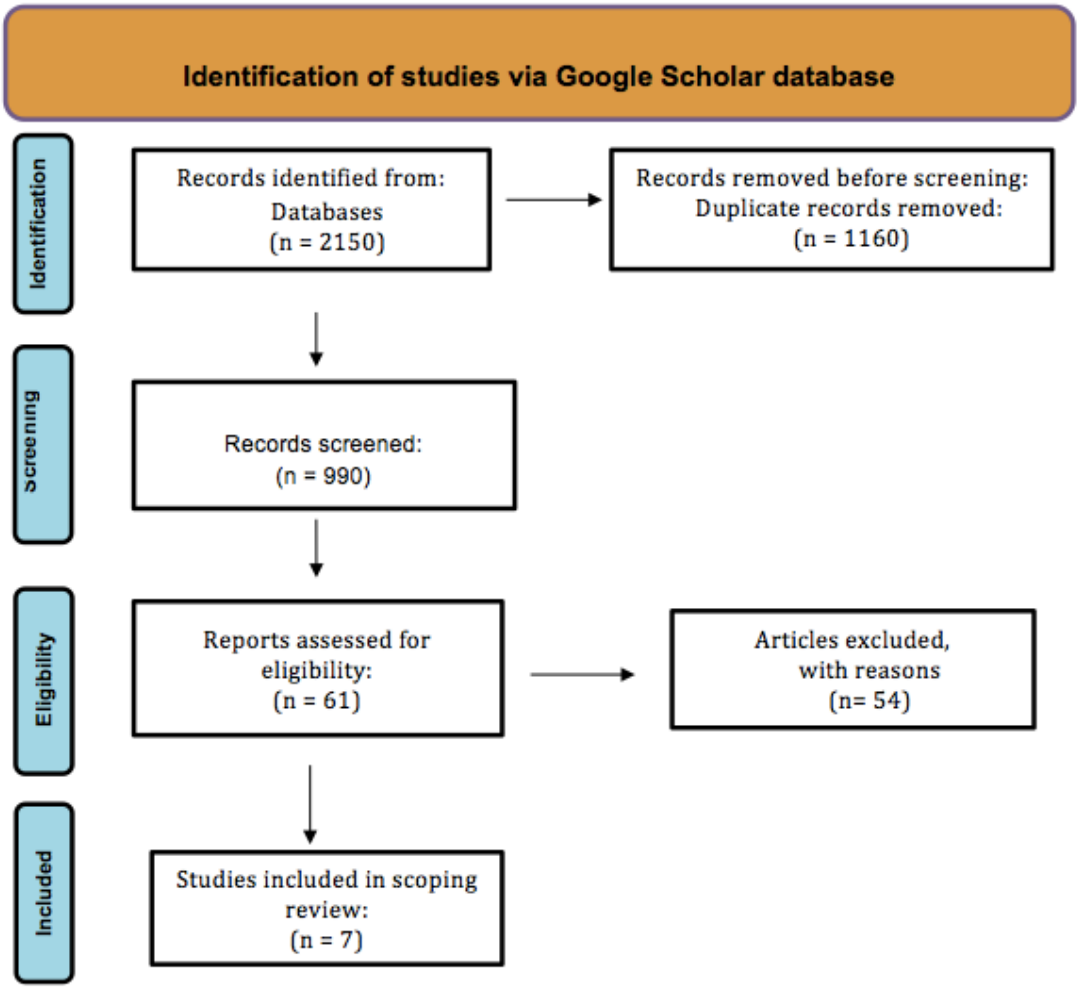


Figure 1. *PRISMA flow diagram (adapted from Moher et al., 2009) for the inclusion of articles relevant to the field of education (using the key search words: "insects" AND "environmental education" AND "educational programs").*

Stage 3: Study selection

During the study selection process, we noticed that although the Google Scholar database registers all available versions of an article, it displays only one version after a search. However, it does offer the option to view other versions if desired, which facilitated our screening process.

In the first search using the keywords "insects," "environmental education," and "educational programs," we initially found a number of 2150 articles. After eliminating duplicates and excluding conference proceedings, books, book chapters, and articles that didn't fit our topic, a number of 61 potentially relevant studies were included in the next step of the analysis. These studies were read in full and evaluated for suitability, resulting in only 7 studies that met all the inclusion criteria.

In the second search using the keywords "entomology," "outreach," and "environmental education," we found 7500 articles, but only 997 were unique entries after removing duplicates. We followed the same steps as in the first search to identify relevant studies, resulting in 140 potential articles after the initial screening, and ultimately identifying two relevant studies.

After completing the entire process, we have identified a number of 9 papers that are relevant to our research and that met all the inclusion criteria.

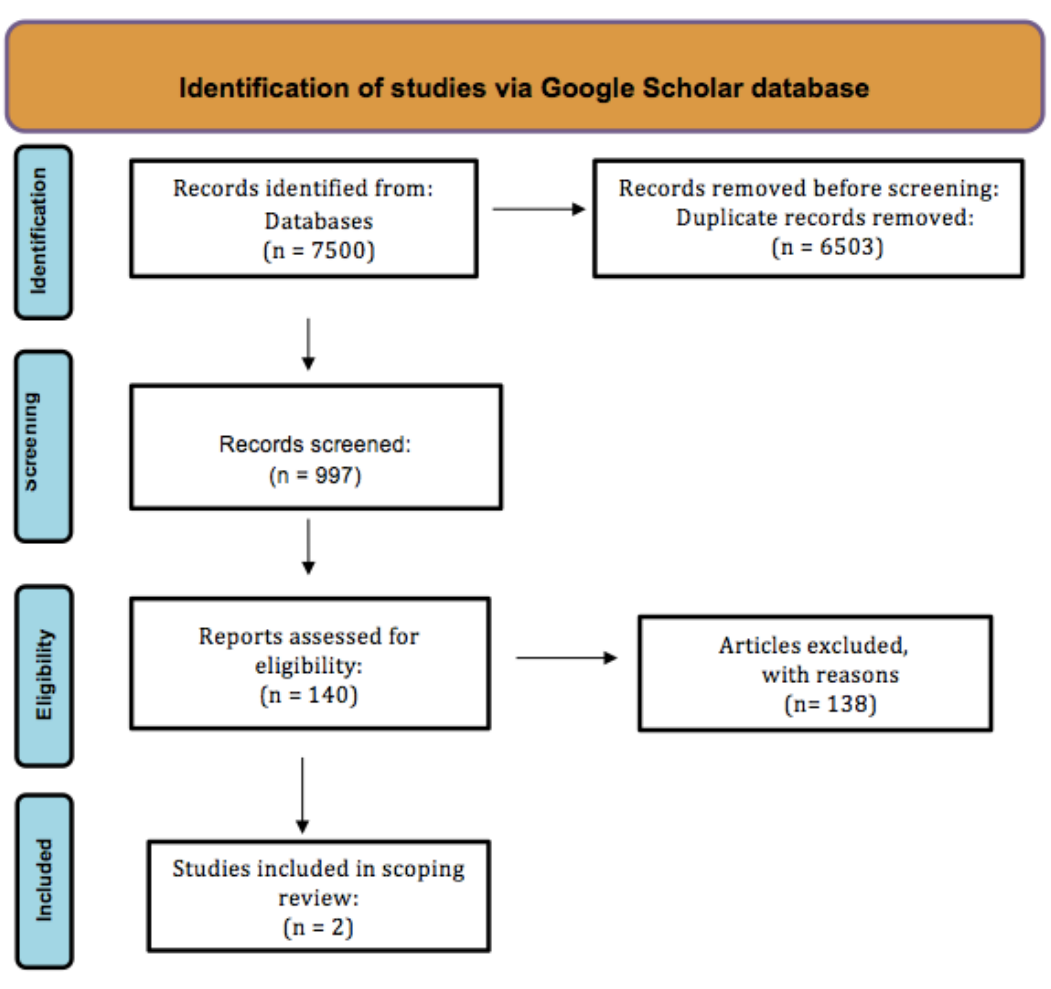


Figure 2. *PRISMA Flow Diagram (Adapted from Moher et al., 2009) for the inclusion of articles relevant to entomology and environmental education outreach (using the key search words: "entomology" AND "outreach" AND "environmental education")*

Stage 4: Charting the data

We charted the data by extracting the following information from the 9 studies: author, year of publication, aim and objectives of the study, details of the target group (including age and number of participants), implementation period of the program or duration of the intervention, evaluation of the impact of the educational program (including variables

and tools used), structure of the program, type of didactic training / pedagogical method, and the outcomes /effects recorded after the intervention. The key characteristics identified in the EPP are presented in Table 1, while data related to EPP impact evaluation, variables, measurement tools, and recorded effects are presented in Table 2.

Stage 5: Collating, summarising and reporting the results

Initially, a narrative synthesis was conducted to provide a fundamental numerical analysis of the studies' extent, methods, and distribution included in this review. Subsequently, a critical analysis of these articles was performed to identify key characteristics associated with effective environmental educational programs. The results of this analysis are presented in the "Findings" and "Conclusion" sections.

Table 1. *Synthesized data on key characteristics from reviewed studies (N=9; C = control, E = experimental)*

Authors & year	The aim and objectives	Program length	Target group	Training method	Insect species	Program content
Fisher-Maltese 2016	To measure changes in environmental attitudes as a result of a school garden experience.	11lessons in 4 weeks	66 Second-graders students	Garden-based science curriculum/ classroom-based action hands-on activities	Different species of insects	Classroom and garden insect lessons were conducted daily during the curriculum, facilitated by a support teacher, and co-taught in the school garden. The lessons centred on week-long themes such as anatomy, life cycles, helpful and harmful insects, butterfly, and larva identification, and designing a butterfly garden.
Schönfelder & Bogner 2017	Increasing individual willingness to protect honeybees as crucial pollinators evaluating two approaches: 1. encountering living animals while learning2. seeing animals via eLearning	There were four modules, each lasting around 135 minutes.	354 seventh and eighth graders	Student-centred learning Hands-on activities	Honeybee	The lessons were designed in the same way for both approaches (living bees at a local beehive versus an interactive online portal linked to a beehive), with the only difference being the way in which the students interacted with the bees. The 4 modules included 2 working stations: - one with analogue materials, - second one that involved direct experience with honeybees (at the beehive) or gathering and analysing original data (from an online hive)

Cho & Lee 2018	To change fear towards insects into affinity through an environmental educational program with hands-on activities. To increase students' connectedness to nature.	2 hours/ week for 3 weeks	104 students from third graders	Learning through hands-on activities	Honeybee	The program includes 3 lessons. The structure of each lesson consists of an introduction, which involves short lectures on important ecological aspects of honeybees. In the development section, students participate in different activities, i.e., harvesting honey from the hive. The lesson concludes with a discussion on various topics, including the life of a honeybee colony, and so on.
Weeks & Oseto 2018	One research objectives was to assess whether students exhibit a higher interest in environmental and entomological topics and issues when taught by an entomologist, by teachers trained by an entomologist, or by teachers with no entomological training.	Four lessons	15 teachers 28 to 57 years old 518 students from fifth grade (9 to 12 years old)	Lectures hands-on activities	Arthropods, including bees beetles, ladybugs, butterflies, mealworms	The research team created four lessons focused on insects and ecosystems, which utilized live arthropods to provide a hands-on learning experience. The lessons explored the basics of ecosystems, insect characteristics, and their roles in ecosystem health. The program was delivered through three methods: by an entomologist, a teacher trained by an entomologist, or a teacher who completed an online training program without direct interaction with an entomologist.
Healy, K. 2019	The goal was to actively involve and educate students about various fields of entomology, such as forensic, agricultural, and medical/ veterinary entomology.	45-60 min	50 high-school students	Game-based pedagogy escape-room-based activity		In a single hour, the students were able to explore various aspects of entomology, such as forensic entomology, post-mortem intervals, rice insect pests, and dichotomous keys. They also learned about the different ways that insects can cause harm to humans and animals and worked together to apply problem-solving strategies towards their objective.
Sieg & Dreesmann 2021	To increase willingness for pro-environmental behaviour intentions towards bumblebees. To implement bumblebees as a flagship species in biology classes;	3-5 weeks (during biology classes)	188 students from five to seven grades	Learning through hands-on activities	Bumblebee	The activities were divided into two units. Unit 1 included a theoretical component with information on the ecological importance of pollinators, the biological cycle and body language of bumblebees. The practical component involved hands-on activities such as handling bumblebees and recognizing their behaviours. Unit 2 focused on ecology, neurobiology, and ethology with a theoretical component covering the decline of insects, and a practical component involving experiments with bumblebee colonies to determine their diversity and density in different habitats, such as pheromonal communication.
Markee et al. 2021	The program named Frass in the Class aims to captivate children's attention and cultivate a love for nature by introducing live insect rearing in the classroom.	One month	70 students from five, seven, and nine grades	Hands-on activities	Painted lady butterfly	The program began with an introductory visit by researchers from the Florida Museum, who distributed butterfly larvae and materials for their growth and gave a presentation about insects. Virtual meetings were held every two weeks for students to discuss their progress and challenges with the researchers.

						At the end of the project, the adult butterflies were released during a short trip.
Asli et al. 2022	The aim of the study was to investigate how learning science through project-based teaching strategies affects students' perceptions of the climate in the scientific classroom	The program consisted of six 45-minute lessons and one 90-min lesson	28 students as C group 32 students as E group All students were in eight grades.	project-based teaching strategies	bees	The program consisted of six study units, with the initial units focused on testing and introducing the theme of bee biodiversity and decline. In the experimental group, students were divided into smaller groups and assigned a project to develop throughout the remaining lessons. They had access to a laboratory with computers and participated in online sessions with an expert, followed by a discussion session. Before presenting their projects, the experimental group conducted direct observations of bees and their habitats during a field trip. In the final lesson, the experimental group presented their projects to the rest of the class.
Christ et al. 2022	To develop among students a positive attitude towards, as well as a comprehensive knowledge about, wild bee.	The project was implemented from April to July, with the actual activities integrated into biology classes. An exact number of hours is not specified.	437 students from five to seven grades	learning through hands-on activities lectures	bumblebee	The program includes 2 learning units: a basic unit, where students receive information about the importance of pollinators and biodiversity, as well as the morphology and biology of bumblebees. In the second learning unit, called Citizen Science, students are involved in activities to monitor and identify the species of wild bees/bumblebees present in the schoolyard

Table 2. *Extracted data on the evaluation of EPP impact in the reviewed studies (N=9)*

Authors & year	Variables	Instruments used to evaluate the impact of the program	Implementation effects
Fisher-Maltese 2016	Science content knowledge Student attitudes toward the environment and insects	To identify improvements in information and changes in attitudes towards insects, a questionnaire was administered both before and after the intervention. In addition, the author conducted semi-structured interviews and recorded class discussions.	The results of the quantitative survey data did not show any statistically significant changes in attitudes in this study. However, data collected from pre/post-tests, interviews, and student conversations indicated a positive shift in students' attitudes towards a more empathetic view of nature. These findings suggest that the program may have helped prepare students to become environmental stewards.

Schönfelder & Bogner 2017	Specific aspects of attitudes towards bees as: 1. Interest 2. the perceived danger 3. the willingness to protect bees Situational learning emotions: 1. situational interest 2. well-being 3. boredom	A semantic differential on the perception of bees with eight bipolar items. The situational emotion questionnaire proposed by Randler et al. (2011) was used to measure the situational learning emotions. This instrument is based on a 5-point Likert scale.	The intervention had a positive impact on students' interest in bees and decreased their perception of danger associated with bees in the short and long term. The willingness to protect bees also improved, but the effect decreased from medium to small over time. Comparing live animal and digital tools interventions, the only significant difference was observed in the short-term decrease in perceived danger, with direct experiences with bees leading to a greater decrease. Students who had direct contact with bees also had significantly higher well-being and lower boredom compared to online participants.
Cho & Lee 2018	Connectedness to nature	Connectedness to nature was measured using 2 scales: Schultz's INS scale (2002) and CNS by Mayer and Frantz (2004). The first scale was modified from the Inclusion of Others in Self Scale, which is based on self-report. The participants had to choose a single graphic element that best represented the relationship between them and nature, using 7 pairs of circles with different degrees of overlap. The CNS (Connectedness to Nature Scale) measures the degree to which individuals feel connected to nature. It consists of 14 items that are rated on a five-point Likert scale (1-5). The aim is to capture the "we-ness" of individuals' experiences with nature	There was a significant increase in connectedness between the pre-test and post-test as measured by the INS scale, with a medium effect size. This effect was also maintained in the retention test. In contrast, a comparison of the CNS scale scores from the pre-test and post-test revealed a large effect size, which decreased to a medium effect size after three weeks.
Weeks & Oseto 2018	Students' intrinsic motivation Teacher self-efficacy	To determine the impact of the program towards students' intrinsic motivation was used a multi-scaled instrument named Intrinsic Motivation Inventory (IMI): 4 of seven subscales: Interest/Enjoyment, Effort/Importance, Value/Usefulness. Pressure/Tension 27 questions answered using a 7-point Likert scale. Teacher self-efficacy was evaluated using The Teachers' Sense of Efficacy Scale developed by Tschannen-Moran and Woolfolk Hoy, 2001, which consists of 24 questions on a 9-point Likert scale: the sub-scales are: Efficacy in Student Engagement (ESE), Efficacy in Instructional Strategies (EIS), and Efficacy in Classroom Management (ECM).	Students' intrinsic motivation Overall, students' intrinsic motivation towards the environment and entomology increased with each completed lesson. However, when comparing the three outreach delivery methods, there were no significant differences in intrinsic motivation. Still, students in the Online curriculum treatment found the lessons to be more interesting and enjoyable compared to students in the other two treatments. Additionally, when comparing the pressure and tension among the three treatments, students in the Online curriculum treatment reported higher levels than students in the other two treatments.
Healy, K. 2019	Students' subjective experience during the workshop	The students' experiences were evaluated using a 5-point Likert scale questionnaire consisting of 5 statements ranging from strongly disagree (1) to strongly agree (5).	The results indicate that the exercise was well-received by high school students and they found it informative.

Sieg & Dreesmann 2021	1. Pro-bumblebee behaviour intentions 2. Knowledge about bumblebees 3. insects decline 4. Attitude 5. Interest 6. Fear 7. Learning	To evaluate pro-bumblebee intentional behaviour, a scale containing 19 items was used, with a five-tier Likert scale ranging from 'agree' to 'do not agree'. The evaluation of knowledge about bumblebees and the decline of insects was carried out through closed questions, but there were also some open-ended questions related to the causes and consequences associated with the decline of insects. Attitudes towards bumblebees were measured using a five-tier Likert scale. Learning enjoyment was also measured through a five-tier Likert scale, ranging from 1 (lowest joy) to 5 (highest joy)	Overall, there was a significant increase in pro-environmental behaviour intentions with a medium effect size. No significant difference between the pre-test and follow-up test. In the pre- and post-test, there was a medium effect size correlation between knowledge about bumblebees and pro-environmental behaviour intentions. No significant correlation between the pre- and follow-up test. There was a correlation between knowledge about the decline of insects and pro-environmental behaviour intentions. Strong correlation between attitudes and pro-environmental behaviour.
Markee et al. 2021	Learners' perspectives and their experiences during the program	The students' experience was evaluated in an informal manner by asking them questions related to their learning, perception of insects, and the importance of insects. To assess the learners' perception, eight students were interviewed.	After the program, some students who did not like butterflies before changed their opinion about them. Others gained a better understanding of the role of butterflies in the ecosystem, and some even expressed interest in participating in similar programs or volunteer activities at the museum.
Asli et al. 2022	Classroom climate	A mixed-methods approach was employed to evaluate the classroom climate and student learning experience. A quantitative method was used to assess the classroom climate using a questionnaire with 35 statements and a 5-point Likert scale, which were divided into 7 factors: Cohesion of Students Teacher Support Involvement Collaboration Fairness Personal Relevance Material Environment General Learning Atmosphere To evaluate the students' learning experience, a structured interview was conducted (about the topic studied and the study method). Questionnaire and interview were administered pre- and post-intervention.	The project-based learning had a highly positive impact on the learning atmosphere: the learning atmosphere was found to be more positive in all dimensions. Students in the experimental group demonstrated a significant improvement in the learning atmosphere compared to those in the control group.
Christ et al. 2022	1. Knowledge about bumblebees, pollination, biodiversity, and insect decline 2. Attitude 3. Fear 4. Learning Enjoyment 5. pro-environmental-behaviour intentions	To evaluate students' knowledge of the topic, 16 closed questions were designed: 9 questions were about bumblebees, and 7 were about biodiversity, pollination, and the decline of insects. Attitudes towards bumblebees were measured using a five-tier Likert scale proposed by Sieg et al. Learning enjoyment was also measured through a five-tier Likert scale, ranging from 1 (lowest joy) to 5 (highest joy).	A significant increase in students' knowledge. A change in attitude among female students; no significant difference between the pre-test and post-test among male students. No significant change in the intention to act in an environmentally friendly manner across all evaluated items. A significant change for students' motivation to become active members.

3. Findings

This scoping review has revealed that between 2000 and 2022, only 9 articles met the inclusion criteria. These articles were published between 2016 and 2022. The findings according to the research questions are presented below.

3.1. What are the objectives of environmental programs focused on insect conservation?

As indicated in table 1, three of the studies aimed to improve students' attitudes towards insects by increasing their knowledge and direct experiences (Christ et al., 2022; Fisher-Maltese, 2016; Cho & Lee, 2018). The other two studies focused on developing a pro-environment and pro-insect behaviour, also by improving knowledge and direct experiences (Schönfelder & Bogner, 2018; Sieg and Dreesmann, 2021). The remaining studies aimed to increase students' interest in entomology (Weeks & Osero, 2018, Aslli et al., 2022, Healy, 2019, Markee at al., 2021). Additionally, one study aimed to investigate whether project-based learning could improve classroom climate and influence students' motivation to learn about bees (Aslli et al., 2022).

The studies conducted by entomologists or biologists primarily aimed to develop knowledge about insects and their role in the ecosystem, as well as to increase students' interest in entomology (Fisher-Maltese, 2016, Weeks & Osero, 2018, Markee at al., 2021). On the other hand, our analysis indicates that the studies conducted by researchers and practitioners in the field of education focused more on attitudes and behaviour, which are important aspects in the learning process (Schönfelder & Bogner, 2018, Christ et al., 2022, Sieg and Dreesmann, 2021, Cho and Lee, 2018, Aslli et al., 2022, Healy, 2019).

3.2. What is the optimal duration of an EEP to achieve the objectives associated with insect conservation (pro-environmental behaviour, attitudes towards insects, and knowledge about insects and their decline)?

Regarding the duration of the programs/interventions, the results varied from one hour (Healy, 2019) to 4 weeks (Fisher-Maltese, 2016, Sieg and Dreesmann, 2021, Markee at al., 2021), and in some studies, the actual time intended for the activities with the students was not clearly specified (Christ et al., 2022). The programs that lasted between 3 and 4 weeks were implemented during biology classes, so the total number of hours varied between 4 and 10-11 hours.

3.3. What kind of population was targeted by the intervention programs, and by whom were they delivered?

The intervention programs in the majority of the studies were aimed at primary and secondary school students (Schönfelder & Bogner, 2018; Fisher-Maltese, 2016; Christ et

al., 2022, Sieg and Dreesmann, 2021; Cho and Lee, 2018, Weeks & Osero, 2018, Markee at al., 2021). One of the studies targeted high school students (Healy, 2019), while another study had both fifth-grade students and teachers as the target group (Aslli et al., 2022).

Four out of the nine studies relied on teachers to deliver the EEP content (Christ et al., 2022, Sieg and Dreesmann, 2021, Aslli et al., 2022, Healy, 2019), who had been trained in advance by an expert. Two studies had the researcher deliver the program content (Schönfelder & Bogner, 2018, Cho and Lee, 2018), while in the remaining studies, the teacher received assistance from a researcher (Fisher-Maltese, 2016, Markee at al., 2021). In one of the studies (Weeks & Osero, 2018), all three ways of content delivery were implemented, and the outcomes were further compared to evaluate which one was more effective in achieving the program's objectives.

3.4. What types of training methods were most frequently used in environmental education programs?

Most of the studies used hands-on activities to achieve their objectives, such as improving attitudes towards insects, increasing interest in learning more about them, and generating pro-environmental behaviour (Table 1). Living animals were frequently used in almost all the programs, allowing children to interact with them directly and create memorable experiences. In addition to hands-on activities, some of the analysed studies also utilized project-based teaching strategies (Aslli et al., 2022) and game-based pedagogy, such as escape-room-based activities (Healy, 2019).

While hands-on activities are commonly used for primary and lower secondary education students, as they help children explore the surrounding world through play, teaching methods for 8th grade and high school students must be more cognitively demanding. These students are at a more advanced stage of cognitive development and require more sophisticated strategies that can challenge their critical thinking and problem-solving skills.

3.5. Which groups of insects were targeted in the EEP interventions, and what specific activities were implemented to achieve the objectives?

In this study, honeybees and bumblebees were the most used insects (Schönfelder & Bogner, 2018; Fisher-Maltese, 2016; Christ et al., 2022, Sieg and Dreesmann, 2021; Cho and Lee, 2018, Weeks & Osero, 2018, Aslli et al., 2022). They were chosen because they are two important pollinator species that play a critical role in maintaining ecosystem biodiversity. In addition to honeybees and bumblebees, three of the analysed studies also used butterflies (Fisher-Maltese, 2016, Weeks & Osero, 2018, Markee at al., 2021). Butterflies are part of the charismatic insect group, which includes insects that are adored by the public for their beauty, uniqueness, and fascinating life cycle.

Most of the activities included in the educational programs analysed in this study fall under the category of informal learning activities (Table 1). Although most of the lessons had a formal component, where students were introduced to the topic, they were followed by hands-on activities, where students interacted with live insects or conducted direct observations.

In one study (Aslli et al., 2022), the teacher designed the lesson using project-based teaching strategies, which stimulated teamwork, research, and communication skills among students.

3.6. What variables were used to evaluate the impact of these programs on participants, and what assessment tools were commonly employed?

Five of the analysed studies measured variables related to attitudes towards insects, intentions for pro-environmental behaviour, knowledge acquisition, and interest in studying insects. The other four studies focused on students' experiences during the program and measured variables such as intrinsic motivation, classroom climate, learner perspectives, and overall program experiences. In one study, teacher self-efficacy was also included as a variable, in addition to students' intrinsic motivation. Finally, one study evaluated attitudes towards insects in the context of connectedness to nature.

As indicated in Table 1, the assessment tools used in the EEP interventions were various, corresponding to the following aspects: attitudes, situational emotions, knowledge and behaviors. Hence, the tools were: questionnaires (most of them based on Likert-scale items) on intrinsic motivation, on teaching efficacy, on situational emotions, semantic differentials, on level of interest and engagement, as well as direct observations of students being involved in several activities. Some of the questionnaires were standard tools already existing in the literature, e.g., Connectedness to Nature Scale (Cho and Lee, 2018), while others were created by the authors, e.g. semi-structured interviews. The experimental approach was either quantitative, qualitative (e.g. content analysis of transcripts of recorded materials) or combined (mixed research method; Fisher-Maltese, 2016).

3.7. What were the recorded effects of the program's implementation?

All studies included in our scoping review reported positive effects after implementing the EEP. Specifically, studies measuring interest in insects found significant improvements both in the short and long term, and studies noted an overall positive shift in attitudes towards insects.

Regarding the perception of danger, in one study (Schönfelder and Bogner, 2018), the authors observed a significant improvement among students who had direct interaction with bees, as opposed to those who only experienced the program virtually.

However, no significant differences were recorded between the two approaches (living bees versus digital tools) in other dimensions evaluated.

Some studies reported either no significant difference in pro-environmental behaviour across the three evaluated time points (pre-test, post-test, and retention test), or a medium effect size immediately after the intervention that decreased considerably by the retention test.

The study conducted by Fisher-Maltese in 2016 utilized a mixed-methods approach, incorporating both quantitative and qualitative methods. Alongside the collection of quantitative data, the study also involved the use of interviews and audio recordings during the educational program to gather qualitative data. The quantitative results did not indicate any significant changes in attitudes towards insects. However, the qualitative methods revealed an improvement in attitudes and perceptions towards insects. For instance, one student who expressed discomfort around insects at the beginning of the program no longer showed any fear associated with insects and actively participated in all proposed activities, including capturing insects and observing them in their natural habitat.

4. Conclusion

This study provides an analysis of intervention programs aimed at improving students' attitudes towards insects by increasing their knowledge, regulating their emotions towards insects and providing direct experiences. The study summarizes the effects of environmental educational programs as reported by evaluation studies. Additionally, the study identifies several key aspects related to program design and implementation, such as aims, length, and training methods that may contribute to program effectiveness.

This analysis suggests that school-based emotional development interventions, such as short environmental educational programs, can be effective in improving both students' level of interest in studying insects and their attitudes towards them. However, the impact on pro-environmental behaviour appears to be more complex. While the effects reported by the analysed studies show that behaviour improves during and immediately after the intervention, it appears to fade after a period (Fisher-Maltese, 2016; Schönfelder & Bogner, 2017). Further research is needed to determine how to maintain the positive changes in pro-environmental behaviour over time.

An essential element in achieving conservation objectives for insects is the delivery of information through effective methods. Hands-on activities have been widely used, especially for primary and secondary school children, as they are efficient in promoting learning (Holstermann & Bögeholz, 2010). However, several authors indicate that methods must be tailored to suit the age group of the students. Therefore, for high school students, more cognitively demanding methods, such as project-based teaching strategies (Aslli et al., 2022) and game-based pedagogy like escape-room-based activities (Healy, 2019), would be more appropriate.

To develop an effective educational program aimed at promoting insect conservation, it is crucial to foster an interdisciplinary climate of collaboration between biologists/ entomologists and teachers. Entomologists can bring specialized knowledge of insects and their ecological roles, as well as experience in handling live insects, while teachers can offer expertise in effective teaching methods and classroom management (Weeks & Osero, 2018). The collaboration and integration of these different skill sets are essential to achieve the proposed objectives of the program.

The findings of this study provide valuable insights into the effectiveness and usefulness of environmental educational programs. Based on the analysis, several features of effective interventions were identified. These results can be used to develop intervention guidelines for improving attitudes towards insects and promoting pro-environmental behavior. However, it is important to note that the present analysis was limited by the exclusion of studies with restricted full text access, which may have resulted in the omission of relevant evaluation studies.

References

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International journal of social research methodology*, *8*(1), 19-32.

Asli, S., Abu-Alhiga, R., Algmal, S., & Hugerat, M. (2022). Teaching and Learning about Bee Extinction through Project-Based Learning (PBL): Its Impact on the Classroom Climate (CL) among Eighth Grader Students. *Sustainability*, 14(12), 7477.

Balmford, A., Bradbury, R. B., Bauer, J. M., Broad, S., Burgess, G., Burgman, M., ... & Nielsen, K. S. (2021). Making more effective use of human behavioural science in conservation interventions. *Biological Conservation*, *261*, 109256.

Bellon, A. M. (2019). Does animal charisma influence conservation funding for vertebrate species under the US Endangered Species Act?. *Environmental Economics and Policy Studies*, *21*(3), 399-411.

Bjerke, T., & Østdahl, T. (2004). Animal-related attitudes and activities in an urban population. *Anthrozoös*, 17(2), 109-129.

Butchart, S. H., Walpole, M., Collen, B., Van Strien, A., Scharlemann, J. P., Almond, R. E., ... & Watson, R. (2010). Global biodiversity: indicators of recent declines. *Science*, 328(5982), 1164-1168.

Cardoso, P., Erwin, T. L., Borges, P. A., & New, T. R. (2011). The seven impediments in invertebrate conservation and how to overcome them. *Biological conservation*, 144(11), 2647-2655.

Castillo-Huitrón, N. M., Naranjo, E. J., Santos-Fita, D., & Estrada-Lugo, E. (2020). The importance of human emotions for wildlife conservation. *Frontiers in Psychology*, 11, 1277.

Ceballos, G., Ehrlich, P. R., Barnosky, A. D., García, A., Pringle, R. M., & Palmer, T. M. (2015). Accelerated modern human–induced species losses: Entering the sixth mass extinction. *Science advances*, 1(5), e1400253.

Chawla, L. (2007). Childhood experiences associated with care for the natural world: A theoretical framework for empirical results. *Children Youth and Environments*, 17(4), 144-170.

Cho, Y., & Lee, D. (2018). 'Love honey, hate honey bees': reviving biophilia of elementary school students through environmental education program. *Environmental Education Research*, 24(3), 445-460.

Christ, L., Hahn, M., Sieg, A. K., & Dreesmann, D. C. (2022). Be (e) Engaged! How Students Benefit from an Educational Citizen Science Project on Biodiversity in Their Biology Classes. *Sustainability*, 14(21), 14524.

Colléony, A., Clayton, S., Couvet, D., Saint Jalme, M., & Prévot, A. C. (2017). Human preferences for species conservation: Animal charisma trumps endangered status. *Biological conservation*, 206, 263-269

Davis, K., Drey, N., & Gould, D. (2009). What are scoping studies? A review of the nursing literature. *International journal of nursing studies*, *46*(10), 1386-1400.

Fisher-Maltese, C. (2016). " We Won't Hurt You Butterfly!" Second-Graders Become Environmental Stewards from Experiences in a School Garden. International *Journal of Early Childhood Environmental Education*, 4(1), 54-69.

Gelter, H. (2000). Friluftsliv: The Scandinavian philosophy of outdoor life. *Canadian Journal of Environmental Education (CJEE)*, 77-92.

Gralton, A., Sinclair, M., & Purnell, K. (2004). Changes in attitudes, beliefs and behaviour: A critical review of research into the impacts of environmental education initiatives. *Australian Journal of Environmental Education*, *20*(2), 41-52.

Hall, D. M., & Martins, D. J. (2020). Human dimensions of insect pollinator conservation. *Current opinion in insect science*, 38, 107-114.

Hallmann, C. A., Sorg, M., Jongejans, E., Siepel, H., Hofland, N., Schwan, H., ... & De Kroon, H. (2017). More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PloS one*, *12*(10), e0185809.

Healy, K. (2019). Using an escape-room-themed curriculum to engage and educate generation Z students about entomology. *American Entomologist*, 65(1), 24-28.

Holstermann, N., Grube, D., & Bögeholz, S. (2010). Hands-on activities and their influence on students' interest. *Research in science education*, 40, 743-757.

Johansson, M., Sjöström, M., Karlsson, J., & Brännlund, R. (2012). Is human fear affecting public willingness to pay for the management and conservation of large carnivores? *Society & Natural Resources*, 25(6), 610-620.

Kaiser, F. G., Roczen, N., & Bogner, F. X. (2008). Competence formation in environmental education: Advancing ecology-specific rather than general abilities. *Umweltpsychologie*, 12(2), 56-70.

Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and behavior*, *31*(2), 178-202.

Kellert, S. R. (1993). Values and perceptions of invertebrates. *Conservation biology*, 7(4), 845-855.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation science*, *5*, 1-9.

Lockwood, J. (2013). The infested mind: Why humans fear, loathe, and love insects. *Oxford University Press*.

Markee, A., Dansby, H., Messcher, R., Hernandez, E., Kawahara, A. Y., & Storer, C. G. (2021). Frass in the class: A model for fostering interest in the natural world through insect rearing in the classroom. *American Entomologist*, 67(3), 24-29.

Martín-López, B., Montes, C., & Benayas, J. (2007). The non-economic motives behind the willingness to pay for biodiversity conservation. *Biological conservation*, 139(1-2), 67-82.

Miller, J. R. (2005). Biodiversity conservation and the extinction of experience. *Trends in ecology & evolution*, 20(8), 430-434.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., The PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Medicine*, 6(7), e1000097. https://doi.org/10.1371/journal.pmed100009.

Naeem, S., Chazdon, R., Duffy, J. E., Prager, C., & Worm, B. (2016). Biodiversity and human well-being: an essential link for sustainable development. *Proceedings of the Royal Society B: Biological Sciences*, 283(1844), 20162091.

Orians, G. H. (2017). Human behavioral ecology: 140 years without Darwin is too long. In Evolutionary perspectives on environmental problems (pp. 259-280). *Routledge*

Orr, D. W. (1993). Love it or lose it: The coming biophilia revolution. *St. R. Kellert and EO Wilson (Eds.), The Biophilia Hypothesis, Washington (Island Press) 1993, pp. 414-440.*

Peters, M. D., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *JBI Evidence Implementation*, *13*(3), 141-146.

Prokop, P., & Randler, C. (2018). Biological predispositions and individual differences in human attitudes toward animals. In Ethnozoology (pp. 447-466). *Academic Press*.

Prokop, P., Usak, M. & Fančovičová, J. Health and the avoidance of macroparasites: a preliminary cross-cultural study. *J Ethol* 28, 345–351 (2010). https://doi.org/10.1007/s10164-009-0195-3

Pyle, R. M. (1993). The Thunder Tree: Lessons from a Secondhand Land. Houghton Mifflin.

Samways, M. J. (2015). Future-proofing insect diversity. *Current opinion in insect science*, 12, 71-78.

Schönfelder, M. L., & Bogner, F. X. (2018). How to sustainably increase students' willingness to protect pollinators. *Environmental Education Research*, 24(3), 461-473.

Shipley, N. J., & Bixler, R. D. (2017). Beautiful bugs, bothersome bugs, and FUN bugs: Examining human interactions with insects and other arthropods. *Anthrozoös*, *30*(3), 357-372.

Sieg, A. K., & Dreesmann, D. (2021). Promoting Pro-Environmental BEEhavior in School. Factors Leading to Eco-Friendly Student Action. *Sustainability*, 13(12), 6598.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, *104*, 333-339.

Soga, M., & Gaston, K. J. (2016). Extinction of experience: the loss of human–nature interactions. *Frontiers in Ecology and the Environment*, 14(2), 94-101.

Soga, M., Evans, M. J., Yamanoi, T., Fukano, Y., Tsuchiya, K., Koyanagi, T. F., & Kanai, T. (2020). How can we mitigate against increasing biophobia among children during the extinction of experience? *Biological conservation*, *242*, 108420.

Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS quarterly*, xiii-xxiii.

Weeks, F. J., & Oseto, C. Y. (2018). Interest in insects: the role of entomology in environmental education. *Insects*, 9(1), 26.

Wilson, E. O. (1984). Biophilia. Harvard University Press

Zhang, W., Goodale, E., & Chen, J. (2014). How contact with nature affects children's biophilia, biophobia and conservation attitude in China. *Biological Conservation*, 177, 109-116.

2

Systematic literature review on digital citizenship education for primary school students

Ştefana Opria•, Mariana Momanu••

Abstract

The trend toward the digitalization of all areas of human activity has had a significant impact on education. Today, more than ever, there is a lot of discussion about developing the students' specific skills to adapt to future changes. In this context, research investigating practices at the primary school level is constantly expanding, out of the desire for researchers to identify how specific digital citizenship content is implemented in the work of young learners. This study aims to systematically review the scholarly articles to examine primary school practices related to digital citizenship. Studies conducted on participants, students, and primary school teachers, were included in the analysis. The systematic review was also developed taking into account empirical studies that investigated practical applications in the field of digital citizenship. The results showed that the practices used in primary school focus on students' digital literacy and personal development through an interdisciplinary approach. The studies were theoretically grounded, focusing on only a few dimensions of digital citizenship. These results are the prerequisites for the realization of elementary education in line with the needs of young learners, taking into account the trend of digitalization in all areas of human activity.

Keywords: digital citizenship; education; primary school.

1. Introduction

Over the last twenty years, the importance of introducing digital citizenship content into the school curriculum has increased, especially as children spend considerable time in front of screens.

The virtualization of school and out-of-school environments is an invitation to all educational institutions to take up the challenges of engaging school children in cyberspace (Tadlaoui-Brahmi, Cuko & Alvarez, 2022). Thus, digital citizenship can be

• PhD student, "Alexandru Ioan Cuza" University of Iasi, Romania, stefana_opria@yahoo.com
•• Professor, "Alexandru Ioan Cuza" University of Iasi, Romania, momanu@uaic.ro

developed in primary school students not only in school but also in non-formal and informal settings (Gleason & von Gillern, 2018). Although schools' educational offerings do not usually provide digital citizenship education at different age levels, the measures that are required when such content is delivered are an argument for analysis (Alonso-Ferreiro et al., 2020). Research shows that the organization of educational experiences related to digital citizenship for young school-age students differs depending on the country of origin because each corner of the world has its specificities (Tadlaoui-Brahmi, Cuko & Alvarez, 2022). Empirical evidence also shows that there is an emphasis on developing technical skills and digital access at early school age (Ball & Skrzypek, 2019), with children also engaged in civic and social engagement activities (Gutierrez de Blume et al., 2016). Thus, digital citizenship becomes an umbrella concept under which educational programs for developing the digital competencies of students of primary school age and beyond are hidden. Ribble, Bailey, and Ross (2004, p. 7) state that digital citizenship is the "norms for appropriate, responsible about technology use" and James, Weinstein, and Mendoza (2021, p. 13) define this concept as "using technology responsibly to learn, create and participate. To better understand it is about digital and citizenship, the former lexeme shows a unique set of skills and dispositions in online contexts and the use of technology. The term citizenship refers to being a member and inhabitant of a community, while also taking into account the rights and responsibilities each person has towards the wider community and world."

The literature reflects a lack in the transmission of content, with primary school curricula showing a significant deficit in teaching philosophical knowledge or knowledge related to ethics in general (Tadlaoui-Brahmi, Cuko & Alvarez, 2022). This is why digital citizenship education, although usually connected only to a few school subjects, must be carried out by extending the links to subjects such as philosophy, ethics, or ecology. In this way, pupils are supported in developing critical thinking and resilience to the appropriate use of technology.

Concerning early childhood, empirical data are scarce, with most research focusing on schooling. The difficulty of collecting data at this age level and the need for time-consuming qualitative approaches may explain the reality reflected. Despite this, knowing that the topic of digital technology use is a topical one, including that addressed to young children, social media is the space where young children spend more and more time (Tomé, 2016). Efforts to introduce content specific to digital citizenship have led to researchers' interest in measuring the effects of these interventions in elementary education through studies. Given that most systematic reviews focus on research conducted on groups of adolescents or adults, this study brings an element of innovation by including in analysis only the investigations organized in elementary education.

2. Methodology

2.1. The methodology of systematic review

The study we propose is a systematic review that aims to analyze empirical evidence, according to eligibility criteria, that answers the research questions (Tadlaoui-Brahmia, Çukoa & Alvarez, 2022). We used relevant methods that were selected to minimize the bias, thus providing reliable findings from which conclusions can be drawn and decisions made (Green et al., 2015). Conducting a systematic review involves following a predefined procedure, described by Newmann and Gough (2020) who mention the following steps: formulation of research questions, selection of studies according to inclusion/exclusion criteria, coding strategy, in-depth analysis and synthesis, a structure that will be detailed in the following sections.

2.2. Research questions

To fully understand how we can provide digital citizenship education we have formulated the following research questions to which answers are sought: What goals do teachers set for digital citizenship education? Are there differences in handling the content related to digital citizenship according to the year of publication for the analyzed studies? Which defining aspects of digital citizenship is determined by the cultural background? What differences are considering the students' age in teaching digital citizenship education? How are learning experiences in primary education organized concerning the development of digital citizenship skills? As a result of these research questions, the study contributes to the operationalization of this theoretical concept, aiming at the organization of the systematic review.

2.3. Search procedures

The systematic review included articles published between 2010-2022 in peer-reviewed journals. We used the following databases: ERIC, JSTOR, Science Direct (Elsevier), Central Eastern European Online Library (CEEOL), and Directory of Open Access Journal (DOAJ). The keywords we used in the search for articles were: "digital citizenship", "education" and "elementary school".

2.4. Eligibility criteria

To answer the research questions, we used the following criteria related to digital citizenship:

a. Report on the practical implementation of digital citizenship content in the classroom.

b. Educational practices at the primary school level.

c. Languages of publication to be English and Romanian.

d. Year of publication to be after 2010.

The following types of studies have been excluded:

a. Theoretical studies.

b. Research carried out at secondary, high, and university levels.

c. Articles that are written in languages other than English and Romanian.

d. Research done earlier than 2010.

2.5. Search and screening process

During an initial search, we found 293 studies. After excluding duplicates, a total of 250 studies remained. After analysis of titles and abstracts we extracted 64; this process was carried out by two researchers. After reading all the articles, we excluded 25 from the analysis due to the treatment of the issue of digital citizenship strictly at a theoretical level. As a result, we included 39 studies in the review (**Figure 1**).

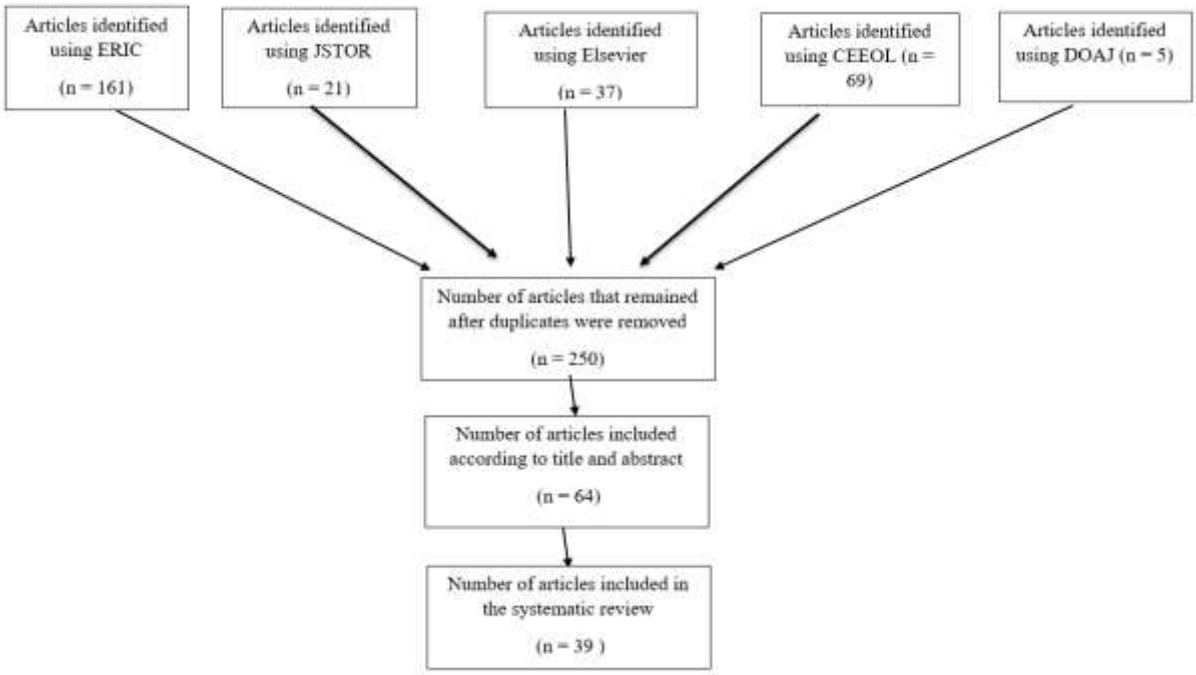


Figure 1. *Selection procedure for articles included in the systematic review*

2.6. Coding and data extraction

We followed the steps described by Newman and Gough (2020) for the systematic review: research question and conceptual framework, selection criteria and search strategy, study selection, and coding strategy. Due to the focus of this review on describing implementation practices, the quality assessment of each study is briefly highlighted. Therefore, the data assessment process has not been conducted. Finally, the results, discussion, and conclusions have been reported.

2.7. Agreement between researchers

We carried out from a dual perspective the scheme and coding, with two specialists involved in data collection and analysis. Thus, the steps we carried were as follows: in the first stage a single researcher named the categories based on theoretical models of digital citizenship; this phase was followed by the study of selected articles by the two researchers; lastly, the first researcher reviewed the double analysis to verify the coding categories and to formulate the research conclusions. We carried out this process considering the agreement between the specialists.

2.8. The importance of the theoretical model of digital citizenship in the coding process

The theoretical model developed by Ribble (2015) provided the guiding directions in selecting categories of educational interventions in the digital citizenship plan. The nine dimensions explained by Ribble show the necessary competencies that Internet users need to have for the favorable development of future society. The nine categories corresponding to the dimensions Ribble (2015) identified are digital access, digital etiquette, digital legislation, digital communication, digital literacy, digital commerce, digital rights and responsibilities, digital safety and security, and digital health and well-being (**Figure 2**).

Digital access is about distributing digital tools equally to all virtual users and digital commerce refers to the purchase of goods or services in the virtual environment. Digital communication is the electronic exchange of information and digital etiquette aims to develop a sense of citizenship and empathy when using digital devices. Digital literacy of online users refers to the development of skills to understand and use technology correctly. Digital health aims to ensure optimal physical and psychological health.

Figure 2. *Ribble's theoretical model of digital citizenship (2015)*

Digital justice aims to ensure that online activity is governed by rules and laws that are tailored to each problem in the digital world. Digital security is about security measures in digital contexts. The rights and responsibilities that users have online are freedoms they can enjoy in cyberspace, such as freedom of expression, participation in various activities, but also obligations to others (Ribble, 2015).

Figure 3. *The five components of DigComp 2.1 (Carretero et al., 2017)*

The second theoretical model on which the systematic review was built is the one developed by Carretero et al. (2017) entitled DigComp 2.1 which is well-known and implemented in the European space (**Figure 3**).

In this respect, five areas of digital competencies are defined as follows: information and digital literacy, which refers to the search, filtering, analysis, and evaluation of information and digital content; communication and collaboration, which aims at interaction, sharing, active citizenship, collaboration and communication through digital tools; digital content creation, which aims at developing, integrating and reconstructing digital content, i.e. programming; digital safety which is concerned with the protection of devices, personal data, personal well-being, health, and the environment; problem-solving which is the dimension aimed at technical problem-solving activities, identification of technological needs, creative use of digital technology, and identification of gaps in the development of digital competencies.

The two models of digital citizenship are the theoretical basis that guided the selection process for a conclusive systematic review that faithfully reflects the educational practices in the school. In this way, the quality of the approach initiated was ensured by connecting it to the current literature.

3. Results

In this section, we have made a foray into the literature on digital citizenship and the implementation of specific content in educational contexts. Starting from the questions launched at the beginning of the collection and analysis of the elaborated research we aimed at identifying specific educational practices of digital citizenship, taking into account the coding system developed on theoretical grounds. After preliminary analysis, we noticed that most of the studies dealing with this issue have participants as university students, future practitioners in the field of educational sciences, and to a certain extent, high school and secondary school students. Thus, we note that there are a small number of studies that include elementary school students to investigate educational practices specific to digital citizenship. The majority of studies involve participants from the perspective of identifying their perceptions of certain fundamental concepts specific to digital citizenship and less on the practical dimension. Therefore, for these reasons, we selected 39 studies for review to identify at a practical level how specific digital citizenship content is covered in primary school. Based on the information collected, we arrived at the statement of several dimensions, in line with the two theoretical models developed by Ribble (2015) and Carretero et al. (2017). We grouped the 39 studies according to the main categories, resulting in six dimensions given by information recurrence (**Figure 4**).

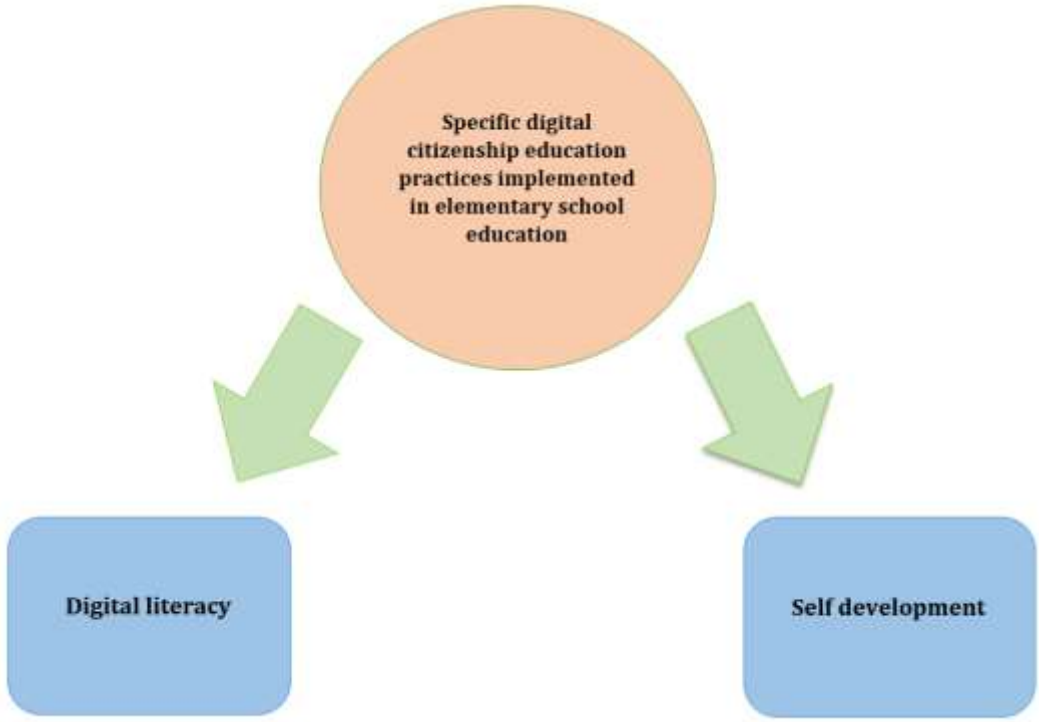


Figure 4. *Directions for implementing specific digital citizenship contents identified in the analyzed studies*

3.1. Digital citizenship-global perspectives on how to teach specific content

Most of the analyzed articles reflect the multidimensional perspective of digital citizenship, focusing in particular on digital literacy and the practical action of cyber-citizenship. Most studies focus on the development of digital competencies and facilitation of digital learning (e.g. Anderson, 2018; Rambouseka, Štípeka & Wildová, 2014; Gezer & Anilan, 2021; Vartiainen, Toivonen, Jormanainen, Kahila, Tedre & Valtonen, 2021), given that the participant groups are aged between 8 and 11. Rambouseka, Štípeka, and Vaňková (2016) wanted to carry out through their research approach a thorough analysis of the digital literacy level of young learners to make improvements in terms of the national curriculum, the instructional-educational process, and organizational aspects. All these contributions aimed to support pupils in developing the digital skills needed by the present and future society. On the other hand, Quadros-Flores, Ramos Gonçalves and Ramos (2022) initiated an approach where they wanted to explore the involvement of students in the creation of online educational content by activating previously acquired knowledge through collaborative learning in digital lessons. The results showed that the conscious and active participation of students in the process of creating online educational content stimulates the articulation of knowledge in an inclusive education for all children. This is achieved by activating prior knowledge, thus helping students to develop positively, both cognitively and emotionally (Quadros-

Flores, Ramos Gonçalves & Ramos, 2022). Gaps acquired in distance learning can be remedied by using digital tools as shown in a study by Ökördi and Molnár (2022). Their research focused on the development of mathematical skills of students with learning difficulties, i.e. exploring the options, benefits, and limitations of an online game-based intervention. The results showed that the use of digital media reduced the learning gaps accumulated during distance learning, without additional effort by the teacher, which is essential for the success of the proposed educational program (Ökördi & Molnár, 2022).

3.2. Teaching methods and learning tasks specific to digital citizenship

Following the systematic analysis of the literature articles exploring practices related to digital citizenship in elementary school students, we have noticed that there are two directions of implementation of specific content: one pragmatic, focused on the benefits of learning through online media and environments, and the other educational, with a profound impact on the personal development of young students through digital tools (**Table**)

Table

The systematisation of the analyzed studies, according to the digital citizenship education in elementary school

Digital literacy through interdisciplinarity		**Self-Development**	
Integrated subjects	Author and year of publication	Topics	Author and year of publication
DC and language skills	• Chiarelli, Szabo & Williams, 2015 • Rambouseka, Štípeka & Vaňková, 2016 • YamaÇ & Ulusoy, 2016 • Anderson, 2018 • Özhek & Girli, 2017 • Kloos, Sliemers, Cartwright, Mano & Stage, 2019 • Kim, Asher, Burkhauser, Mesite & Leyva, 2019 • Bratitsis & Mantellou, 2020 • Hazar, 2020 • Gezer & Anilan, 2021 • Sahin & Özenç, 2021 • Samosa, Vicente, Rapada, Javier & Lansangan, 2021 • Graça, Quadro-Flores & Ramos, 2022	DC and Metacognition	• Nieto-Márquez, Baldominos & Pérez-Nieto, 2020
		DC and Inclusive Education	• Hongngam, Donnaya Iniumpa & Kallaya Chanapai, 2022
		DC and Cognitive Competencies	• Davidsen & Christiansen, 2014 • Rambouseka, Štípeka & Wildová, 2015 • Jenson, Castell, Fraser, Muehrer, Ryerson McLaughlin-Jenkins, 2016 • Zafiropoulou & Darra, 2019 • Chen, Wang, Chen, Chen & Lin, 2020 • Dovigo, 2021 • Vartiainen, Toivonen, Iormanainen, Kahila, Tedre & Valtonen, 2021 • Kurniawati, Kartowagiran, Wuryandani, Retnawati & Herwin, 2022 • Quadros-Flores, Ramos Gonçalves & Ramos, 2022
DC and Mathematics and Sciences	• Kacprowski & Raimondi, 2014 • Lai, 2016 • Higgins, Crowford, Huscroft-D'Angelo, Horney, 2016 • Thangamani & Fu, 2019 • Kor, 2019 • Lozada-Yánez, La-Serna-Palomino & Molina-Granja, 2019 • Anderson-Pence, Tygret & Crocker, 2020 • Kurvinen, Kaila, Laakso & Salakoski, 2020 • Ökördi & Molnár, 2022	DC and Problem-Based Learning	• KAÇAN & KAÇAN, 2022
DC and Tehnological Education	• Saarinen, Seitamaa-Hakkarainen & Hakkarainen, 2016	DC and School Behaviuour	• Ejsing-Duun & Helle Marie Skovbjerg, 2016 • Karalar & Sidekli, 2017 • Azis & Ahmad, 2022
DC and Music	• Germeroth, Kelleman & Spartz, 2018		

The use of technology from a pragmatic perspective follows the need of young learners to be supported in the process of developing specific skills, but also to increase motivation for learning. The theorizations of digital citizenship underpinning these studies emphasize the need for the Internet user to be able to learn with online tools. The focus is on dimensions of the fundamental concepts such as digital communication, digital literacy mentioned by Ribble (2015), and communication and collaboration, i.e. digital content creation, mentioned by Carretero et al. (2017). Content specific to digital citizenship is approached from an interdisciplinary perspective, through elements specific to mathematics, science, language and communication, visual arts, and music. The teaching-learning methods that facilitate the development of digital citizenship skills are exercise, project-based learning, or problem-solving. Higgins, Crawford, Huscroft-D'Angelo, and Horney (2016) wanted to investigate through their study how digital tools can influence mathematical reasoning in a non-formal online course entitled "Math Learning Companion". Thus, primary school students in two private schools were assessed in terms of mathematical reasoning, both at the beginning moment and after the intervention. The results showed an overall change in mathematical reasoning during the intervention, requiring individualization of the proposed learning program (Higgins, Crawford, Huscroft-D'Angelo & Horney, 2016). The development of literacy skills through educational software packages was the topic of research by Şahin and Özenç (2021). Thus, through qualitative methods, they collected data on the usefulness of online educational materials for promoting and developing reading-writing skills. Based on the information collected, it was noted that educational software packages for students provide an advantage in differentiated teaching, thus minimizing differences between students, helping them to be more motivated, and allowing them to apply what they have learned, stimulating them multisensory (Şahin and Özenç, 2021). Unique research that aimed at exploring the benefits of digital portfolios in technology education was conducted by Saarinen, Seitamaa-Hakkarainen, and Hakkarainen (2016). They investigated the experiences that elementary school students have when using digital tools to make collections of activity products. Based on interviews conducted with third graders, they arrived at results that demonstrated the usefulness of iPads and Book Creator in making portfolios. The sooner they are used in educational practice, the more they become an integral part of a natural instructional-educational process. Their value in terms of organizing information, teacher-pupil relations, and assessing pupils' final products is obvious. This method and the digital tools used offer a balance between design presentation and the possibility of process evaluation. The students' experiences collected during the research are relevant and useful for improving educational practices (Saarinen, Seitamaa-Hakkarainen & Hakkarainen, 2016). One study focused on the development of reading skills through music and digital tools (Germeroth, Kelleman &

Spartz, 2018). Researchers measured the effectiveness of using a platform called “Lyrics to Learn” to support students in reading fluently with technology and music authoring.

The second perspective towards the personal development of learners through digital tools is reflected in several research studies included in the systematic review. Rambouseka, Štípeka, and Vaňková (2016) looked for identifying the specific content of digital literacy education promoted at the primary and secondary school levels. Thus, this investigation aimed to improve the curriculum, the instructional-educational process, and the elements of institutional management in the direction of digital literacy of primary and secondary school students. In the same direction, the research conducted by Chiarelli, Szabo, and Williams (2015) followed the dynamics of the school group by using a popular educational platform, namely "Class Dojo". It facilitates the realization of student class management by creating avatars, and virtual images of each child in the class. In this way, schoolchildren receive feedback in an online format, making them more motivated to improve their behavior and at the same time interact effectively within the group. The results of research on a group of primary school pupils showed that the use of the “Class Dojo” platform has positive effects on pupils' behavior and helps them to be more aware of their behavior. The use of this resource supported the students in orienting their behavior towards working efficiently in groups, but also during the reading moments organized in class (Chiarelli, Szabo & Williams, 2015).

In a study that focused on the effects of touchscreens on collaborative learning, Davidsen and Christiansen (2014) collected important data to measure this relationship. Based on the multimodal interaction of 8 to 9-year-olds, they concluded that children use hand movements to control access to the online environment, to construct and solve a problem, and to demonstrate or imitate behaviors. Another aspect highlighted in Davidsen and Christiansen's (2014) study concerns how young learners develop behaviors in the digital environment. Metacognition was the central concept from a theoretical point of view in the study conducted by Nieto-Márquez, Baldominos, and Pérez-Nieto (2020). Given the important relationship between the latter and the prediction, i.e. improving students' academic performance, the investigation was carried out on a group of 130 primary school students aged 8 years to measure the implications of using the "Smile and Learn" platform in identifying metacognitive effects. Using the instrument entitled Junior Metacognitive Awareness (Jr. MAI), an external assessment of students' metacognition was carried out, and the results showed a positive relationship between digital exercises with immediate feedback, logical processes, and metacognition (Nieto-Márquez, Baldominos and Pérez-Nieto, 2020). In a case study with 34 primary school students, the subjects' explanations of learning mediated by digital devices were analyzed. The qualitative analysis brought to light aspects concerning how the students' ideas generated the possibility of facial, vocal, or gesture recognition to solve everyday

problems. The results of the study indicated that the apps developed represent a promising start for the understanding of primary school students of the principles of digital device-mediated learning and the role they play in everyday life. The findings of the study focused on the need to support future generations to become online content creators in an era of digitization (Vartiainen, Toivonen, Jormanainen, Kahila, Tedre & Valtonen, 2021). Thus, these studies show the multiple valences of using digital devices and tools in creating the digital citizens of the future.

3.3. Dimensions of digital citizenship included in empirical research

Most of the articles included in the systematic review focus on the direction of digital literacy described by Ribble (2015) or Carretero et al. (2017), the two concepts being treated similarly by the theorists. While some of the studies included in the review have the main goal to measure the implications of the use of digital tools in developing specific skills and improving school performance (Thangamani, 2019; Lozada-Yánez, La-Serna-Palomino & Molina-Granja, 2019; Hazar, 2020; Bratitsis & Mantellou, 2020; Kurvinen, Kaila, Laakso & Salakoski, 2020), others aim to identify the effects of virtual environments on the personality and behaviors of young learners (Davidsen & Christiansen, 2014; Rambousek, Štípek, Vaňková, 2016; Wildová, Vartiainen, Toivonen, Jormanainen, Kahila, Tedre & Valtonen, 2021; Nieto-Márquez, Baldominos & Pérez-Nieto, 2020; Azis & Ahmad, 2022; Kacan & Kacan, 2022).

The second dimension theorized by Ribble (2015) and Carretero et al. (2017) entitled digital communication, i.e. communication and collaboration is targeted by several studies aiming to identify the valences of digital media in promoting effective relationships between all educational actors (Chiarelli, Szabo & Williams, 2015; Ejsing-Duun & Skovbjerg, 2016; Graça, Quadro-Flores & Ramos, 2022). Another dimension of digital citizenship targeted in the reviewed studies is problem-solving (Carretero et al., 2017), reflected in several articles included in the review (Davidsen & Christiansen, 2014; Lai, 2016; Vartiainen, Toivonen, Jormanainen, Kahila, Tedre, Valtonen, 2021; Kacan & Kacan, 2022). Content creation (Carretero et al., 2017) is an area pursued to a small extent in the articles selected for analysis, with a few by Ejsing-Duun and Skovbjerg (2016) and Vartiainen, Toivonen, Jormanainen, Kahila, Tedre, and Valtonen (2021).

Dimensions such as digital access, digital etiquette, digital legislation, digital commerce, digital rights and responsibilities, digital safety and security, and digital health and well-being theorized by Ribble (2015) or digital safety defined by Carretero et al. (2017) were not identified in any of the studies included in the review. This could be explained by the fact that the groups of participants were made up of young schoolchildren, which did not allow digital content to be addressed.

3.4. Interdisciplinary Perspectives for studying digital citizenship

Most of the reviewed studies present the approach of language and communication contents alongside those specific to digital citizenship (Anderson, 2018; Germeroth, Kelleman & Spartz, 2018; Hazar, 2020; Gezer & Anilan, 2021; Şahin & Gül Özenç, 2021). On the other hand, the integration of mathematics-specific content alongside digital content is the second trend noted in the studies reviewed (Higgins, Crawford, Huscroft-D'Angelo & Horney, 2016; Anderson-Pence, Tygret & Crocker, 2020; Kurvinen, Kaila, Laakso, Salakoski, 2020; Ökördi & Molnár, 2022). This can be explained by the fact that the general trend at early school age is to develop literacy and numeracy skills, which are essential for the harmonious development of the pupil. In addition, one study has focused on the implications of digital tools in the development of manual skills through the use of digital portfolios and apps facilitating the creation of e-books (Saarinen, Seitamaa-Hakkarainen & Hakkarainen, 2016), and another on the development of artistic skills in music (Germeroth, Kelleman & Spartz, 2018).

The other studies reviewed cover various aspects of the effects of digital tools and devices in the development of behaviors, metacognition, and the types of choices Internet users make (Nieto-Márquez, Baldominos & Pérez-Nieto, 2020; Vartiainen, Toivonen, Jormanainen, Kahila, Tedre & Valtonen, 2021; Kurniawati, Kartowagiran, Wuryandani, Retnawati, & Herwin 2022). This highlights the interest in intensively leveraging digital tools and media for general literacy among primary school students, including digital literacy.

3.5. Quantitative and qualitative methods used in empirical research

The studies included in the analysis present both quantitative and qualitative methods of data collection in varying proportions. Only thirteen of the analyzed research papers gather information through qualitative methods, which is explained by the fact that the latter is time and energy-consuming (Ejsing-Duun & Skovbjerg, 2016; Koç, 2019; Graça, Quadro-Flores & Ramos, 2022). The volume of information is large, thus additional effort is required to analyze it. On the other hand, the use of questionnaires and experiments based on digitally mediated educational interventions is noted (Rambousek, Štípek, Vaňková, 2016; Zafiropoulou & Maria Darra, 2019; Kacan & Kacan, 2022). In this way, the effects of digitally mediated intervention on the development of specific digital citizenship skills in primary school students are measured. Thus, the use of quantitative methods in the studies included in the review follows the general trend from empirical research, including those for early school age.

3.6. Differences by year of publication

In terms of the time criterion, we observed differences in handling the content related to digital citizenship. While in the past times the review publications follow the relationship between the use of digital devices and the development of student's skills and competencies (Davidsen & Christiansen, 2014; Lai, 2016; Özbek & Girli, 2017; Karalar & Sidekli, 2017), the most recent studies investigate the implications in virtual learning and literacy of young learners through the use of various digital platforms and applications (Azis & Ahmad, 2022; Graça, Quadro-Flores & Ramos, 2022). The transformations in the usage of digital devices by children are well represented. Tablets and iPods are digital media whose effects are analyzed in early research (2016, Lai; Karalar & Sidekli, 2017; Özbek & Girli, 2017), while in more recent research the effects of their use are not a declared goal, given that they are no longer so widely used by pupils. The focus is now on the software component, i.e. the platforms and interactive applications accessed by young learners in developing digital skills and learning capacity (Kacan & Kacan, 2022; Kurniawati, Kartowagiran, Wuryandani, Retnawati, & Herwin, 2022; Quadros-Flores, Ramos Gonçalves & Ramos, 2022). Thus, time has shaped how digital devices are used by students and the research interests of theorists in the field.

3.7. Defining aspects determined by the cultural background

Most of the research illustrated in the articles included in the study was undertaken in Europe. Thus, twenty-four investigations had participants represented by European students and teachers, ten were represented by the American population and only five were of Asian origin. This may have economic, cultural, or political reasons, or may be explained by the selection procedures for the articles included in the analysis. Also, the creation of theoretical models was the reason for the necessity to study the multifaceted implications of digital technology in the act of learning and the forming of specific cyber citizenship behaviors. Ribble (2015) and Carretero et al. (2017) are theorists who have theorized practices in the online environment, generating eloquent benchmarks for digital citizenship with all dimensions included.

All the studies reviewed present a variety of tools, applications, and platforms, without being able to distinguish from a cultural point of view on this issue.

4. Discussions

This systematic review is an analysis of studies that focus on how specific digital citizenship content is taught in primary classrooms. To accomplish this, we selected

articles published between 2010 and 2022 that focused on different practices centered on digital citizenship training in elementary school education. Although we can notice a continuous effort to support the formation of digital competencies, we note the lack of a valid strategy for literacy and the formation of specific behaviors for young students.

4.1. Summary of results

At the end of this exploration of the practices implemented in elementary education on digital citizenship, we can formulate some general conclusions. It is worth noting that the year of publication is a determining element in the choice of research focus, with early investigations focusing on the influence of digital device use on students' behaviors and skills. The most recent studies examine the role that various digital platforms and apps play in digital literacy and learning outcomes. Given that the investigations included in the analysis had samples of students aged 8 to 11, it is notable that the definition of digital citizenship has taken a more practical form. Most of the theorizations focused on digital literacy concerning the need to form basic skills in the early years of school. In the analysis, we identified two trends in theorizations of digital citizenship: one related to the interdisciplinary manner in which specific content is introduced, and the other to personal development.

Notably, the research included only addresses some of the dimensions of digital citizenship theorized by Ribble (2015) and Carretero et al. (2017) such as digital communication, i.e. communication and collaboration, content creation, or problem-solving. Other dimensions such as digital access, digital etiquette, digital legislation, digital commerce, digital rights and responsibilities, digital safety and security, and digital health and well-being theorized by Ribble (2015) or digital safety defined by Carretero et al. (2017) are not targeted at all in the selected studies. This is important for both theorists and educational practitioners to consider. Although primary school students have limited abstraction capacities, more complex digital citizenship issues can be addressed by using appropriate teaching methods that facilitate understanding.

4.2. The limitations of the study

There are several limitations due to the specifics of the method chosen for this study. In this respect, we can say that the key concepts used represent certain barriers to the specific analysis. In addition to this, the limitation of integrating the review-only research published in English is another aspect that limits the study. The degree of subjectivity is also an aspect to consider in this discussion, taking into account the influence that each researcher has on the data they analyze. The inclusion of publications with

predominantly European and American subject groups is another limitation of the study, for which the influence of family economic status and the level of community development on the formation of specific digital citizenship skills in young schoolchildren could be considered in future research.

Most studies included in the review focused on digital literacy, digital communication, and information, but areas such as digital access, digital etiquette, digital legislation, digital commerce, digital rights and responsibilities, digital safety and security, and digital health and well-being theorized by Ribble (2015), or digital safety defined by Carretero et al. (2017) are not dimensions to be addressed in the research included in the systematic review.

Only studies that investigated classroom practices used towards the formation of specific digital citizenship skills were included in the review, an aspect that could be a limitation, to the exclusion of the theories that address the concept that underpinned our research. However, there are sustained efforts to theorize digital citizenship, especially against the background of the rapid technologization of all areas of human activity, reflected in the literature.

4.3. Practical implications

In the context of the increasing technologisation of all areas of human activity, there is a growing need for specific skills training for a responsible digital citizen. Providing content adapted to trends in a highly virtualized society is becoming a prerequisite for training generations to prepare for future changes. Thus, we note a sustained effort to theorize the concept of digital citizenship and to develop specific practices to support students, without being the aim of our research. The link between theory and application, therefore aims to formulate a curriculum adapted to the needs of today's students. This will promote the diversification of practices implemented in the classroom, towards the formation of generations of responsible digital citizens.

In this study, various practices implemented in the classroom with elementary school students have been presented, grounded in theory. Although the analysis focused on the applied-practical side, the effort of the theorists to define the concept of digital citizenship is notable. Although most of the studies analyzed were carried out in Europe and the USA, there is a general trend towards technologization and the development of new skills for students.

The studies reviewed provide models for the integration of content specific to digital citizenship through the use of interdisciplinary strategies that combine knowledge from different fields (mathematics, language and communication, and visual arts). We note links with disciplines such as mathematics, language and communication, and visual arts,

which facilitate the formation of skills for the digital citizens of the future. More complex content such as the digital footprint or digital justice is presented in an accessible form, adapted to the level of understanding of young school children. Digital citizenship education can also be achieved through lessons in a single subject. Against the background of increasing efforts to formulate a specific curriculum, learning activities could be focused in the direction of the dimensions mentioned by leading theorists (Ribble, 2015; Carretero et al., 2017). In this respect, the present study aimed to document existing practices to support the integration of specific digital citizenship content from the early years of schooling.

References

Alonso-Ferreiro, A., Fraga-Varela, F., & Guimerans, P. (2020). Educational plans and programs for digital competence: A geographical analysis from an educational equity perspective. *IEEE Revista Iberoamericana de Tecnologias Del Aprendizaje*, *15*(4), 407–416, DOI: 10.1109/RITA.2020.3033206

Anderson, T.L. (2018). E-readers make a difference for diverse readers*. International Journal of Technology in Education and Science* (IJTES), *2*(1), 40-56. Retrieved from https://www.ijtes.net/index.php/ijtes/article/view/10

Anderson-Pence, K. L., Tygret, J. A. & Crocker, L. (2020). Leveraging Tutorial Instructional Software to Enhance Classroom Mathematical Discussions: An Exploratory Mixed-Methods Study. *Educational Research: Theory and Practice*, *31*(3), 74-93. Retrieved from https://files.eric.ed.gov/fulltext/EJ1274354.pdf

Azis, U. & Ahmad, M. (2022). Analysis of the Effect of Online-Based Interactive Digital Learning Media Word Wall on Pancasila and Citizenship Education Learning Outcomes of Elementary School Students. *Jurnal Paedagogy*, *9*(3), 609-615. DOI: 10.33394/jp.v9i3.5344

Ball, A. & Skrzypek, C. (2019). Closing the broadband gap: A technology-based student and family engagement program. *Children and Schools*, *41*(4), 229–237. DOI: 10.1093/cs/cdz015

Bratitsis, T. & Mantellou, M. (2020). Using digital storytelling for teaching the subtraction algorithm to 2nd-grade pupils. *Themes in Learning, 13*(1), 55-68. Retrieved from http://earthlab.uoi.gr/tel

Carretero, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use*. DOI: 10.2760/38842

Chen, M. B.,Wang, S. G., Chen, Y.N. & Chen, X. F., & Lin, Y. Z. (2020). A Preliminary Study of the Influence of Game Types on the Learning Interests of Primary School Students in Digital Games. *Education Sciences*, *10*(4), 96. DOI: 10.3390/educsci10040096

Chiarelli, M. & Szabo, S. & Williams, S. (2015). Using ClassDojo to help with classroom management during guided reading. *Texas Journal of Literacy Education. 3*(2), 81-88. Retrieved from https://files.eric.ed.gov/fulltext/EJ1110950.pdf

Davidsen, J. & Christiansen, E. (2014). Mind the hand: A study on children's embodied and multimodal collaborative learning around touchscreens. *Designs for learning*. *7*(1), 34-52. DOI: 10.2478/dfl-2014-0010.

Demir-Kaçan, S. & Kaçar, A. (2022). Looking for problem scenarios with robotic coding: Primary school example in Turkey. *International Journal of Psychology and Educational Studies*, *9*(2), 525-538. DOI: 10.52380/ijpes.2022.9.2.603

Dovigo, F. (2021). The role of teachers' attitude towards the use of the tablet in the first-grade elementary classroom. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, *17*(3), 234-248. Retrieved from https://files.eric.ed.gov/fulltext/EJ1335776.pdf

Ejsing-Duun, S. & Skovbjerg, H. M. (2016). Copycat or Creative Innovator? Reproduction as a Pedagogical Strategy in Schools. *The Electronic Journal of e-Learning*, *24*(2), 83-93. Retrieved from www.ejel.org

Germeroth, C., Kelleman, B., & Spartz, J. (2018). Lyrics2Learn: Teaching fluency through music and technology. *Education Sciences*, *8(3),* 91. DOI: 10.3390/educsci8030091

Gezer, B. & Anılan, H. (2021). The Effect of Digital Materials on Listening Comprehension Levels of Second Grade Elementary Students. *Acta Didactica Napocensia*. *14(1),* 127-141. DOI: 10.24193/adn.14.1.10.

Gleason, B., & von Gillern, S. (2018). Digital citizenship with social media: Participatory practices of teaching and learning in secondary education. *Educational Technology & Society, 21(1),* 200–212. Retrieved from https://www.jstor.org/stable/26273880

Graça, V., Quadro-Flores, P., & Ramos, A. (2022). The Integration of the Digital Platform Educaplay in Interdisciplinary Paths in the 1st and 2nd Basic Education Cycles. *Athens Journal of Education*, *9*(3), 377–392. DOI: 10.30958/aje.9-3-2

Green, S., Higgins, J. P. T., Alderson, P., Clarke, M., Mulrow, C. D., & Oxman, A. D. (2015). What is a systematic review? In J. P. T. Higgins, & S. Green (2015). *Cochrane Handbook for systematic reviews of Interventions* [E-Reader Version]. Retrieved from www.cochrane-handbook.org

Gutierrez de Blume, A. P., Akcaoglu, M., & Chambers, W. (2016). Supporting metacognitive awareness and strategy use through digital photography in a rural school*. National Youth-At-Risk Journal, 2*(1), 18–40. DOI: 10.20429/ nyarj.2016.020103

Hazar, E. (2020). Use of Digital Games in Teaching Vocabulary to Young Learners. *Educatia 21* Journal, *19*(12), 98-104. DOI: 10.24193/ed21.2020.19.12

Higgins, K. N., Crawford, L., Huscroft-D'Angelo, J., & Horney, M. (2016). Investigating student use of electronic support tools and mathematical reasoning. *Contemporary Educational Technology*, *7*(1), 1-24. DOI: 10.30935/cedtech/6160

Hongngam, K., Injumpa, D., & Chanapai, K. (2022). The Development of Digital Technology to Support Learning in Children with Disabilities. *International Education Studies*, *15*(4), 117-124. DOI: 10.5539/ies.v15n4p117

James, C., Weinstein, E. & Mendoza, K. (2021). *Teaching digital citizens in today's world: Research and insights behind the Common Sense K–12 Digital Citizenship Curriculum*. [E-Reader Version] Retrieved from https://www.commonsense.org/system/files/pdf/2021-08/common-sense-education-digital-citizenship-research-backgrounder.pdf

Jenson, J. & Muehrer, R.. (2013). Playing and learning: An iPad game development case study. *Canadian Journal of Education and Technology*, *42*(3). 244-251. DOI: 10.21432/T2ZS5H

Kaczorowski, T. & Raimondi, S. (2014). eWorkbooks for Mathematics: Mapping the Independent Learning Experiences of Elementary Students with Learning Disabilities. *Journal of Learning Analytics*, *1*(3), 179–182. DOI: 10.18608/jla.2014.13.17

Karalar, H. & Sidekli, S. (2017). How do second-grade students in primary schools use and perceive tablets? *Universal Journal of Educational Research*. *5*(6), 965-971. DOI: 10.13189/ujer.2017.050609.

Kim, J. S., Asher, C. A., Burkhauser, M., Mesite, L., & Leyva, D. (2019). Using a Sequential Multiple Assignment Randomized Trial (SMART) to Develop an Adaptive K–2 Literacy Intervention With Personalized Print Texts and App-Based Digital Activities. *AERA Open*, *5*(3), 1-18. DOI: 10.1177/2332858419872701

Kloos, H. Sliemers, S., Cartwright, M., Mano, Q. & Stage, S. (2019). MindPlay Virtual Reading Coach: Does It Affect Reading Fluency in Elementary School*? Frontiers in Education*. *4*(1). DOI: 10.3389/feduc.2019.00067

Koç, S., & Chambers, M. (2019). Using the Number Line and Educreations in a Second Grade Classroom: A Collaborative Action Research Project. *The Turkish Online Journal of Educational Technology*, *18*(4). DOI: 10.21125/iceri.2017.0724

Kurniawati, K., Kartowagiran, B., Wuryandani, W., Retnawati, H., & Herwin, H. (2022). Portraits of elementary schools in practicing integrated multiliteracy in learning: A phenomenological study. *Cypriot Journal of Educational Science*. *17*(8), 2720-2732. DOI: 10.18844/cjes.v17i8.7801

Kurvinen, E., Kaila, E., Laakso, M. J., & Salakoski, T. (2020). Long-term effects on technology enhanced learning: The use of weekly digital lessons in mathematics. *Informatics in Education*. *19*(1), 51-75. DOI: 10.15388/infedu.2020.04

Lai, C.-S. (2016). Third Graders' Understanding of Air Concepts Facilitated by the iPod Inquiry Teaching Method. *International Journal of Research in Education and Science (IJRES)*, *2*(1), 1–9. Retrieved from www.ijres.net

Lara Nieto-Márquez, N., Baldominos, A., & Pérez-Nieto, M. Á. (2020). Digital teaching materials and their relationship with the metacognitive skills of students in primary education. *Education Sciences*, *10*(4), 114. DOI: 10.3390/educsci10040113

Lozada, R., La-Serna-Palomino, N. & Molina-Granja, F. (2019). Augmented Reality and MS-Kinect in the Learning of Basic Mathematics: KARMLS Case. *International Education Studies*. *12(*9). 54. DOI: 10.5539/ies.v12n9p54.

McDonald, J., & Czerniak, C. (1994). Developing interdisciplinary units: Strategies and examples. *School Science & Mathematics*, *94*(1), 5–10. DOI: 10.1111/ j.1949-8594.1994.tb12281.x

Newman, M., & Gough, D. (2020). A systematic review in educational research: Methodology, perspectives, and application. In O. Zawacki-Richter, M. Kerres, S. Bedenlier, M. Bond, & K. Buntins (2020). *Systematic reviews in educational research* [E-Reader Version]. DOI: 10.1007/978-3-658-27602-7

Ökördi, R. & Gyöngyvér M. (2022). Computer-Based Intervention Closes Learning Gap in Maths Accumulated in Remote Learning. *Journal of Intelligence 10*(3), 58. DOI: 10.3390/jintelligence10030058

Özbek, A. B. & Girli, A. (2017). The Effectiveness of a Tablet Computer-aided Intervention Program for Improving Reading Fluency. *Universal Journal of Educational Research 5*(5), 757-764, DOI: 10.13189/ujer.2017.050508

Quadros-Flores, P., Ramos Gonçalves, D. & Ramos, A. (2022). Technology and methodology: the "MADE BY THEM TO THEM" approach in early childhood. *Digital Education Review*, *41*(2022), 82-92. DOI: 10.1344/der.2022.41.82-92

Rambousek, V., Štípek, J., & Vaňková, P. (2016). Contents of Digital Literacy from the Perspective of Teachers and Pupils. *Procedia-Social and Behavioral Sciences*, *217*(2016), 354–362. DOI: 10.1016/j.sbspro.2016.02.101

Rambousek, V., Štípek, J., & Wildová, R. (2015). ICT Competencies and their Development in Primary and Lower-secondary Schools in the Czech Republic. *Procedia-Social and Behavioral Sciences*, *171*(2015), 535–542. DOI: 10.1016/j.sbspro.2015.01.158

Rapada, R., Javier, R., Lansangan, L., Samosa, R. & Vicente, Pia. (2021). Animated Video Story as Innovative To Improve Grade 3 Learners' Story Writing Skills. *International Journal of Multidisciplinary Research Review*, 1 (2021) 1-12. DOI: 10.13140/RG.2.2.31217.20325.

Ribble, M. (2015). *Digital Citizenship in Schools: Nine elements all students should know* (3rd edition). Washington DC: International Society for Technology in Education

Ribble, M., Bailey, G. D. & Ross, T.W. (2004). *Digital Citizenship: Addressing Appropriate Technology Behaviour*. Retrieved from https://files.eric.ed.gov/fulltext/EJ695788.pdf

Saarinen, A., Seitamaa-hakkarainen, P. & Hakkarainen, Kai. (2016). The Functions and Benefits of the ePortfolio in Craft Education at the Primary Level. *Design and Technology Education: An International Journal*., *21*(3), 29-40. Retrieved from https://www.learntechlib.org/p/194970/

Şahin, A. & Özenç, E. (2021). The Use of Educational Software in Teaching Initial Reading and Writing. *International Journal of Progressive Education*. *17*(4). 373-389. DOI: 10.29329/ijpe.2021.366.23.

Tadlaoui-Brahmi, A., Çuko, K., & Alvarez, L. (2022). Digital citizenship in primary education: A systematic literature review describing how it is implemented. *Social Sciences & Humanities Open*, *6*(1), 100348. https://doi.org/10.1016/j.ssaho.2022.100348

Thangamani, U. & Kwan Eu, L. (2019). Students' Achievement in Symmetry of Two Dimensional Shapes Using Geometer's Sketchpad. *Malaysian Online Journal of Educational Sciences*, *7*(1), 14-22. Retrieved from https://eric.ed.gov/?id=EJ1201774

Tomé, V. (2016). *Developing digital citizenship in children aged from 3 to 9 is a pilot project in the Portuguese region of Odivelas*. *7*(2), 196–214. DOI: 10.14605/MED721604

Vartiainen, H., Toivonen, T., Jormanainen, I., Kahila, J., Tedre, M., & Valtonen, T. (2021). Machine learning for middle schoolers: Learning through data-driven design. *International Journal of Child-Computer Interaction*, *29*(2021), 100281. DOI: 10.1016/j.ijcci.2021.100281

Yamac, A., & Ulusoy, M. (2016). The Effect of Digital Storytelling in Improving the Third Graders' Writing Skills. *International Electronic Journal of Elementary Education*, *9*(1), 59-86. Retrieved from https://files.eric.ed.gov/fulltext/EJ1126674.pdf

Zafiropoulou, B., & Darra, M. (2019). Contribution of the E-Portfolio to the Improvement of Students' Performance: Results from a Pilot Survey in the Second Grade of Primary School in Greece. *International Education Studies*, *12*(7), 119-128. DOI: 10.5539/ies.v12n7

Tools for assessing students' socio-emotional competencies. A systematic literature review

Ioana Alexandra Negru•, Ramona Paloș••

Abstract

Social-emotional competencies (SEC) represent an increasingly investigated topic in the educational context, and multiple tools have been developed to measure them. Consequently, an inventory of these tools becomes necessary for research in different educational contexts. This paper aimed to identify and analyse the existing self-reported instruments used to assess secondary school students' SEC, developed on the CASEL model and published between 2018-2022. The CASEL model was created to help design and conduct SEC development programs and focus on five dimensions: self-awareness, self-management, social awareness, managing relationships with others, and responsible decision-making. Most of the social-emotional learning programs are therefore based on the CASSEL framework. Three academic databases were searched (Google Scholar, ERIC, and ProQuest), and 1246 articles were identified. After checking the inclusion criteria, fourteen articles were included in the quantitative synthesis. Finally, eight questionnaires assessing the five SEC dimensions according to the CASEL model were identified. From this analysis, a questionnaire was noted that covers all five dimensions (i.e., the Social and emotional competencies questionnaire built by Zhou & Ee, 2012), has a relatively low number of items, and is easy to apply to children and adolescents. In addition to this questionnaire utility, developing new SEC measurement tools created on the CASEL model to offer variety remains necessary. The results of the literature review present all eight questionnaires with the dimensions they measure, the number of items, and their internal consistency. Also, this study illustrates the limitations of such a review and suggestions for future research.

Keywords: socio-emotional competencies, secondary school students, CASEL model, questionnaire.

1. Introduction

Being essential not only for physical and mental health (Ciarrochi et al., 2003; Espejo-Siles et al., 2020) but also for academic and life success (Domitrovich et al., 2017), socio-emotional competencies (SEC) have become a topic of interest in educational research (Blewitt et al., 2018; Durlak et al., 2011). For instance, previous evidence emphasized the

• Ph.D. Student, West University of Timisoara, Faculty of Sociology and Psychology, ioana.negru97@e-uvt.ro

•• Associate Professor, Ph.D., West University of Timisoara, Department of Psychology, corresponding author: ramona.palos@e-uvt.ro

predictive value of SEC in academic performance (Portela-Pino et al., 2021) and learning engagement (Greenberg, 2023), reading and math success (Oberle et al., 2014), social adjustment (Domitrovich et al., 2017; Nakamichi et al., 2021), or reducing emotional distress (Greenberg, 2023).

Considering SEC as skills that need to be developed like any other academic skill (Aguilar et al., 2019), there was a need to properly define them to allow suitable assessment and designing efficient social-emotional learning programs (SEL). According to the CASEL model (Collaboration for Academic, Social and Emotional Learning), created to aid in children's holistic development and support the adequate implementation of SEL, SEC have been characterized as "a set of skills, including recognizing and managing our emotions, developing care and concern for others, establishing positive relationships, making responsible decisions and handling challenging situations constructively and ethically" (CASEL, 2008, apud Zhou & Ee, 2012, p. 27). Thus, socio-emotionally competent people successfully recognize their emotions, understand, and manage them effectively in relationships with others, and can adapt to the complexity of social situations (Oberle et al., 2014).

Implementing effective SEL programs based on the CASEL framework requires tools that capture the accurate level of development of each dimension stipulated by the model. While documenting the article, it was found that many instruments measure one or more aspects of SEC, depending on the theoretical approach, but only some instruments cover them all. Consequently, *this systematic literature analysis aimed to investigate the most frequent self-reported tools used for measuring SEC* for secondary school students (aged between 12-15 years), according to the CASEL framework. A similar analysis was made by Muller et al. (2020), but they used different samples (i.e., students and staff from secondary school) and repertoire of skills (i.e., emotional, social, and intercultural competencies). This age range was chosen because it represents a critical stage in teenagers' life, with considerable physical, emotional, cognitive, or behavioral changes (Oberle et al., 2014). All these transformations impact how they adapt to the specific school and social environment. Moreover, during this time, teenagers try to understand themselves better, and their capacity for self-evaluation improves (Oberle et al., 2014). Because more and more emphasis is placed on identifying the children's perspective on their level of SEC development (Humphery et al., 2011), only self-reported instruments were chosen. In cases when other people (e.g., teachers or parents) make the assessment, the outcomes may be different as a consequence of the diverse environments in which they observe and interact with children (Im et al., 2019; Martinsone et al., 2022; Oberle et al., 2014; Schonmoser et al., 2022). This paper was organized into the following steps. First, a brief theoretical background of the CASEL model and the kind of skills included under the cluster of social-emotional competencies (SEC) was presented. Second, the

specialized literature from the last 5 years (2018-2022) was analysed to identify the research tools used to measure SEC. After that, the article selection procedure and the results and discussion were described.

1.1 Theory

According to the CASEL model, SEL is essential for human development (Goleman et al., 1994), supporting people in acquiring and applying knowledge and skills that help them deal with emotions, organize their actions to achieve goals, analyse the consequences of their decisions, create, and maintain healthy relationships with those around them (Greenberg, 2023). Considering SEC as *a "set of skills, behaviors, and attitudes that people need to effectively manage their affective, cognitive, and social behavior"* (Yoder, 2014, p. 2), the CASEL model divides them into intra-personal and interpersonal competencies (Domitrovich et al., 2017; Zhou & Ee, 2012). Intrapersonal competencies refer to people's ability to understand and control their emotions through *self-awareness* (the capacity to make a correct assessment of weaknesses and strengths, to set realistic goals, to understand one's feelings and behaviors and how they are interconnected; Greenberg, 2023) and *self-management* (the ability to handle thoughts, emotions, and behaviors to achieve the established goals; Denham et al., 2014). *Interpersonal competencies* are linked to the capacity to understand others' emotions (i.e., *social awareness*), build and maintain healthy relationships (i.e., *managing relationships with others*), and make responsible decisions grounded on the analysis of benefits and consequences for oneself and others (i.e., *responsible decision-making;* Domitrovich et al., 2017; Frey et al., 2000; Zhou & Ee, 2012).

Previous research has highlighted SEC's importance for students' well-being (Bhat & Chahal, 2022; Ghamary et al., 2022) and adaptation to the educational environment (Poulou, 2019), motivation for learning (Wirajaya et al., 2019), or academic performance (Zuraida & Suganda, 2021). Some studies have emphasized the value of parental help in creating opportunities for children to learn SEC (Milers et al., 2018), showing that maternal stress is negatively associated with SEC in children (Cucinella et al., 2022). Likewise, the significant role of teachers' support in growing students' SEC was highlighted (Luo et al., 2021; Supriatna et al., 2022; Hachem et al., 2022).

To develop SEC is necessary to know the level of these abilities and to create conditions to apply them in different situations and contexts to lead to long-term improvements in various areas of children's development (Greenberg et al., 2017). Although there are considerable studies on SEL programs (e.g., Durlak et al., 2011; Taylor et al., 2017; Durlak et al., 2022), the same cannot be said about the inventory of tools used to measure SEC. In their systematic review, Humphery et al. (2011) obtained a list of 12 instruments that can be used to measure SEC; three have versions that can be applied to children, parents, and teachers, and five of them only to children. The authors assert that

the development of SEC measurement tools is slower than the growing interest in SEL. In another recent systematic literature review, Muller et al. (2020) analysed the articles published between 2000-2017 to identify the tools used to measure the social and emotional competencies of pupils from preschool. They found 26 instruments for social competencies, 11 for emotional competencies, and 47 measured both competencies simultaneously. Compared to the dimensions proposed by the CASEL model, only personal and social awareness, self-management, and relationship skills were evaluated, the others generally focusing on personality and health aspects. Starting from these results, this literature review aimed to analyse studies published after 2017 that used only questionnaires based on the CASEL model.

2.1 Objectives

This systematic literature review aimed to identify and analyze the existing self-reported instruments used to assess SEC of secondary school students (aged between 12-15 years), tools based on the CASEL framework. In this sense, the research sought to answer the following question: *What are the main self-reported tools for measuring the SEC of secondary school students, based on the CASEL model, that can provide the information needed to design SEL programs*?

2.Methods

2.1 Inclusion criteria

For an article to be included in the study, it was required to meet the following criteria: (a) to be written in English; (b) published between 2018-2022 in peer review specialized journals; (c) to include only participants who are secondary school students (aged between 12-15 years); (d) to be a correlational or quasi-experimental study; (e) to include self-report instruments developed based on the theoretical approach of *the CASEL* model.

2.2 Search strategy and selection of studies

Databases search: To conduct the systematic literature review, three databases were used: ERIC (Education Resources Information Center), ProQuest, and Google Scholar.
Search terms: Several keywords relating to measurement (e.g., ”assessment”, ”measure”), cognition (”social AND emotional”), instruments (”self-report”, ”questionnaire”), and other actors groups (adolescents and teenagers) were combined to identify the instruments.

Table 1. Fields and search terms

Field	Operator	Keywords
Measurement	AND	”assessment” or ”measure”
Cognition	AND	”social AND emotional” OR ”self-management” OR ”self-awareness” OR ”managing relationship” OR ”responsible decision making”
Instruments	AND	”self-report” OR ”questionnaire”
Intended actors	AND	”adolescents” OR ”teenagers” OR ”13-year-old” OR ”14-year-old” OR ”15-year-old” OR ”7th grade” OR ”8th grade”
Irrelevant fields	NOT	teaching OR covid-19 OR families & family life OR teachers OR qualitative research OR mental disorder OR pandemics OS anxiety OR higher education OR systematic review OR literature review OR nurses OR colleagues & universities OR public health OR college students OR medical personnel OR older people OR mother OR autism OR young adults OR burnout OR pediatrics OR adults OR hospital

2.3 Study selection

After all the articles had been downloaded, the selection process began. 1246 articles were identified, but 13 duplicate documents were removed. 1233 articles left to read the title and abstract. After this process, 1032 were eliminated because they did not address the concept of SEC. After full reading, a further 187 articles were excluded because they did not correspond to the selection criteria: 11 – were not in English; 49 – were not correlational or quasi-experimental studies; 15 – did not use self-report instruments; 38 - the participants were not between 12-15 years of age; 35 were not peer-reviewed, and 53 were not based on the CASEL model. After completing this stage, 14 articles remained and were included in the quantitative synthesis.

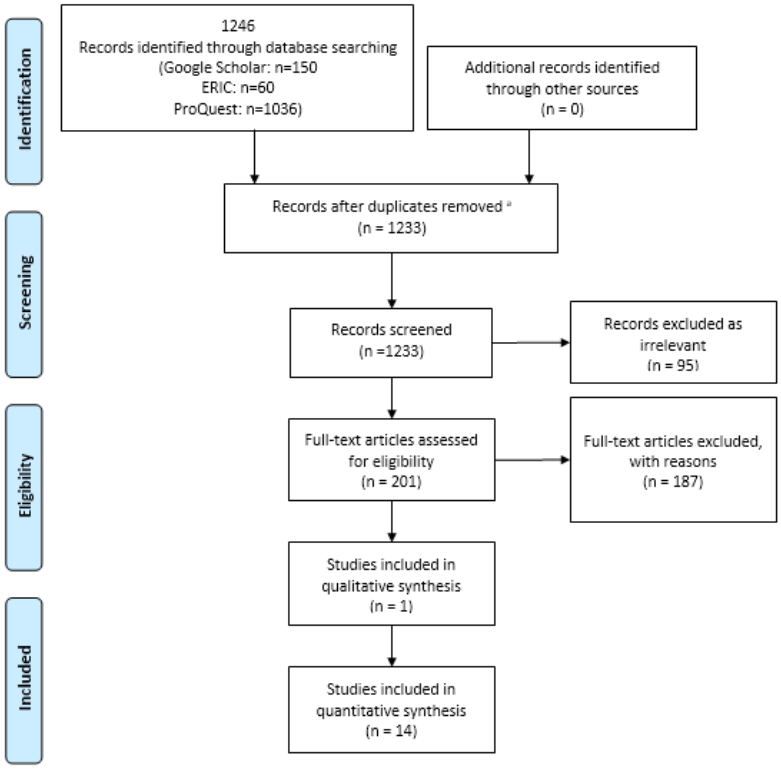


Figure 1. The flowchart of the selection process

2.4 Data analysis

The fourteen founded articles were organized according to the instruments they used to assess SEC, emphasizing the presence of the five dimensions and the number of items.

3.Results

After reading the fourteen final articles, a list of instruments was created. Table 2 presents each questionnaire and the authors who developed them, the measured dimension from the CASEL model perspective, the number of items, and their citation frequency in the specialized literature. Cronbach's Alpha values were taken from the studies included in the analysis. Thus, the final analysis found eight questionnaires: seven assessed all the five dimensions stipulated by the CASEL model, and one of them measured only two dimensions, self-management, and social awareness, respectively.

Table 2. Distribution of the self-reported instruments identified through the systematic literature review

	Tool	Author, Year	Type	No of citation	SA	SM	SoA	MRO	RDM	No of items	α	Studies found
1	Questionnaire adapted from Yoder, (2014)	Yoder (2014)	Scaled Quest.	253	x	x	x	x	x	62	0.84	Anisa et al., (2019)
2	Social and emotional competences questionnaire	Zhou & Ee (2012)	Scaled Quest.	116	x	x	x	x	x	25	0.72 – 0.93	Zahid et al., (2021); Bhat & Chahal, (2022); Wirajaya et al., (2019); Dinh et al., (2021); Ghamary et al., (2022); Qayyum & Hussain, (2019); Portela-Pino et al., (2021)
3	Social and Emotional Competences Scale	Zych et al., (2018)	Scaled Quest.	75	x	x	x	x	x	16	0.91	Ismail & Alyami, (2021)
4	Social Skills Improvement System, Social Emotional Learning Edition Brief Scales – Student Form (SSIS-SELb-S)	Anthony et al., (2020)	Scaled Quest.	23	x	x	x	x	x	20	0.91	Cefai et al., (2022)
5	Social-Emotional Learning Scale	Totan (2018)	Scaled Quest.	10	x	x	x	x	x	23	0.82	Temircan, (2022)

6	Social and emotional function test	Kwon (2011)	Scaled Quest.	16	x	x	x	x	x	52	0.97	Song & Kim, (2022)
7	Social and Emotional Learning Scale	Fernández-Martín et al., (2022)	Scaled Quest.	3	x	x	x	x	x	30	0.82	Fernández-Martín et al., (2022)
8	CORE	CORE (2017)	Scaled Quest.			x	x			18	0.85 & 0.81	Soland et al., (2022)

Note: SA = Self-awareness; SM = Self-management; SoA = Social awareness; MRO = Managing relationships with others; RDM = responsible decision-making.

A questionnaire adapted from Yoder (2014) was the most cited instrument in Google Scholar (253 times), but in this analysis, it has been used in one research. It is also quite difficult to apply because of the high number of items (62). The original version of Yoder's questionnaire (Yoder, 2014) is called "*Self-Assessing Social and Emotional Instruction and Competencies: A Tool for Teachers*" and helps teachers analyse and reflect on their teaching practices and SEC. It is based on the five CASEL concepts and has two scales: *Social Teaching Practices* and *Instructional Teaching Practices*. *Social Teaching Practices* have questions about student-centered discipline, teacher language, responsibility and choice, warmth, and support. *Instructional Teaching Practices* cover aspects of cooperative learning, classroom discussions, self-assessment and self-reflection, balanced instruction, academic press and expectations, and competence building.

The *Social and Emotional Competence Questionnaire* (SECQ – Zhou & EE, 2012) has 116 citations in different studies, and this analysis found seven studies. It includes 25 questions structured in 5 subscales according to the CASEL model and assesses children's behavior in family, school, and community contexts, and can be applied to children from 3rd grade to 12th grade. Answers are given on a Likert scale from 1 (“not at all true of me”) to 6 (“very true of me”).

The *Social and Emotional Competences Scale* is a 16-item instrument developed by Zych et al. (2018), cited 75 times in the literature. The first version of the questionnaire included 50 items, but the final version had only 16 items, and the answers were given on a 5-point Likert scale (from “strongly disagree” to “strongly agree”). The instrument is easy to apply and includes four subscales: self-awareness, self-awareness and motivation, social awareness and prosocial behavior, and responsible decision-making.

The Social Skills Improvement System, Social Emotional Learning Edition (SSIS-sel) Student Form (Anthony et al., 2020) has 23 citations and includes 20 items. This scale was built based on the CASEL model, created specifically to measure social and emotional learning in the case of intervention research. The students need to answer on a 4-point Likert scale (from “not true” to “very true”). Also, this instrument is an adaptation of the SSIS SEL Brief Scales - Student Form, a shorter version.

The *Social-Emotional Learning Scale* was developed by Totan (2018) and cited only ten times. The scale was designed specifically for teenagers and had all five dimensions from the CASEL model. The scale is made of 23 items and five sub-dimensions, and the answers are given on a 5-point Likert.

The *Social and emotional function test* was developed by Kwon (2011) based on the CASEL model, includes 52 items, and was cited 16 times. This questionnaire was developed on the Korean population of students and adolescents to understand emotions and resilience. It includes four subscales: social competence, emotional regulation, empathy, and self-esteem. Responses are based on a four-point Likert scale from "not at all" to "always".

The *Social and Emotional Learning Scale* was created by Fernández-Martín et al. (2022) to measure social-emotional skills. The instrument is based on the CASEL model and includes 30 items. So far, it is not very well known and has only three citations.

The *CORE* platform offers several scales, two of which assess, according to the CASEL model, the dimensions of self-management and social awareness through 18 items.

4. Discussion

This systematic literature review aimed to identify and analyse the existing self-reported instruments used to assess SEC of secondary school students (aged between 12-15 years), based on the CASEL model. According to our results, the number of instruments measuring SEC is low, although the interest in developing and analyzing SEL programs is significantly increased. Thus, eight questionnaires were identified, and the SECQ (Zhou & Ee, 2012), based on the CASEL framework, has been used significantly more than the rest of the instruments over the last five years (116 citations in Google Scholar). The clear structure, the relatively small number of items (25 items distributed on five items for each subscale) that allows for less time to fill out, and the free access made it increasingly used in the educational field to evaluate SEC. Furthermore, a brief examination of the Google Scholar database revealed that the SECQ was applied with a higher frequency to students aged between 12–15 years and a lower frequency in the age range of 7–8 and 17–18 years. The other identified tools can also be helpful in certain situations, even if some have too many items (Yoder, 2014 - 62 items, or Zych et al., 2018 - 50 items), which require a longer time to fill out, have a low number of citations in Google Scholar, indicating less frequent use (e.g., Kwon, 2011), or do not cover all five dimensions of the CASEL model (e.g., CORE).

A possible explanation for the reduced number of the identified tools could be related to the inclusion criteria: the conceptual framework for defining SEC, the subjects' age, and the type of questionnaires. Thus, only the instruments built on the CASEL model were considered, this being the framework most frequently used in the design of SEL programs. For example, Muller et al. (2020) obtained a list of tools that highlighted a combination of different measured dimensions included in the SEC category (e.g., student engagement, academic self-efficacy, goal-oriented behavior, self-regulation, self-discipline, or emotional intelligence). Unfortunately, only a few of these tools targeted some of the dimensions proposed by the CASEL model and defined according to it, but none on all five. The literature review included only publications up to 2017, while the current analysis adds studies published between 2018-2022. This allowed the list to be completed with other tools that contribute to identifying the level of SEC development, based on which SEL programs can be designed, the essential purpose of which is to improve the SEC. Another literature review identified and analyzed the questionnaires that were based on Denham's model (2005, as

cited in Humphrey et al., 2011) in which SEC included two kinds of skills (Humphrey et al., 2011): emotional competence skills (self-awareness, self-management, social awareness) and relational/prosocial skills (social problem solving; relationship skills). The first three emotional competence skills are also found in the CASEL model, the first two as intrapersonal competencies and the last as interpersonal competence. "Relational/prosocial skills" can be compared to "managing the relationship with others" because it refers to cooperation between colleagues, listening skills, or help-seeking. In contrast, for the "social problem-solving skills", we can talk of correspondence with the "responsible decision-making" dimension from CASEL only if it is seen as a skill that influences people's adaptive functioning in the real-life social environment.

Regarding the age of subjects, many studies and literature reviews focus only on preschoolers (e.g., Blewitt et al., 2018), while the present research was limited to secondary school students. This age range was chosen because young people are now experiencing challenging transformations, specific to the pre-and adolescent period (Durlak et al., 2022; Oberle et al., 2014), where a high level of SEC development can be quite valuable for adapting to the social environment, whether we are talking about school, group of friends or community (Durlak et al., 2022; Martinsone et al., 2022).

Concerning the type of tools, all the selected instruments are self-report measures. Some researchers claim that in the case of self-reported questionnaires, the responses can be influenced by the reduced introspective capacities of the participants (Chambers & Windschitl, 2004), which could affect the answers' accuracy. On the other hand, the children's perception of SEC development is essential for their growth and the aspects on which the SEL program will focus (Humphrey et al., 2011). When the teachers or parents are asked about the children's SEC, the answers may be influenced by the environment in which they are observed and spend more time generating discrepancies with self-assessment (Schonmoser et al., 2022; Im et al., 2019).

Limitations and perspectives

The current literature review has several limitations. First, the number of analysed databases is quite small, limited to Google Scholar, ERIC, and ProQuest. If other databases had been searched, more results would have been identified. Second, it is also possible that the keywords used in the articles search were insufficient. Third, the investigation based only on the CASEL framework reduced the number of instruments used in measuring the SEC level. Thus, the different perspectives of approach and definition of SEC caused essential instruments to have been omitted through the inclusion criteria. Despite these limitations, our results add new information to the existing literature on SEC measurement tools based on the CASEL model, with an essential impact on the design of programs to develop these competencies (i.e., SEL programs).

5.Conclusion

Previous research illustrated different types of instruments to measure SEC based on the CASEL model. The SECQ has been much more widespread among researchers in recent years than other instruments. Being easy to apply, this questionnaire can be suitable for secondary school students as a first step in identifying the level of SEC, followed by the design of a SEL program. Moreover, following the factor analysis, a shortening of the instrument can facilitate further its use in research that explores different variables shaped by the level of SEC. At the same time, developing other SEC evaluation tools is recommended to have a greater variety in this field.

References

Anisa, L., Suganda, L. A. & Jaya, H. P. (2019). Indonesian English Teachers' Social-Emotional Competence and Students' English Learning Motivation. *Indonesian Journal of English Language Teaching and Applied Linguistics, 4*(1).

Anthony, C. J., Elliott, S. N., DiPerna, J. C. & Lei, P. W. (2020). The SSIS SEL Brief Scales–Student Form: Initial Development and Validation. *School Psychology, 35*(4), 277-283. http://dx.doi.org/10.1037/spq0000390

Aqguilar, P., Lopez-Cobo, I., Cuadrado, F. & Benitez, I. (2019). Social and Emotional Competences in Spain: A Comparative Evaluation Between Spanish Needs and an International Framework Based on the Experiences of Researchers, Teachers, and Policymakers. *Frontiers in Psychology, 10, 2127.* https://doi.org/10.3389/fpsyg.2019.02127

Bhat, T. A. & Chahal, D. (2022). A study of socio-emotional competence among adolescents in relation to mental health. *Rabindra Bharati Journal of Philosophy, 13*(6), 20-24.

Blewitt, C., Fuller-Tyszkiewicz, M., Nolan, A., Bergmeier, H., Vicary, D., Huang, T., ... Skouteris, H. (2018). Social and emotional learning associated with universal curriculum-based interventions in early childhood education and care centers: A systematic review and meta-analysis. *JAMA Network Open*, 1(8), https://doi.org/10.1001/jamanetworkopen.2018.5727e185727

Cefai, C., Camilleri, L., Bartolo, P., Grazzani, I., Cavioni, V., Conte, E., Ornaghi, V., Agliati, A., Gandellini, S., Tatalovic Vorkapic, S., Poulou, M., Martinsone, B., Stokenberga, I., Simões, C., Santos, M. & Colomeischi, A. A. (2022). The effectiveness of a school-based, universal mental health programme in six European countries. *Frontiers in Psychology.* http://doi.org/10.3389/fpsyg.2022.925614

Chambers, J. R., & Windschitl, P. D. (2004). Biases in social comparative judgments: The role of nonmotivated factors in above-average and comparative-optimism effects. *Psychological Bulletin, 130*(5), 813. https://doi.org/10.1037/0033-2909.130.5.813.

Ciarrochi, J., Scott, G., Deane, F. P., & Heaven, P. C. L. (2003). Relations between social and emotional competence and mental health: A construct validation study. *Personality and Individual Differences*, *35*(8), 1947–1963. https://doi.org/10.1016/S0191-8869(03)00043-6

Collaborative for Academic, Social, and Emotional Learning [CASEL]. (2008). SEL assessment, tools, needs and outcome assessments. Chicago, Illinois: Collaborative for Academic, Social, and Emotional Learning

Cucinella, N., Canale, R., Iannello, N.M., Inguglia, C. & Ingoglia, S. (2022). Maternal Parenting Stress and Preschoolers' Social-Emotional Competence and Behavioural Difficulties: A Variable- and Person-Centred Approach. *Journal of Clinical & Developmental Psychology, 4*(1), 38-55. https://doi.org/10.13129/2612-4033/0110-3375

Denham, S. A., Bassett, H. H., Zinsser, K., & Wyatt, T. M. (2014). How preschoolers' social-emotional learning predicts their early school success: Developing theory-promoting, competency-based assessments. *Infant and Child Development*, 23, 426–454. http://doi.org/10.1002/icd.1840

Dinh, H.-V. T., Nguyen Phuoc, C. T., Tran, T.-A. T., Dau, M. L., & Nguyen, T. V. (2021). The Vietnamese version of the social and emotional competence questionnaire (secq): psychometric properties among adolescents. *TPM, 28*(2), 251-266. https://doi.org/10.4473/TPM28.2.7

Domitrovich, C. F., Durlak, J. A., Staley, K. C. & Weissberg, R. P. (2017). Social-Emotional Competence: An Essential Factor for Promoting Positive Adjustment and Reducing Risk in School Children. *Child Development*, 88(2), 408-416. https://doi.org/10.1111/cdev.12739

Durlak, J. A., Mahoney, J. L., & Boyle, A. E. (2022). What we know, and what we need to find out about universal, school-based social and emotional learning programs for children and adolescents: A review of meta-analyses and directions for future research. *Psychological Bulletin, 148*(11-12), 765–782. https://doi.org/10.1037/bul0000383

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82, 405-432. http://doi.org/:10.1111/j.1467-8624.2010.01564.x

Elias, M., Zins, J., Weissberg, R., Frey, K., Greenberg, M., Haynes, N., Kessler, R., Schwab-Stone, M. & Shriver, T. (1997). Promoting Social and Emotional Learning: Guidelines for Educators. Alexandria, Virginia: Association for Supervision and Curriculum Development

Espejo-Siles, R., Zych, I., & Llorent, V. J. (2020). Empathy, social and emotional competencies, bullying perpetration and victimization as longitudinal predictors of somatic symptoms in adolescence. *Journal of Affective Disorders*, *271*, 145–151. https://doi.org/10.1016/j.jad.2020.03.071

Fernández-Martín, F.D.; Moreno-Guerrero, A.-J.; Marín-Marín, J.-A. & Romero-Rodríguez, J.-M. (2022) Adolescents' Emotions in Spanish Education: Development and Validation of the Social and Emotional Learning Scale. *Sustainability*, 14, 3755. https://doi.org/10.3390/su14073755

Frey, K. S., Hirschstein, M. K., & Guzzo, B. A. (2000). Second step: Preventing aggression by promoting social competence. *Journal of Emotional and Behavioral Disorders*, 8, 102–112. https://doi.org/10.1177/106342660000800206

Ghamary, S., Kadivar, P., & Ghanbaripanah, A. (2021). Linking Social-emotional Competence Based on Positive Mood Characteristics and Self-efficacy in Emotion Regulation: Testing the Mediating Role of Social Support. *Journal of Preventive Counselling (JPC), 2*,(4), 12-24.

Goleman, D. (1994). *Emotional intelligence.* Bantam Book.

Greenberg, M. T. (2023). *Evidence for social and emotional learning in schools*. Learning Policy Institute. https://doi.org/10.54300/928.269. Found at: https://learningpolicyinstitute.org/product/evidence-social-emotionallearning-schools

Hachem, M., Gorgun, G., Chu, M-W. & Bulut, O. (2022). Social and Emotional Variables as Predictors of Students' Perceived Cognitive Competence and Academic Performance. Canadian Journal of School Psychology, 37(4), 362-384. https://doi.org/10.1177/08295735221118474

Humphrey, N., Kalambouka, A., Wigelsworth, M., Lendrum, A., Deighton, J., & Wolpert, M. (2011). Measures of social and emotional skills for children and young people: A systematic review. *Educational and Psychological Measurement*, *71*, 617-637

Im, G.W., Jiar, Y.K. & Talib, R.B. (2019). Development of preschool social emotional inventory for preschoolers: a preliminary study. *International Journal of Evaluation and Research in Education (IJERE), 8*(1), 158-164. https://doi.org/10.11591/ijere.v8.i1

Ismail, A. M. B. & Alyami, M. H. F. (2021). Deriving The Psychometric Characteristics Of An Arabized Image Of The Social And Emotional Competencies Scale Of A Sample Of Secondary School Students In Najran Region. *Turkish Journal of Computer and Mathematics Education, 12*,(7), 398-408.

Kwon, Y.-U. (2011) Effects of Social and Emotional Learning Program on Social and Emotional Outcomes and School Adjustment. Doctoral Dissertation, Gyeongsang National University, Jinju, Korea

Luo, L., Snyder, P., Huggins-Manley, A.C., Conroy, M. & Hong, X. (2021). Chinese Preschool Teachers' Implementation of Practices to Support Young Children's Social-Emotional Competence. *Early education and development, 32,*(8), 1083-1102. https://doi.org/10.1080/10409289.2020.1841594

Martinsone, B., Supe, I., Stokenberga, I., Damberga, I., Cefai, C., Camilleri, L., Bartolo, P., O'Riordan, M. R., & Grazzani, I. (2022). Social Emotional Competence, Learning Outcomes, Emotional and Behavioral Difficulties of Preschool Children: Parent and Teacher Evaluations. *Frontiers in Psychology*, 12:760782, 1-12. doi: 10.3389/fpsyg.2021.760782

Milers, J.S., Wanless, S.B. &Weissberg, R.P. (2018). Parenting for Competence and Parenting With Competence: Essential Connections Between Parenting and Social and Emotional Learning. *School Community Journal, 28*(2).

Müller, F., Denk, A., Lubaway, E., Sälzer, C., Kozina, A., Perše, T. V., Rasmusson, M., Jugovic, I., Nielsen, B. L., Rozmna, M., Ojsteršek, A. & Jurko, S. (202). Assessing social, emotional, and intercultural competences of students and school staff: A systematic literature review. *Journal Research Review, 29,*(2020). https://doi.org/10.1016/j.edurev.2019.100304

Nakamichi, K., Nakamichi, N., & Nakazawa, J. (2021). Preschool social-emotional competencies predict school adjustment in Grade 1. *Early Child Development and Care*, *191*(2), 159–172. https://doi.org/10.1080/03004430.2019.1608978

Oberle, E., Schonert-Reichl, K. A., Hertzman, C., & Zumbo, B. D. (2014). Social–emotional competencies make the grade: Predicting academic success in early adolescence. *Journal of Applied Developmental Psychology, 35(3), 138–147.* http://doi.org/10.1016/j.appdev.2014.02.004

Portela-Pino, I., Alvarinas-Villaverde, M. & Pino-Juste, M. (2021). Socio-Emotional Skills in Adolescence. Influence of Personal and Extracurricular Variables. *International Journal of Environmental Research and Public Health, 18,4811.* https://doi.org/10.3390/ijerph18094811

Poulou, M. (2019). Emotion knowledge and social and emotional competence: A preliminary study of preschool and first-grade greek students. *Hellenic Journal of Psychology, 16,* 22-42. https://doi.org/10.26262/hjp.v16i1.7889

Qayyum, A. & Hussain, S. (2019). Effect of Scaffolding on Social and Emotional Learning (SEL) of Elementary School Students. *Journal of Social Sciences and Humanities, 27,* (1).

Sadida, N. & Triman, A. (2018). The benefit of islamic faith education to enhance children social and emotional skills. *Jurnal Pendidikan Islam 4*(2), 103-115. http://doi.org/10.15575/jpi.v4i2.1863

Schonmoser, C., Karwath, C. & Gnambs, T. (2022). Parent and Teacher Assessments of Social-Emotional Competence in Three-Year-Old Children: Does Sibling Status Matter?. *Journal of Psychoeducational Assessment, 40*(5), 621-633. https://doi.org/10.1177/07342829221077503

Soland, J., Rimm-Kaufman, S. E., Kuhfeld, M. & Ventura-Abbas, N. (2022). Empirical benchmarks for changes in social and emotional skills over time. *Child Development*, 93(4), 1-16. https://doi.org/10.1111/cdev.13741

Song, Y., & Kim, S. (2022). Effects of a Social and Emotional Competence Enhancement Program for Adolescents Who Bully: A Quasi-Experimental Design. *International Journal of Environmental Research and Public Health, 19* (7339). https://doi.org/10.3390/ijerph19127339

Supriatna, E., Eva, N. & Andayani, S. (2022). How is the description of teacher's social interaction on social emotional learning?. *Psychology Research on Education and Social Sciences, 3*(1), 19-24.

Taylor, R.D., Oberle, E., Durlak, J.A. & Weissberg, R.P. (2017). Promoting Positive Youth Development Through School-Based Social and Emotional Learning Interventions: A Meta-Analysis of Follow-Up Effects. *Child Development, 00*, (0), 1-16. https://doi.org/10.1111/cdev.12864

Temircan, Z. (2022). Assessment of Executive Functioning and Social Emotional Learning among Adolescents. *Psikiyatride Güncel Yaklaşımlar-Current Approaches in Psychiatry 14*(1), 286-292. https://doi.org/10.18863/pgy.1172105

Totan,T (2018). Ergenlerde sosyal ve duygusal öğrenme ölçeğinin geliştirilmesi. Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 48:41-58.

Wirajaya, G., Suganda, L.A. & Zuraida, Z. (2019). Indonesian students emotional competencies and their English academic achievement. *Journal of Education and Learning 13(2),* 163-169. https://doi.org/10.11591/edulearn.v13i2.12160

Yoder, N. (2014). *Self-assessing social and emotional instruction and competencies: A tool for teachers*. Washington, DC: American Institute for Research.

Zhou, M., & Ee, J. (2012). Development and validation of the social-emotional competence questionnaire (SECQ). *The International Journal of Emotional Education*, 2, 27-42.

Zuraida, P.H. & Suganda, L.A. (2021). Indonesian pre-service teachers' mindfulness, social emotional competence, and academic achievement. *International Journal of Evaluation and Research in Education (IJERE), 10*,(4), 1176-1184. https://doi.org/10.11591/ijere.v10i4.21272

Zych, I., Ortega-Ruiz, R., Muñoz-Morales**,** R. & Llorent V. J. (2018). Dimensions and Psychometric Properties of the Social and Emotional Competencies Questionnaire (SEC-Q) in youth and adolescents. *Revista Latinoamericana de Psicología*, *50*(2).