EDITORIAL BOARD

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FOREWORD

Dear Readers, dear Colleagues!

Year 2021 is nearing its end and it is the time to evaluate what we have succeeded in this year, but we also think about fields, in which we would like to achieve something new. That is what we are doing now.

Several interesting manuscripts have been submitted to the Editorial Office, new authors from all parts of the world have found us, and what is important, they have focused on new topics from a range of scientific fields, within which they have discussed educational issues. Thanks to the comments and recommendations by our independent peer-reviewers, we can offer high quality papers. We also have new, precious Editorial Board Members from the EU, but also from outside it.

The Editorial Office of Acta Educationis Generalis has prepared its third issue in year 2021, containing eight studies. What do their authors focus on?
Osman Solmaz - the author of the first study entitled The Role of a Writing Center in Academic Writing Socialization of Second Language Graduate Students - examined how second language graduate students are socialized to use academic language to participate effectively in their academic communities by employing Weidman, Twale, and Stein's (2001) framework for higher education. Overall, it was concluded that the developmental processes into academic writing in second language were non-linear, dynamic, and multimodal.

As Petra Trávníčková claims in the study The View of Student Teachers on the Teacher's Profession, currently, teaching is no longer seen only as a job, but it is perceived as a profession. As during their university studies, student teachers are at the beginning of their professional careers, their attitudes, values, and principles are still evolving and changing. While in the first year, student teachers focus more on the importance of childhood, their own practical experience and a teacher's influence on a child's life; in the last year of bachelor´s study, the emphasis is on the teacher's personality, teaching professionalism and on the teacher as a learner. By her paper, the author provides evidence that university education for kindergarten teachers is important, and it most likely influences their future work. Not only student teachers' views change significantly during their university studies, but also the focus moves from their practical experience to the didactic theory, and it also comes to shift from focusing on the personality of teachers to their abilities.

Subitizing - a quick apprehension of the numerosity of a small set of items - is dealt with by Derya Can in the specifically oriented paper Different Types of Subitizing Activity: A Teaching Experiment with Preconservers. She used the method of an experiment for presenting subitizing, which is consistently utilized to support early number understanding. Perceptual subitizing is the innate ability to recognize less than five items without consciously using other mental or mathematical processes. Conceptual subitizing, which requires higher-level abilities, means perceiving the quantities as groups and performing a mental process on them. The author claims that research on conceptual and perceptual subitizing indicates some limitations about the activities regarding the children's early number development. In the experimental process, it was observed that the participating children rely on the colour of items, the gap between items, and symmetrical aspects of items when perceptually subitizing, but they could not manage to transition their subitizing activity from perceptual to conceptual subitizing. The study indicates that children's subitizing skills were closely related to their number conservation development and it was found out that subitizing activities are perceptually limited. To make the transition from perceptual subitizing to conceptual subitizing, children should have more experiences with subitizing activities, particularly mathematical games containing subitizing categories, which may provide better support for children's number understanding.

The literature review by Yanyue Yuan and Linhui Wu presents research on intergenerational relationships and intergenerational learning in urban China and is entitled A Scoping Review on Intergenerational Learning in Urban China. The authors provide an overview of 117 journal papers on intergenerational learning published in Chinese between the years 2006-2020, and identify common themes, theoretical frameworks, and empirical research in this field. As the world ages, it comes to changes in family structures and the way how generations communicate between each other. While research on intergenerational relationships and intergenerational learning have started as early as in the 1960s and 1970s in North America and Europe, little is known about scholarly discussions in this field in China. Almost all studies set their focus on grandparenting, and emphasis is often placed on how grandparenting affects young children's growth, with little attention given to its influences on grandparents. Research on intergenerational interactions beyond family settings is almost non-existent and therefore, several recommendations for future studies are offered at the end of the paper.

Cahit Aytekin in the study Making the Pedagogical Elements Used by Prospective Mathematics Teachers Visible in Teaching: Scenario Writing Activities assumes that the scenarios written by teacher candidates in order to teach a certain subject can give them an opportunity to think deeply. In the study, it was investigated whether script writing is an effective tool to make

pedagogical elements visible in the prospects of mathematics teachers. The author concluded that - in general - script writing activities are very useful in teacher training. The data obtained from both scenarios revealed that pedagogical elements constructed during performing scenario writing activities become concrete in the minds of the prospective teachers.

Parents' attitudes towards the introduction of compulsory pre-school education a year before the child begins school are dealt with by Jana Majerčíková and Soňa Lorencová in the empirical study The Attitudes of Parents towards the Introduction of Compulsory Pre-School Education in Slovakia. In the research, two key concepts were dealt with - the obligation of educating children before they begin primary school and parents' attitudes. Children's parents attributed appropriate importance to compulsory education a year before children begin primary school and appreciated its importance for their child's subsequent education. They slightly disagreed with the academic focus of pre-school education. It would be very useful for further research to survey parents who are not mainstream and children who appear disadvantaged when starting nursery school, chiefly due to the attitude of these parents.

The relationship between digital citizenship levels of information and communication technology in teacher candidates and their user behaviours and habits in the digital world is in the centre of attention of our authors from Turkey Ali Geriş and Nesrin Özdener in the paper The Illusions on Digital Citizenship: What We Know and What We Do? The presented experimental work provides one of the first investigations into a deeper understanding of misconceptions, problems, and sub-dimensions of digital security, digital health, digital rights and responsibilities, digital law, digital etiquette, and digital commerce. Overall, this study strengthens the idea that there are problems in the concept of digital citizenship and its sub-dimension. As a result of the research, although the digital citizenship levels of the participants were measured to be very good, it was determined that there are inconsistencies with their behaviours and habits during the use of digital technologies in six of the nine sub-dimensions. In three sub-dimensions, the obtained data were relatively consistent. The authors discuss the possible causes of the digital citizenship misconceptions experienced by teacher candidates and suggestions were made for future studies.

Obed I. Ojonta, Jonathan E. Ogbuabor, Peace N. Ojonta, Anthony Orji, & Onyinye I. Anthony-Orji, in their paper entitled Employment Status and Educational Achievements in Universities: Evidence from Southeast Nigeria, point out that Nigeria is one of the developing countries facing the challenge of low level of academic achievement by employees in the university system, which in turn has grave implications for the overall performance of the Nigerian university system in terms of efficient work. They adopted a robust and stratified

sampling technique to select 4,122 employees in selected federal universities in the southeast of Nigeria and used structural questionnaire and binary logistic regression to analyse the effect of employment status on academic achievement in South East Nigeria. The findings show that the employment status negatively and significantly influences the academic achievement of employees in Nigerian universities. To ensure providing more efficient services at universities, employees should be continuously motivated so that they can strive for higher educational attainments. As the study was carried out federal universities in Nigeria, it is expected to expand the study to cut across both private, and state universities in Nigeria for effective and efficient comparison among the universities found in southeast geopolitical zones.

Dear Readers, we have filled the capacities of this issue of Acta Educationis Generalis. We offer you many interesting and unique papers by which we would like to capture your attention, motivate you to read and write further research studies.

On behalf of the Editorial Office, I wish you good prosperity and let's start the New Year with paece in our hearts and in good health all over the world.

Viola Tamášová
Editor-in-Chief

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The Role of a Writing Center in Academic Writing Socialization of Second Language Graduate Students

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Abstract:
Introduction: The present study aims to investigate second language graduate students' academic writing socialization in relation to their experiences at writing center in North American higher educational context. The study documents how graduate students are socialized to use academic language in order to participate effectively within their academic communities by employing Weidman, Twale, and Stein's (2001) framework for Graduate and Professional Student Socialization.
Methods: The data is collected through semi-structured interviews with five graduate students who had experience visiting writing center to receive support for their academic writing. The data was analyzed based on the tenets of thematic analysis, which followed an iterative process.
Results: It was revealed that second language graduate students' reasons for visiting the Campus Writing Center included their educational background, field of study, and their first language(s). It was also shown that all participants expected revision on their grammatical errors as well as feedback on global areas such as idea development and organization during their visits. Furthermore, the analysis indicated that the participants gained both positive and negative experiences from the tutoring sessions, while it was found that writing center was not the only resource our participants relied on for the development of their academic writing.
Discussion: There are various factors influencing and contributing to second language graduate students' development of writing socialization within academic community. It is a challenging task for students from other educational and cultural backgrounds to adapt and socialize into new environments, especially in the academic community of higher education. Therefore, the support from writing service and writing development programs/workshops that are tailored to the specific needs of second language graduate students would be one helpful resource to help them go smoothly through the process of second language academic writing

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socialization. Given that second language graduate students generally benefited from a strong supervision and supportive feedback, and appreciated them as reported in the literature, it is also important to survey international students' academic enculturation experiences periodically in terms of areas such as writing, speaking and participation in scholarly activities, faculty mentorship and offer feedback-support to overcome issues reported by students.

Limitations: The number of participants and the lack of students' academic text investigation were noted as limitations of the study. It is suggested that further research incorporates various sources of data collection such as tutor's perspectives and the analysis of participants' texts.

Conclusions: It was concluded that writing center played an important role in academic writing socialization experiences of the participants, and there were various factors influencing and contributing to their academic writing socialization. Overall, it was concluded that the developmental processes into academic writing in second language were non-linear, dynamic, and multimodal.

Key words: language socialization, academic writing, second language graduate students, writing center.

Introduction

"Socialization" is often referred as a process through which an individual needs to acquire knowledge, values, and practices of a group, organization, or community in order to become a part of them, and participate effectively within that particular community (Garrett & Baquedano-López, 2002). Informed by disciplines, such as anthropology, education, sociology, and sociolinguistics, socialization studies cover a broad range of topics including language socialization, which concentrates on language and literacy development of an individual within a particular group (Duff, 2010).

Many researchers (e.g., Gardner, 2007) point out that the graduate school experience is challenging, and the process requires students to build strong relationships with people in their academic community and improve their academic skills. Additionally, students need to adjust to the culture of their academic departments and institutions as smoothly as possible (Braine, 2002). Academic socialization can take even more time for second language (L2)/ international graduate students who may have to deal with challenges, such as sociocultural difference, previous first language (L1) education, and the level of L2 literacy. Seloni (2012) defines the group of international graduate students as a unique population and remarks on the adaptation experiences of these students while they switch between the expected academic language and culture and their native languages and cultures. As the universities in the United States and Canada are popular destinations for international students (Anderson, 2015), the

integration of these students into academia needs to be investigated for understanding the dynamics of a successful academic enculturation and experience overall.

Informed by the studies of language socialization and academic discourse socialization, the current study employs Weidman, Twale, and Stein's (2001) framework for graduate and professional student socialization. The academic discourse socialization experiences of second language graduate students are investigated through a multiple-case study. The study concentrates on the writing center at a large Southwestern university in the United States as a venue for academic writing socialization (AWS) of these students. It aims to explore the reasons for visiting the writing center, and their expectations when visiting it, the impact of the center on their AWS, as well as their critiques and suggestions regarding the writing center.

1 Conceptual framework for academic socialization

Socialization is broadly defined as the process by which a child acquires the knowledge and practices that help him or her participate effectively within a particular community (Garrett & Baquedano-López, 2002). Language socialization is more specifically concerned with how novices are socialized to use language and through the use of language (Schieffelin & Ochs, 1986). Duff (2010) expressed the core theoretical premise of language socialization as the process of learning the language "through interactions with others who are more proficient in the language and its cultural practices and who provide novices explicit and (or) implicit mentoring or evidence about normative, appropriate uses of the language, and the worldviews, ideologies, values, and identities of community members" (p. 172).

Academic discourse, sometimes referred to as academic language or academic literacies, involves oral and written language and communication forms that are commonly used by academic circles in educational and professional contexts (Duff, 2010). Academic discourse socialization, on the other hand, is the process that novices experience when they enter academic institutions. It is not a static process, instead, it is dynamic, potentially complex and conflictual (Morita, 2000), multimodal (Duff, 2010), and multilayered (Seloni, 2012). Some of the factors that may characterize the socialization of graduate students include feedback of colleagues and professors, different amounts of investment of learners, sociocultural backgrounds and financial situations of the students, social positioning by oneself and others, relationship with advisor and faculty, graduate programs and available university services. Each of these factors may affect the enculturation process of each graduate student differently.

In order to gain a better understanding of graduate student socialization, it is essential to be guided by a framework designed particularly for this type of socialization. Weidman et al. (2001) adapted such conceptual model for graduate and professional student socialization, which address the implications of the

discussions raised in the literature for creating and sustaining effective graduate programs. They listed four developmental stages of graduate student socialization as part of the model: Anticipatory, Formal, Informal, and Personal (see Figure 1). The Anticipatory Stage is the time when students enroll in the program and the need for learning new roles and procedures arises. During the Formal Stage, graduate students observe older students, learn about role expectations and communicate through course material and faculty-student interactions. The Informal Stage includes learning acceptable behaviors and reacting in an appropriate manner as well as starting to feel more like a professional than a student. Finally, students become professionals and they are in search of their own identity independent from their departments in the Personal Stage. However, as the broken lines and the relationship among students, university, personal and professional communities in Figure 1 show, the process is not linear. Instead, it is highly dynamic and interactive one which takes several factors into account at various stages of graduate and professional student socialization.

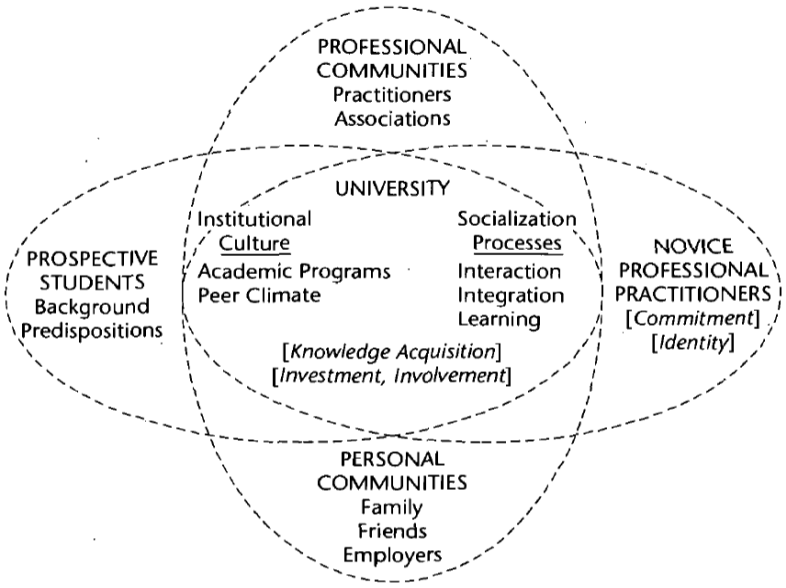

Figure 1. Conceptualization of graduate and professional student socialization (Weidman et al., 2001).

As the process is highly interactive and non-linear, students are likely to experience two stages at the same time. For instance, while experiencing the

"Informal Stage" in academic literacy socialization, they may have been going through the "Formal Stage" in oral discourse socialization. Therefore, the framework is suitable for the current study, because it places emphasis on the role of environment in academic adaptation and socialization is considered within a given context. The presence of such framework provides a clear picture for researchers and becomes a useful lens to see the processes that students go through in graduate school and the factors that are likely to shape their academic socialization process.

2 Literature review

There are a number of studies focusing on academic literacy socialization of graduate students. For example, after reviewing the scholarship on academic discourse socialization, Braine (2002) remarked that writing played a vital role in graduate studies. His research provided rich data as he integrated anecdotes of his own experiences into his study. Having been a non-native speaker graduate student himself, he shared his personal experiences and observations in order to enrich his paper. In an earlier study, Dong (1996) discovered that non-native speakers could not appropriately socialize into their academic communities by stressing that the major problematic area for three Chinese graduate students was lack of social relationship and membership within their discourse communities. Regarding plagiarism, Abasi, Akbari, and Graves (2006) determined that students' prior socialization had a major role in their understanding of the nature of knowledge and their relationship with the knowledge itself. This affected their way of using knowledge of citing and referencing earlier works in the field of studies. In another study, Nam and Beckett (2011) found that Korean graduate students' socialization into American academic writing was "difficult, frustrating, and disempowering as well as restricted by lack of coordination among resources" (para. 1). Their interviews with Korean participants showed that those students were passive users of university resources such as the writing center and research courses.

Some of the studies reported that "critical and analytical thinking" could be one of the challenges students may face depending on their background education in their native countries. For example, Morita (2000) found that Asian participants in the study felt that they lacked training in critical thinking. To illustrate, one of the participants reported that she was "lost" because of the necessity of critical thinking for successful completion of presentations and term papers and she realized that it was because of the type of education she had received in her country. Suspitsyna (2012) researched the narratives of international students and found how those narratives reflected perceptions of international graduate students towards their host departments and the ideas they developed in their home countries. In another study, Lan (2018) examined academic English socialization of non-native English-speaking graduate students in Taiwan through semi-structured interviews and reported that participants successfully

socialize into their academic communities following a period where they experience challenges including negative perceptions towards their English accents, and a lack of interaction with their Taiwanese counterparts. Investigating both native and non-native first-year doctoral students' academic writing development, Xiong (2020) reported that the similarities between the two populations were greater than their differences with respect to their developmental trajectory. Finally some of the other relevant research explored L2 writers' academic writing socialization experiences in connection with their identity constructions (e.g., Cui, 2019).

In comparison to AWS studies in general, the number of studies mainly investigating the role of writing services is limited. In one such study, Nakamuru (2010) conducted research on lexical issues in writing center tutorials with L2 writers. The research included two international and two US-educated students. It was found that US-educated learners had "superior" strengths in lexical areas compared to international students. A recent study conducted by Okuda and Anderson (2018) provided evidence for the importance of writing centers and tutors for international graduate students' English academic socialization through highlighting the experiences of three L2 Chinese graduate students at a writing center in Canadian context. Additionally, it was shown that tutors at writing centers need to be equipped enough to address the needs of international graduate students.

Even though there are studies conducted within the context of academic discourse socialization processes of second language graduate students, few of them focus solely on the their writing center visits. In the present study, I aim to fill this gap by exploring various socialization aspects of L2 graduate students who visit writing centers on campus and how it contributes to their AWS.

2.1 Researcher positionality

Before moving forward to discuss research procedures, it is critical to place myself as the researcher in the picture and what I bring to the scholarly conversation on academic writing socialization (AWS) of L2 graduate students. At the time of conducting the present study, I was in my second year of pursuing a doctoral degree in a highly interdisciplinary program as an international student in the U.S. My interest in examining the experiences of international graduate students in relation to AWS was sparked by the fact that many international students often experienced issues related to academic socialization despite the orientation programs and several other opportunities provided by the host institutions. This interest particularly stemmed from my awareness of international colleagues' writing center visits and curiosity about how such venues could explicitly or indirectly contribute to their AWS. As a graduate student who visited the writing center on campus several times in my first semester at graduate school, I identified with those experiences even more after I took a course particularly addressing issues in language socialization.

The in-depth study of this phenomenon allowed me to develop a needed theoretical perspective to explore the experiences of international students around me. Identification with my participants opened up possibilities for examining the issues pertaining to multiple aspects of socialization experiences of international students. In this study, I attempted to document the type of experiences students have while visiting writing centers on campus through semi-structured interviews which offer a closer look at one of the potential agents taking role in the phenomenon of AWS. For this purpose, I interviewed five international graduate students who benefited from the services offered by the writing center on campus. The goal of the qualitative inquiry was to reach a detailed account of student experiences through which it was possible to illustrate factors salient in students' academic writing experiences and the specific role played by writing centers. In order to demonstrate the outcomes of the study, thematic analysis (Creswell, 2007; Glesne, 2011) was preferred, which fit with the intended research purposes as it allowed me to identify patterns in the transcribed data addressing the issues covered in the study, and the process was iterative in nature and included several coding phases ensuring that the interpretations are trustworthy. I hope that certain pedagogical and curricular interventions facilitating international students' adjustment into their respective academic communities are carried into practice through studies like this.

3 Methods

3.1 Setting

This study was conducted at a large Southwestern University in the United States in the year 2013. The focus of the project was L2 graduate students' experiences at the Campus Writing Service (CWS). Since 2009, CWS has provided peer tutoring service for students in all levels and programs of study at the university. Their aim is to help students feel more confident about their writing and become successful writers by providing advice and resources on how to draft, revise, and edit all kinds of writing pieces. CWS offers two types of service: the free and the paid sessions. For the free sessions, there are 15-minute drop-in and 30-minute appointment sessions. In these free sessions, students and tutors discuss several issues of their writing projects depending on their needs such as structure, formatting, and expression. Then, if free sessions are insufficient, or if students have a larger writing project, they can make appointment for 1-hour paid session for the purpose of in-depth discussion with tutors. The fee-based session is $22 per hour, and students should send their papers to the center in advance so that the assigned tutors can go through the papers and prepare for the most efficient session.

The tutors who work at CWS are students of different programs of study at Southwestern University. There are certain qualifications that CWS requires of

their writing tutors: they must have a 3.0 overall GPA; they must be (at least) sophomores; and they must have completed the first-year writing sequence of two composition courses with a B or higher. The writing tutors of CWS participate in training every semester including large-group trainings with other tutors in other areas, as well as the training called "Tutor Enrichment", which is specific to the area of tutoring writing. This training includes sessions on the issue of effective communication with non-native speakers of English, such as sessions on multicultural and multilingual awareness in the shared training (with all tutors) and new sessions held by CWS on tutoring ESL students and tutoring graduate students.

Regarding the physical environment, there are three CWS locations around the campus. The most popular location and the one that all of the participants visited is at the old university gymnasium. Visitors who walk in will first see the reception counter where they make appointments and request walk-in tutoring sessions. Behind the reception desk are two separate rooms that serve as working spaces, one for the writing tutoring sessions, another for math tutoring. The tutoring rooms are one big open space with about six to seven rectangular tables and many chairs around them. More than one pair of student-tutors may sit and talk at the same table without a partition separating them from one another.

3.2 Participants

Five L2 graduate students participated in this study. They were recruited through e-mail, which was sent by the program coordinator of the CWS. The shared characteristics of the participants were: (1) they are international graduate students at the university; and (2) they have been to CWS for a tutoring session at least one time. Participants have diverse backgrounds and programs of study ranging from Second Language Acquisition and Teaching to Soil, Water, and Environmental Science (See Table 1 below). The information regarding gender, academic level, academic department, country of origin, first language, age, length of stay in the United States, and the graduate socialization stage of the participants based on Weidman et al.'s (2001) framework is summarized in Table 1. Pseudonyms are used instead of the participants' real names. In addition to the table, the descriptions of participants' background relating to their writing process, length/types of text they brought to CWS, as well as their initial information about the service at CWS are discussed in detail below. It is important to note that this multiple-case study was deemed to be exempted from Institutional Review Board for the Protection of Human Subjects. Pseudonyms are used in order to ensure participants' confidentiality in this study and their information were protected as part of ethical research practice.

Table 1

Participants' background information

Participant	*Gender*	*Academic level*	*Academic department*	*Country of origin / L1*	*Age*	*Length of stay in the U.S.*	*Graduate Socialization Stage*
Carisa	female	MA	Portuguese and Spanish	Venezuela/ Spanish	30s	5 years	Informal
Carlos	male	PhD	Center of Higher Education	Mexico/ Spanish	26	2 years	Formal and Informal
Fatima	female	PhD	Second Language Acquisition and Teaching	Saudi Arabia/ Arabic	28	2 years	Formal and Informal
Nadia	female	PhD	Second Language Acquisition and Teaching	Pakistan/ Urdu	28	4 years	Informal
Kali	male	MA	Soil, Water, and Environmental Science	Indonesia/ Indonesian	27	9 months	Formal

Carisa is a graduate student in Hispanic Literature Program under Portuguese and Spanish Department. She first came to the U.S. from Venezuela to be a babysitter in New York City before enrolling in an academic program at the Southwestern University. This is her last semester in the master's program, and she has been to CWS several times every semester when she needs help with her English papers. The papers she brings to CWS are usually three to four pages in length and in various topics depending on the courses she takes. She knew about the service at CWS because she also works there as a tutor in Spanish language. The interview revealed that Carisa paid a very good attention to her written texts as she mentioned that she constantly revised and edited her papers because she "wanted them to be good". She confessed that sometimes she was not satisfied with the feedback she received from a session because it was not critical enough. When that was the case, she would bring that same paper to the Center several times within the same week in order to get different perspectives from different tutors. Her frequency of visit to the CWS was high (almost weekly, and about 15-20 times per semester) compared to other participants in this study.

Carlos is a Mexican doctoral student in Higher Education program at the Center for the Study of Higher Education. He first came to the United States with a Summer Research Program that brought students from Latin America to conduct research at the Southwestern University. He found out about the service provided at CWS during his second semester from his cohort. The texts he brought to the center were varied in length, from three to ten pages, and were in topics relating to science and education. Like Carisa, Carlos takes his writing seriously and goes through multiple drafts to refine his papers. He usually edits

the work by himself and sometimes asks his friend who is a native speaker of English for help. After that, if he feels that it is not sufficient, he visits the writing center to seek additional assistance. His frequency of visits to the center was parallel with his writing assignments. He visited the CWS five to six times per semester.

Nadia is a Pakistani first year doctoral student in Second Language Acquisition and Teaching program. She worked as a Fulbright Language Teaching Assistant at the University of Texas at Austin for two semesters before coming to the Southwestern University. She received her master's degree in English Literature and Linguistics in her home country. Nadia has been to CWS five to six times in the past two academic semesters in order to seek help revising her research paper. She found out about the CWS service from her colleague who recommended that the service could help improve her writing quality as well as the writing style. Regarding her writing process, Nadia also constantly revises and edits her draft according to the suggestion she receives from the center.

Fatima is a second year doctoral student in Second Language Acquisition and Teaching program. She is originally from Saudi Arabia where she received her first master's degree in Linguistics. She then obtained her second master's degree in TESOL (Teaching English to the Speakers of Other Languages) at a large university in California. She moved to the current location and started her Ph.D. program in the year 2011. Unlike three of the participants mentioned above, Fatima went to CWS only one time upon the recommendation of her friend who is pursuing a bachelor's degree at the same university. She brought a two-page reflection paper to the center for one of her classes and she did not find the service as helpful as she expected. Later, she started to go to the writing development program offered by the university and she liked it. The reasons and information about her experience at CWS are discussed in the findings.

Kali is an Indonesian student who received Fulbright Scholarship to pursue his master's degree in Soil, Water, and Environment Science Department. He is in his second semester and he has never been to the U.S. before. Similar to other participants, he heard about the service at the writing center from his roommate. He first went there for a revision of his five-page research paper in the field of science and continued to go for various writing assignments. Kali believes that writing multiple drafts before submitting his papers is necessary, and he tries to write at least three drafts before submission. During his writing process, he edits and revises his works by himself as well as seeking additional help from his friends and the service at CWS. He visited the center approximately once in a month, and four to five times per semester.

From the descriptions of each participant, one can see that apart from being international graduate students, who have been to CWS, they also shared other common characteristics. One is the fact that they all heard about the tutoring session at CWS from their friend, classmate, roommate, or cohort, all in their academic community. Additionally, all of the participants, no matter what their

level of L2 academic literacy is, are dedicated writers who pay good attention to their writing. They all go through multiple processes of drafting, revising, and editing in order to create polished texts they feel confident about. Apparently, this is the one main reason they went to CWS to seek additional help to improve their works. In turn, advice and suggestions they received from the center also familiarize them with the process of multiple drafting to improve their papers.

3.3 Data collection and analysis

Semi-structured interviews with five international graduate students were conducted utilizing Glesne's (2011) suggestions for the interview protocol. I wrote while-interview notes and post-interview reflection, which informed the data analysis afterwards. Interview questions were based on their academic writing socialization in relation to their Campus Writing Service (CWS) experiences. Some examples of the main interview topics included the following: the quality of writing center services, resources to develop academic writing, expectations for visiting writing center, type of writing support needed. During the interviews, I set a conversational tone with participants to make it a "distance-reducing experience" (Glesne, 2011, p.134) as it provided a relaxed environment in which I could listen to the participants without judgment and encourage them to share as much information as possible. Face-to-face interviews took about 25-40 minutes at a quiet location of participant's choice over a period of one month. They were recorded using a digital recording device. Participants were encouraged to share their opinions through expression of lived experiences they had before, during, and after visiting CWS. The recordings were transcribed verbatim following the completion of each interview session.

Later, I and a colleague, who was familiar with the research, independently coded the transcriptions to see what themes emerged from them by conducting a thematic analysis (Glesne, 2011). Each data set was carefully read several times in search of emergent and salient themes. The process of data categorization was iterative and featured several coding phases, which was in line with Creswell's (2007) data analysis spiral. Following the initial coding, sub-themes within individual interviews were compared collectively. As a result, categories emerging from the data were extrapolated and collapsed into three central themes which were shared across interviews.

Given the nature of a qualitative inquiry, research questions of the present study were exploratory and tentative in the beginning, yet it provided me "a tool for articulating the primary focus of the study" (Agee, 2019, p. 433). The initial plan was to provide a rich account of international students' academic socialization experiences through their pre- and post-visit writing drafts to analyze rhetorical differences across their works, as well as the perspectives of the tutors and the tutor trainer at the CWS. However, the emergent process of focusing questions led me to the specific data of students' perspectives itself which could potentially contribute knowledge to the field of academic socialization. As a

result, the following research questions were formed; a) What are the second language graduate students' reasons for visiting the writing center and their expectations from it?, b) What kind of experiences do the second language graduate students have at the writing center in relation to their academic writing socialization?, c) What are the perspectives of second language graduate students towards visiting writing centers?

4 Findings and discussion

After engaging in the full complement of thematic analysis procedures outlined by Glesne (2011), I developed four main themes captured language socialization and L2 academic writing development of international graduate students. The first theme involves their reasons and expectations regarding their visits and experiences of being tutored at CWS. The second theme discusses the academic writing socialization of the participants in general, benefits they gained from CWS, and the other resources they use to improve their writing. Lastly, positive and negative perspectives towards visiting writing center given by the participants are included as the final theme.

4.1 Reasons for visiting a writing center and expectations

For international students, writing in L2 is always a challenging task, the task is likely to become harder when academic writing is required (Braine, 2002; Ferenz, 2005; Nam & Beckett, 2011; Poel & Gasiorek, 2012; Wang et al., 2002). Consequently, all participants shared similar feelings that they were not quite confident with their L2 academic writing and needed assistance for variety of reasons. One main reason involves their backgrounds which include their first language, educational background, and field of study. Carisa and Carlos, whose first language is Spanish, were worried that they transferred their writing style from L1 to L2. Both of them mentioned that they used different structures and organization when writing in Spanish, and they did not want their English papers to sound like they were translated from their L1. Additionally, Carlos expressed how his initial experience led him to a visit to the writing center and pointed out other reasons which played a role in his visit:

"The first time that I was there was because I had this huge article, a critique of one of my subjects. So I was so scared of not having it right because my first experience in writing wasn't that good here. I came from this background of sciences. I've never had to write that long and Spanish is different. The first time it was so different and I got not a good grade."

Not only their L1 background but also their educational background played a role in how they write. For example, Nadia received her English education mainly in the British system and therefore, she needed someone to help edit her papers to sound more like American English. In terms of the field of study, Carlos came from the background of science which usually requires shorter length of text with concise and direct writing style as partly quoted above. On

the other hand, even though Kali has always been in the field of science, he has never written scientific papers in English before. Overall, their L1 background, education, and field of study, had an influence on the way the participants develop their L2 academic writing skills which contributed to the reasons of their visit to CWS.

Participants of the study reported that they had specific aspects in writing they needed revising and also specific types of advice and suggestions they hoped to gain from the writing service. As the data showed, all of the participants sought help with their linguistic accuracy including the revision of grammar, wording, and other linguistic errors. They also looked for global area feedback including idea development, organization, coherence, and page format. In addition to linguistic feedback, some participants hoped to receive general advice and suggestions that they could apply in their academic writing development. For instance, Nadia remarked that because she came from a different culture and educational background, she did not know what the academic expectations were in the United States. Hence, she expected that the tutoring sessions could inform her about what she lacked and how to improve her writing skill in English. Interestingly, the participants not only provided information about what they expected from the service but also what they did not. The data analysis showed that most of them did not seek help with the contents of their texts from CWS, which was evidenced in Kali's following commentary:

"it [the service] is really helpful for me because they fix my all grammatical error [sic], but for the content itself, the content of my paper, they cannot give me more suggestion because it is not their field."

For Carisa, because she knew that the tutors might not know the content or the topics of her papers, she usually told them in the beginning of the sessions what her papers were about in order to avoid confusion. Similarly, Carlos stated that he expected the tutors to focus only on the mechanical aspects of his papers and not on the topics. It is clear that the participants had low expectation on content editing but very high expectation on linguistic feedback and revision from the service at CWS.

4.2 Academic writing socialization of second language graduate students

An important goal of the present research is to explore what kind of academic experiences L2 graduate students have at the CWS, and how these experiences impact their academic writing socialization (AWS). In order to have a broader picture of students' academic writing activities, resources other than CWS are also included in this section.

One of the most commonly reported issues regarding AWS were related to linguistic background of the participants and how their native language affected their English writing skills. Carisa, for example, felt that proof-reading was always needed and she added that "And if this is your second language, you'll need it more. Well, I think I need it [writing help] more than anybody else."

Both Carisa and Carlos, who speak Spanish as their first language, talked about the writing differences between Spanish and English which was briefly mentioned in the section 4.1. Carlos, who mentioned that Spanish was "different", explained the difference in this way: "In Spanish, we write and write. In English, it is different." Carlos' comment is interpreted as a reference to the difference of rhetorical aspects that are valued in various languages. While some parts of the composition, such as thesis sentence, are not required in most cases in traditional Spanish writing, it is given relatively greater importance in English. Differences like this are documented in L2 writing research through the strand of contrastive rhetoric research displaying the composition differences through L1 influences on L2 discourse, and intercultural rhetoric (Connor, 2011) proposing a multilayered context-sensitive model. Along the same line, most of the participants mentioned that they wanted their writing to "sound like English" and not to be influenced by their first language. Participants' concern over their L1 interference is seen in Carisa's comment:

"This is my main idea and this is what I want to say. How can I make this the thesis and how can I make explain this in a way that everybody will understand, and it isn't confusing, and it doesn't sound too Spanish."

The differences of writing styles among the participants resulted not only from the first language, but also from previous L2 literacy knowledge. Nadia, the Pakistani PhD student, mentioned that she had to double check her writing because of the differences between American and British English styles of writing by noting the following:

"I learnt some small but important things from these sessions which I did not know because I received my education through another system. For example, in British system we are always encouraged to add a cover page but once I did that, I was told by them [tutors] how to substitute the cover page."

Even though this is not specifically related to the writing itself, it is a good example of AWS of an international student who comes from another country with a different education system and how she tries to adapt into the requirements of the new academic environment.

In terms of communication with tutors, Carlos believed that CWS's tutors understood that there were many students from other countries, and therefore, he has never had communication problems with any of them as tutors were familiar with international students. According to the information received from the program coordinator, all of the tutors are encouraged to attend training sessions, which aim to increase their intercultural awareness and help them communicate more effectively with students of different ethnic, cultural, and linguistic backgrounds. In relation to this issue, Carisa told that her accent could be an obstacle sometimes and she felt that she had not been understood by her tutors. As she considered herself to be shy, this situation was likely to set a barrier between her and the tutor. Another remarkable comment was concerning the sensitiveness of Carisa who was afraid that the tutor might be offended by the

content of her paper about American culture. Thonus (2004) mentioned that the risk of offending was also experienced by the tutors who have to maintain politeness and increase comprehensibility when talking to students from other cultures.

As part of their academic writing socialization, the participants mentioned the impact of CWS on their writing in specific and graduate school experience in general. The contribution of CWS to the participants' academic writing was closely related to the reasons that led them to the center. Beside Fatima, who had a negative experience overall, all of the participants made use of the services they were offered at CWS. Kali and Carlos mentioned that the service really helped improve their writing qualities and grades in general. Similarly, Carisa told that "they helped me with grammar and content, such as how to make an argument stronger". This showed that her visits at CWS did improve her writing skills such as the structure of her papers. In the same fashion, Kali said that the service was really helpful in correcting grammatical errors and helped him improve sentence cohesion and idea development. Nadia voiced her opinion by specifying the areas of help she received and those she did not:

"I visited the writing center for a couple of times and it did help me in my purpose of getting my writing format edited and writing analyzed in each of those visits. But, I cannot comment on other aspects of writing like composition, paragraphing because I did not make use of it."

Her thoughts can be considered an example of L2 graduate students benefiting from CWS for specific purposes. Overall, they were satisfied with the service offered, with Fatima being an exception.

In addition to CWS as a resource, other resources that L2 graduate students used in order to increase their academic English writing skills were investigated. There were two main professional and social resources from which they sought help. This finding was in line with other studies (i.e., Ferenz, 2005; Nam & Beckett, 2011; Seloni, 2012). Professional resources included the writing development programs, writing workshops, and writing classes, whereas social resources were professors, peers, and native speaker friends. Regarding professional resources, there is another major resource for writing development that is offered by Graduate and Professional Student Council at the university beside CWS, and they regularly held workshops designed specifically for graduate students. Fatima and Kali were two participants who have attended the workshops, while Nadia expressed interest in joining the program starting next fall. On the other hand, Carisa and Carlos have never heard of this resource even though graduate student council at the university advertises their upcoming writing workshops for graduate students in their weekly electronic newsletters. Apart from those workshops for graduate students, Kali was also taking a scientific writing class in his department as well as taking an undergraduate course for writing. In terms of social resources, all of the participants expressed that they sought help from their peers who are native English speakers. Carlos,

for example, mentioned that he always consulted his native speaker friend for both content and linguistic advice, and she was very helpful in providing him detailed feedback specific to his field of study. Kali noted that he received assistance from his friends who were non-native speakers of English but were majoring in second language teaching. Professors as a resource were mentioned by Nadia who sought advice and feedback from her professors. All of the resources mentioned by the participants suggested that international graduate students tried to improve their L2 academic writing skills by reaching out to multiple resources available to them.

4.3 Perspectives towards visiting a writing center

The data analysis showed that most participants overall had a positive experience with the service at CWS. They found the service at CWS efficient and effective, and the tutors were very nice and helpful. Most participants received helpful and satisfying suggestions from the tutors and the tutoring procedures. Nadia, for instance, found her tutors very nice and helpful in going through each paragraph of her paper and providing feedback on the areas she needed:

"The tutors were nice enough to randomly go through the paragraphs and advise me if there was something that was weird in accordance with the norm."

Because of the time constraint, most participants were asked to identify aspects or sections of their writings that needed revision the most. For example, Carisa mentioned:

"I tell them that I want to focus on grammar for sure because I'm not so sure if it's making sense. And I also want to be sure that they understand the content. And if they understand the content, I want them to make my argument stronger."

When revising and editing grammatical mistakes, one strategy that the writing tutors at CWS employ is the read-aloud technique by which they have the student's read sections of their texts and then suggest what the problem areas are. This is one technique CWS recommends their tutors to use as it is a way to let the students find the errors in the texts by themselves. However, this strategy may not be the best approach for everyone. Fatima, for example, went to the CWS only one time because she did not find the read-aloud procedure helpful for her purpose. She explained the process and her feelings:

"She [the tutor] had me read it [the paper]. I had to ask her if my sentence sounds right. I don't know, but I came to have my paper corrected. If I know where my mistakes were, I wouldn't go to the writing center."

She revealed during the interview that her disappointment was likely because of her expectation regarding the way tutor tried to help her. Apparently, this situation could bring about different outcomes with other students as they may have perceived the tutoring procedures differently depending upon their expectations and individual preferences.

Apart from Fatima's negative experience, participants reported some negative aspects and critiques regarding physical environment, the tutors, the procedures, and the service qualities in general. One critique was about locations and duration of the session. As mentioned earlier, the tutoring room is one open space with several big tables. As a result, many student-tutor pairs sit at the same table and they are able to see and hear everyone else talking. This was one thing that some participants hoped CWS could improve. For instance, Carisa and Carlos felt that there could be a private space for each tutoring pair, or at least a separate table where the tutor and the student can work individually. Time constraint is another issue that was criticized by participants. Kali commented on the subject by comparing the length of each session with his paper(s) and the solution offered by the tutor:

"Well, actually…30-minute session for five-page paper is not really enough. That's why she asked me which part of the paper I really want to care about. For example, like introduction or conclusion. For me, it was the introduction part, because I had not had data yet and the paper was a research proposal."

It is clear that Kali felt that he could benefit more if the session was longer. As it was not the case, he maximized the benefit from CWS by targeting specific parts of the paper by taking the type of assignment into account. Similarly, Carisa thought that 30 minutes were not enough for her lengthy papers, but she solved this problem by visiting the center for free sessions several times within a week. Even though she knew that she could get longer session if she paid for it, she did not feel that it was necessary. Carisa explained her reasoning by drawing a comparison with her own tutorship at the CWS and stated:

"...because I'm a tutor myself so if a student needs extra time, I will offer that student extra time. And I expect them [CWS] to do the same for me. And I don't charge for doing it so I don't want them to charge me for doing this either."

In relation to the time issue, one participant, Nadia, mentioned that during her session, the receptionist approached her ten minutes before the session ended to remind her how much time she had left. This made her feel uncomfortable as if they wanted her to finish early. Nadia was the only participant experiencing this; nonetheless, it is necessary to include her critique.

Another issue that arose from the interviews was the profiles of the tutors. Because most tutors at CWS are undergraduate students from various programs of study, it is worth examining the opinions of graduate students on this issue. The analysis of themes identified that most of them were satisfied with tutors in general as they were helpful and patient with international students. Nonetheless, they felt that it would be even more effective if the tutors knew the content of their papers and were able to give suggestions on that. Most participants simply sought help from their native speaker colleagues, friends, or classmates for the content revision. Furthermore, some participants suggested that recruiting graduate tutors for graduate students would be a good idea as they could

understand the nature of graduate level writing assignments. It is perhaps best evidenced in the following statements by Carisa:

"I think that maybe the tutors should be grad students just because they know how to write a grad student paper... Because in an undergrad level paper, you can say whatever sometimes."

Her experience was that she once wrote a paper with the thesis statement in the third paragraph. She went to the CWS and the tutor did not correct her on that. Instead, her professor pointed out this problem to her after she submitted the paper. That was when she realized that it was not the way they organized ideas in English papers. Likewise, Carlos pointed out a potential problem arising from the educational backgrounds and knowledge of tutors who were not seeking a graduate degree:

"They [undergraduate tutors] didn't know how to cite. It's very important. I know now how to do it, but maybe they could have this special service for certain, for graduate students."

In connection with tutors' profile, one suggestion provided by Carlos was the need for more linguistic explanations from the tutors. From his experience, the tutors simply corrected his errors without explaining why. Therefore, he pointed out that if the tutors observe the same errors several times, they should provide further explanations so that the students know and avoid doing the same mistake. Finally, another suggestion given by the participants that is worth mentioning here was the incorporation of online editing session using technology such as "Google Drive". In the simplest sense, "Google Drive" is an online document that allows multiple users to create, share, and edit the works collaboratively in real-time. One of the participants proposed that the use of online tutoring session could be effective and convenient for students and tutors as they can work together simultaneously without going to the center.

Conclusion

This study investigated second language (L2) graduate students' academic writing socialization (AWS) in relation to their experiences at a writing center on campus. Because the number of international students enrolling in U.S. universities is increasing every year, it is important to explore their academic journeys at the U.S. institutions. A key area of L2 graduate students' socialization experiences is how they benefit from the writing center on campus as a means for their AWS.

In this study, the aim was to research a number of issues revolving around academic writing experiences of L2 graduate students. The first issue concerning L2 graduate students' reasons and expectations for visiting the CWS revealed that students' first language, education background, and field of study were among major reasons that brought them to the writing center. Regarding expectations, all of them expected revision on grammatical errors as well as feedback on global areas such as idea development and organization. However,

they did not seek advice on the contents of the papers as they understood that the tutors were from different programs of study.

Another area that the current study focused on was L2 graduate students' experiences and the impact of CWS on their academic writing socialization. The analysis indicated that the participants gained both positive and negative experiences from the tutoring sessions. Most of them found the tutors helpful and the service beneficial in improving both the quality of their texts and their general academic writing skills. On the other hand, some participants were not content with the service they received because of the unfamiliar strategy used at the center. It is also interesting to note here that CWS was not the only resource our participants relied on for the development of their academic writing. They also consulted other resources including both social (peers, professors, and native speaker friends) and professional (writing development programs and workshops) ones.

From these findings, one can see that there are various factors influencing and contributing to L2 graduate students' development of writing socialization within academic community. As Weidman et al. (2001) remarked, the developmental processes into academic writing in their second language are non-linear, dynamic, and multimodal in nature. It is a challenging task for students from other educational and cultural backgrounds to adapt and socialize into new environments, especially in the academic community of higher education. Therefore, the support from writing service and writing development programs/workshops and feedback-rich environments (Kim, 2018) that are tailored to the specific needs of L2 graduate students would be one helpful resource to help them go smoothly through the process of L2 academic writing socialization. Such programs could be integrated into First Year Education (FYE) course or programs as a recent study (Yan & Sendall, 2016) found that FYE class in their institution helped international students to familiarize themselves with academic resources and expectations, and improving their English skills. However, the content and opportunities for practice as part of such educational programs are crucial as writing courses might not be sufficient enough for students to facilitate their academic writing (Mukminin, Ali, & Ashari, 2015). In addition, digital tools and materials such as digital storytelling could be implemented for L2 graduate students to express themselves in a rather flexible format as digital storytelling allows students to "incorporate their own voices in the curriculum" (Grigsby, Theard-Griggs, & Lily, 2015, p. 65) and display their creativity while reporting the challenges they face. From a larger perspective, it is important to underscore that socio-emotional health of students should be prioritized as learners experience a transitional development and might be in need of a more stimulating environment for academic success (Mehešová, 2017).

Another implication which can be drawn from the findings is the need to periodically survey international students' academic enculturation experiences in

terms of areas such as writing, speaking and participation in scholarly activities, faculty mentorship and offer feedback-support to overcome issues, which are reported by students. As reported in the literature (Anderson, 2017; Bankier, 2019), L2 graduate students generally benefited from a strong supervision and supportive feedback, and appreciated them. Based on findings from the present study and the literature (e.g., Okuda & Anderson, 2018), writing centers at host institutions could offer tailored orientation programs addressing academic writing needs of international students regarding their adjustment into the academic culture and discipline-specific norms and expectations. Given that L2 graduate students believed receiving writing-related feedback from graduate students would be more beneficial for them, it is recommended that writing centers offer a choice for students to seek assistance from tutors who are graduate students.

In sum, it is hoped that this exploratory research project would fill the gap in the literature by bringing in three key ingredients to the picture, which are the academic socialization, L2 graduate students, and the writing center service.

There are several limitations to this study including the number of participants, as well as the absence of data from other sources, such as tutors' perspective and samples of students' texts. The suggestion of further research would be to incorporate various sources of data collection such as student-produced narratives (e.g., Anderson, 2020) during a longer period of time (e.g., Xiong, 2020). In addition, the recruitment of participants who share similar backgrounds could potentially result in more unified results that allow us to generalize the findings to the certain groups of population.

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The View of Student Teachers on the Teacher's Profession

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Abstract:
Introduction: In recent years, teaching is no longer perceived only as a job, but as a profession. The study focuses on student's view on the teacher's profession, which is important in the context of becoming a teacher. During their university studies, student teachers are at the beginning of their professional careers. Their attitudes, values and principles are still evolving.
Methods: Building on previous studies, qualitative methodology was applied. The main goals of the research were to describe the changing views of student teachers on the teacher's profession, and to compare their views in the first and third years of study. Therefore, thematic writing was chosen.
Results: The results show that the student teacher's views change significantly during their university studies. While in the first year, student teachers focus more on the importance of childhood, their own practical experience and the teacher's influence on a child's life; in the last year of bachelor´s study, the emphasis is on the teacher's personality, teaching professionalism and on the teacher as a learner can be observed. This paper can provide evidence that university education for kindergarten teachers is important and it most likely influences their future work.
Discussion: The research findings show that it is appropriate to pay attention to how views about the teacher's profession change. This could broaden the view of the development of the teacher profession concept and could also be a useful tool for modifying the content of future teachers' education.
Limitations: A certain limit of research can be sen in using one method. It would certainly be appropriate to supplement the research with interviews with participants. In my future research I will focus on this issue.
Conclusion: 1. The student teachers' views change significantly during their university studies, 2. The focus moves from their practical experience to the didactic theory. 3. There is a shift from focusing on personality of teachers to their abilities.

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Key words: teacher's professionalism, student teacher, professional view, kindergarten teacher.

Introduction

The teacher's profession is becoming an increasingly discussed topic in the professional community. In recent years, teaching has no longer been perceived only as a job, but as a profession. Professions are determined by three dimensions: professional vision, professional knowledge and professional conduct (Janík et al., 2016). These aspects are perceived as indicators of teacher professionalism. For this study, all of these aspects are important.

The education of student teachers includes the preparation of their future profession to obtain a qualification. This training is undergoing various changes in connection with the changing conception of the teacher's profession. These changes are highlighted in the concept, which should be included in the university education (Spilková, 2006).

For better understanding of the reader, in the Czech Republic with a kindergarten teacher can be (Wiegerová & Gavora, 2014):

- a graduate of a secondary vocational school focusing on the training of kindergarten teachers;
- a graduate of higher vocational education focused on kindergarten teacher training;
- a graduate of a lifelong learning program organized by a university or a school focusing on the training of kindergarten teachers;
- a graduate of a university that has accredited study programs focused on the preparation of teachers for kindergartens. As already mentioned, all our participants studied this study program.

During their university studies, student teachers are at the beginning of their professional careers. Their attitudes, values and principles are still evolving. In this context, research has been conducted with these students, which reflects changes in the view of didactic strategies in teaching (McDonald, 2016), changes in the view of themselves as a teacher (Lukášová, 2015) and also maps changes in the context of motivation to choose and stay in the profession (Wiegerová & Gavora, 2014).

Other work focused on researching the teacher's identity was also influential for this study. For example, Juklová (2013) dealt with a newly qualified teacher from the point of view of professional development. The next one, Švaříček (2011), focused attention on the narrative and social constructions of the professional identity of a teacher, and finally, Lukas and Švaříček (2007) examined the teacher's identity in the context of self-reflection. Significant for this study are also the findings of Genc, Pekic, and Genc (2014), who examined

the personality structure of a good teacher from the perspective of teaching students.

Students in our research identified some common features that also appeared in the above studies. Neville et al. (2020) point out the elements of a quality pre-service teacher mentor in their paper. However, in these previous studies, little attention was paid to how students´ perceptions of a good teacher change during their university studies. For example, Mintz (2020) measured how the attitude, knowledge and self-efficacy change between the pre-service and novice teacher year. Nevertheless, they focused on quantitative research. Therefore, the aim of this study was to understand students' views of the teacher's profession. This paper demonstrates qualitative research and the data analysis brings evidence that change in the view of the teaching profession is a significant factor.

1 Methodology

Building on previous studies, qualitative methodology was chosen. This type of design is important primarily for its ability to capture the subtle nuances of environment in a specific way. The aims were:

1. firstly, to describe the changes in the view of future teachers on the teacher's profession during two years of university study,
2. secondly, to compare their views in the first and third years of study. For this reason, the research was constituted of two phases.

First, it was necessary to find suitable research participants and obtain their consent to cooperate. The researcher first addressed a teacher who taught first-year students. When the teacher agreed to research in their class, in the end of their lesson, the researcher informed students by email. Then the researcher collected the data in classroom. In general, a selection process of participant in qualitative research can be available, incidental, or intentional. The selection of participants in this research was intentional. The selection was based on the degree of study, the age of the participants, and the field of study. The first phase involved first-year teacher students and the second phase third-year teacher students.

1.1 Characteristics of participants

The research was carried out at one Czech university, situated in Moravia. The only requirement on the participants was that they were in their first year of pedagogical studies. All of them participated in both phases of research. These students were nineteen to twenty years old (in the first stage) and twenty-two to twenty-three years old (in the second stage). The total number of participants was twenty-five.

The participants were a class of preschool full-time students studying for a bachelor degree who came from different types of secondary schools. It means that not all of them graduated from a secondary pedagogical school. Some of them were students who graduated from a business school, an industrial school,

or a school focused on tourism. At the time when the research was carried out, all of them already had experience from the first observational practices in kindergarten. In these observations, participants saw a kindergarten teacher working with children.

1.2 Methods

The chosen method was thematic writing. The participants were explained the purpose of the research and were given instructions regarding the content of thematic writing, its scope and genre. They were given the task to write an essay on the topic: What makes a good kindergarten teacher? The scope of thematic writing was not limited, but participants had a restriction on time - one hour.
The first part was carried out in 2018 among the first semester of the first year study at the university. It was conducted in a university room where all twenty-five participants were present. Each of them was given a blank piece of paper and was free to write their thoughts in one hour. During that time, the class was quiet. The participants worked at their own pace. Their writing was not interrupted by the researcher. Upon completion, they submitted their work anonymously. The length of the text was around one page in the both cases.
The second part of the research was accomplished in 2020 in the summer term of the third year students. The process of data collection was the same as in the first phase. The participants were the same as in the first part.

1.3 Data analysis

Fifty thematic writings from all twenty-five students were analysed. The same students participated in the research in the first and third years. The length of one document was about one standard page.
First, the data from the year 2018 were analysed. Then, the data collection and contextualization were performed. The data were processed in the form of a text record (transcripts of thematic writing). It was rewritten into an electronic form and analysed by the ATLAS.TI program, which is a powerful tool for the qualitative analysis of large bodies of textual, graphical, audio and video data. Subsequently, data were continuously read and coded using open coding. Following this process, significant categories were created and subsequently, sub-categories and main categories emerged. The second part of the data from 2020 were analysed in the same way.
The main categories were then interpreted and a comparison of the results was created from the first and third years of study.

2 Results

The conducted interviews produced rich data that will be interpreted in this section. Data analysis is divided into two parts. The first part introduces categories that focus on the understanding of the teaching profession by student teachers. In the first phase, the categories, which describe the teaching profession as a whole, are introduced. This incorporates everything that the participants expressed in the thematic writing. This means the work of the teacher, their practical experience, what makes a successful teacher, etc. In the second phase, attention is paid to the specific description of the teacher as perceived by the student teachers. Specifically, this section concerns, according to students teachers, which qualities make a good teacher. In both parts, the first and third year are compared and interpreted.

In data analysis, several categories were firstly created. The participants focused their attention mainly on the teacher's personality and quality of life of the children. In the thematic writing of the first year, students did not pay significant attention to the teacher's didactic strategies. On the contrary, the participants in the third year of study wrote about the organizational competencies of the teacher and the choice of appropriate teaching methods and strategies. However, these statements appeared only to a small extent in comparison to first year of study. Given that their studies focused on the teacher's educational activities, it is interesting that the importance of the teacher's personality still prevails among students. This may be due to the fact that students in the third year are already very close to the start of their profession and therefore they are considering whether they possess these prerequisites.

The following table presents the topics that emerged from the data analysis. The categories are highlighted in bold and are followed by selected representative statements from the participants (P = participant, number = number assigned to it, 1-20 - first year of study, 21-40 - third year of study). As Table 1 shows, some topics of the first and third years of study overlap. However, the quality of the content varies. Whilst students in the first year place great emphasis on their initial practical experience, in the third year this category has completely disappeared. In fact, a new category of teaching professionalism has been added. This can probably be attributed to the fact that in the third year of study students have become more focused on theory than practical experience. On the other hand, the data from the first year produced many descriptions of teacher personality types. This shows that early in study, students focus more on themselves and their own experience. They also describe the importance of childhood and children's needs. Their view of teaching does not differ significantly. Similar to the first year, in the third year students are aware of the complexity and importance of the teaching profession. In the category of "Me as a teacher," it is possible to notice certain changes in the content quality. However, in both cases, students emphasize the quality of the life of the child.

Table 1

Comparison of the themes in 1st and 3rd year of study

Participants (1st year of study)	*Participants (3rd year of study)*
The importance of childhood P3: *"Childhood is very important for the development of a person. Their personality and character are created and even if it does not seem so, children perceive everything that happens around them and often they remember certain situations for the rest of their lives."*	Teacher's personality P25: *"The teacher should be able to use common sense, have an appetite for life and still have the motivation to move and learn. They should be able to make fun of themselves and take the role of a teacher as a mission, not a profession."*
How I see the work of a teacher P11: *"The teacher should be a good role model for children in all respects. They should accept children as they are without prejudice. They should not only find what children excel in, but also support them in the area that concerns their problems and always be a helping hand to them."*	How I see the work of a teacher P32: "*The ideal teacher is one who can handle situations with a calm head, is mentally flexible and resilient. The work of a kindergarten teacher is very mentally and physically demanding."*
Teaching as a mission P4: *"Every teacher has an important task ahead of them – the development and education of our new generation."* P1: *"And although it does not seem so, I think that a child's soul is the most fragile. Therefore, we should think about that before we tell or do something to the child. In one sentence, we can change their future."*	Teaching as a mission P27: *"Over the course of three years of study, during which I had the opportunity to experience being a teacher in kindergarten, to be in contact with children and work with them, I consolidated my views, attitudes and values several times and confirmed that this choice of field was correct and that I want to carry out this mission, to be a teacher, in the following years of my life."*
Own practical experience P19: *"Unfortunately, in my observation practice, I encountered a situation where the teacher did not pay as much attention to the children as needed. This would be the case when a teacher drinks coffee while the children are playing. No controlled activity, no supervision of children, just a lot of noise and chaos."*	Teacher professionalism P31: *"It is important for the teacher to be able to ensure the healthy development of the child and for there to be experts around the child who are aware of, understand and fulfil the specifics of this stage of development."*

Me as a teacher P20: *"Through my work, I would also like to make life easier for children who do not grow up in ideal conditions, to bring them only the beautiful things that childhood has to offer. After all, childhood is about not solving any problems. From my point of view, I would like to positively stimulate children so that they are interested in developing, educating, learning to respect and be respected. My dream is for my students to walk down the street in 20 years and remember me as a good teacher."*	Me as a teacher P40: *"I will try to be the kind of teacher I wanted to have when I was a small child. I will love children, I will try not to differentiate between children, even if it is sometimes difficult, and above all I will try to educate children in a fun way and develop their abilities."*

The second phase of data implementation presents how the students describe a successful teacher. Several categories emerged at this stage: they are presented in Table 2. As the table shows, some overlap and some differences can be identified again. Participants in the first and third years agree that the teacher should be an expert and should therefore have the ability to develop and educate children to a high standard. At the same time, the teacher must be perceived as an embodiment of justice who oversees equal rights and opportunities (see Zapletal et al., 2018). Over two years of university study, their conception of the teacher as a kind, supportive, being full of love and understanding has not changed. As a result, this category is named "Teacher as an angel". Last but not least, their perception of teaching as a mission rather than a job has not changed. Whilst in the first year they often talked about the influence of the teacher on the children, in the third year a new category "Teacher as a learner" has appeared. This is a very interesting finding, which can be explained by their greater focus on one's personality and the awareness that the teachers´ principle is to teach not only others but also oneself. Students also realize that they must be a role model for the children and society as a whole. This fact does not appear in the first year, where students are aware that it is also part of the teachers' role to create a bridge between school and family. On the other hand, third-year students do not pay it attention.

Table 2

Comparison of the themes in first and third year of study

- The teacher as an expert - The teacher as the embodiment of justice - The teacher as a person influencing the child's whole life	- The teacher as an expert - The teacher as the embodiment of justice - Teacher as a learner

- The teacher as a bridge	- The teacher as a role model
- The teacher as an angel	- The teacher as an "angel"
- The teacher as a bearer of the mission	- The teacher as a bearer of the mission

The teacher as an expert

This theme presents how participants describe teacher's professionalism. The following statement gives an example of this.

P8: *"I think that a professional teacher has a real relationship with children and is aware of their responsibilities and spends a lot of their free time preparing the most varied program possible."*

In the first year of study, they refer to the diversity of activities and development of the child. On the other hand, in the third year the focus is more on the choice of appropriate methods, organizational forms and professionalism. The reason for this change may be due to the fact that after many years of study, students have realized that the teacher must approach the children individually and the didactic side of teaching has become more important. Nonetheless, even in the third year, the diversity of games and activities still prevails over the didactic side.

P29: *"The teacher should take into account the age and individual differences in the implementation of activities and evaluations, strive to implement attractive and diverse forms, methods and types of activities."*

Interesting in this context is the statement of a student who refuses to devote all her time to preparing for class.

P34: *"At the same time, I do not want to be the teacher who spends every evening at home creating activities for children. Firstly, I no longer have a place to put all the activities I have made, and secondly, I do not want the work to define me. I do not want to do a lot of extra things that won't be useful in the end."*

However, the teacher's work also includes other aspects such as creating a stimulating classroom environment and positive atmosphere, which according to participants is a reflection of a teacher's commitment.

P7: *"I am of the opinion that the overall condition, the mood of the children in the classroom is a reflection of the teacher's work."*

The teacher as a learner

The theme named "Teacher as a learner" is very interesting. This category appears only in the third year. It presents the teacher as a person who is learning all their life and strives to constantly improve and gain new qualifications. This is an important finding, as this principle is very important for teachers. As the following statements show, it is possible to see that the students:

1. plan to future themselves professionally,

P38: *"I want to go further with my studies and complete these and other courses as part of my master's studies. I want to be a teacher who does not just look after children in kindergarten, but who also tries to be supportive in many areas and is competent in doing so."*
2. consider it a feature of a successful teacher.
P25: *"A good teacher should be eager to constantly learn and move."*

The teacher as a bridge
The relationship between the teacher and the parent is very important for the development and education of the child. Research participants are also aware of this. It is the first-year students, however, who place more emphasis on this part of the teacher's work. This is evidenced by the following statements.
P11: *"The relationship between the teacher and the parent is crucial. The teacher, as well as the parent, spend a lot of time with the child and must find common ground. My parents and the teacher got along well; got involved in school events and I have beautiful memories of it. I think it's important."*
P8: *"The teacher should be able to communicate with parents. They know what's best for the child, don't they?"*
In the third year, these statements appear more sporadically and are not given such importance. This is a little bit surprising, because it is clear that the relationship between the teacher and the parent affects the child's development. It is possible that third-year students perceive this part of the profession as automatically associated with the teaching profession. In order to be able to find the exact reasons, further research would need to be done.

The teacher as a role model
Research participants are well aware that their behaviour and actions can affect the children themselves. This is also evidenced by this theme title: The teacher as a role model. This category appears only amongst third year students. First-year students do not pay much attention to the teachers' professionalism. This may be due to the fact that they do not yet have sufficient knowledge of how children learn and how important imitation learning is at this age. In the third year, however, the participants are aware of this fact. They talk not only about being a role model for children, but also about being a role model for other teachers, parents and society in general.
P31: *"First of all, I would like to be a role model for children, but also for other teachers."*
P35: *"Kindergarten teachers should be a role model for children, because they spend most of the day with them and children often take certain habits from them, also vocabulary, etc."*

The teacher as the embodiment of justice

The teacher as the embodiment of justice is perceived as an important category. This theme illustrates another part of the teaching profession, which is specific to ensuring fairness and equal opportunities. Interestingly, these statements appear in both groups examined to approximately the same extent. From this we can conclude that this category is of high importance for the students. This is evidenced by the following statements.

P7: *"Children should feel safe in kindergarten, and this is linked to the fact that the rules are followed. That is why the teacher is there to oversee it."*

P26: *"I would certainly be fair to all children. I think it is especially important. It is necessary to ensure that children do not harm each other and respect each other."*

The teacher as a person influencing the child's life as a whole

As this theme indicates, both groups realize that the teacher can influence a child for life. A particularly important finding is that students in the first year are aware of the importance of the teaching profession. This view does not change even after two years of university study, even when they are aware of the power they have. They also know how dangerous their authority can be in relation to the child. Their perception of personal responsibility is surprising. Here you can see the statements taken from the first and third year.

P17: *"It is a heavy burden that we all carry together. In certain chapters of life, it is very important to shape a personality in order to be human. We have a great responsibility and it is up to us to decide how we approach this mission."*

P34: *"Although it doesn't seem like it, I think the child's soul is the most fragile. Therefore, we should think about it before we tell or do something to the child. In one sentence, we can change their future."*

The teacher as an „angel"

As can be seen, this theme has a very unconventional name. This was chosen because the participants describe the personality of the teacher as a unique angel-like creature. From their description, it is a person who is kind, smiling, full of love and understanding. For them, a teacher is a person who is there for children throughout their existence and loves them with all the heart. It is interesting how much love one person can have in themselves, as described by the participants. The principle of love in a kindergarten classroom environment is very important for both groups of participants. In fact, for students it is the most important part of teaching. This is evidenced directly by the following statements:

P9: *"I will do everything I can to have all the children around me in my arms when entering the class."*

P36: *"In my opinion, the teacher should be listening, full of understanding, emotion and love."*

The teacher as bearer of the mission

This final theme is closely related to the previous one. Just as students describe an ideal teacher as an angelic being, they also assign them a mission. They do not just look at the teaching profession as a job. They give this profession a completely new quality - a mission. It is very interesting that they are aware of the importance of their profession. Their vision is to shape the next generation. This awareness begins in the first year of study. Perhaps, it could be one of the reasons why they wanted to become kindergarten teachers. In the third year, these statements also appear. The mission is connected with the main goal of the teacher.

P19: *"I perceive the work of a teacher as a mission where the teacher has the opportunity to shape future generations."*

P23: *"Every teacher has an important task ahead of them: development and education of the new generation. That is their mission."*

3 Discussion

The results of this study show that the view of student teachers changes significantly during their studies at university. While in the first year, the student teachers focus more on the importance of childhood, their own practical experience and the teacher's influence on child's life; in the last year of bachelor´s study, the emphasis on the teacher's personality, teaching professionalism and emphasis on the teacher as a learner can be observed.

As in the study by Genc, Pekic, and Genc (2014), the teacher's personality and their communicative skills are very important. It is also shown to some extent in the presented categories. Wiegerová and Gavora (2014) state that teaching is a mission. This was also confirmed in this study, where the principle of the teaching profession as a mission appeared both in the first and third year.

The research findings show that it is appropriate to pay attention to how the view of the teacher's profession changes among student teachers. It can be seen in the emphasis on increasing qualifications, their professional vision in relation growing requirements of the profession. A possible follow up research in this context could be with the same participants after completing their studies and starting their profession. This could turn the view of the development of the teacher profession concept and could also be a useful tool for modifying the content of future teachers' education.

Conclusion

In the Czech Republic, it is possible to teach in a kindergarten with a high school diploma. These research findings, however, prove that during university studies, students achieve new personal qualities in teaching, mature as personalities and also gain a professional outlook. Thus, the present paper can be evidence that

higher education for a kindergarten teacher has a significant importance and influence on their future work.

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Different Types of Subitizing Activity: A Teaching Experiment with Preconservers

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Abstract:
Introduction: Subitizing, a quick apprehension of the numerosity of a small set of items, is consistently utilized to support early number understanding. Perceptual subitizing is the innate ability to recognize less than five items without consciously using other mental or mathematical processes. Conceptual subitizing, which requires higher-level abilities, means perceiving the quantities as groups and performing a mental process on them. Research on conceptual and perceptual subitizing indicates some limitations about the activities regarding the children's early number development. So, MacDonald and Wilkins (2016) developed a framework that explained the types of activities that young children used while subitizing. In this framework, five sets of perceptual subitizing activity were described to explain how young children's perceptual subitizing activity changed. Besides, two types of conceptual subitizing activities were defined to explain how children's limited or flexible number understanding related to their subitizing activity. These seven different types of activities characterize the changes in children's subitizing actions. The study aims to investigate the relationship between children's number understanding and subitizing activity.
Methods: A teaching experiment was conducted with two preschool-aged children to analyze what perceptual and conceptual processes children relied upon when subitizing. The teaching experiment consisted of twenty-six sessions. The interviews were conducted to determine whether children are able to conserve numbers or not, and whether they rely on a variety of different types of subitizing activity or not. After the interviews, 26 teaching sessions were carried out with two preconserver children.
Results: In the experimental process, it was observed that the children rely on the color of items, the gap between items, and symmetrical aspects of items when perceptually subitizing. However, they could not manage to transition their subitizing activity from perceptual to conceptual subitizing. The study indicates that children's subitizing skills were closely related to their number conservation development.

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Discussion: Based on the findings from this study, for Eren and Beren, subitizing activities were found to be perceptually limited. Specifically, it was found that four types of perceptual subitizing emerged to explain how symmetry, the gap between items, color of items, and canonical patterns promoted strategies that children relied on when constructing number understanding. During the teaching experiment, although these children carried out the activities that required the separating and combining numbers and seeing the relationship between the subgroups and the composite groups, they used perceptual units in this process. The relationship between the number conservation activity and the conceptual subitizing activity requires the coordination of thinking structures related to both ordering and classification. However, it was found that the children could not move from perceptual to the conceptual subitizing.
Limitations: As all studies have some limitations, this study has, too. One of the limitations of the study is the sample size/number of participants. But teaching experiments aim to get a deep understanding, studying with a small sample is an obligation. Secondly, this study focused on some compounds of subitizing such as perceptual and conceptual ones.
Conclusion: In order to make the transition from perceptual subitizing to conceptual subitizing children should have more experiences with subitizing activities.When designing mathematical games and assessments for young children, being aware of different types of subitizing categories may provide better support children's number understanding and subitizing.

Key words: subitizing, number conservation, early math, teaching experiment.

Introduction

Subitizing is instantly perceptual apprehension and identification of the numerosity of a small group of items. In the first half of the twentieth century, researchers considered counting was an inadequate indicator of a true understanding of number, and they emphasized the importance of subitizing (e.g., Douglass, 1925). Carper (1942) stated that subitizing was more accurate than counting and influential for abstracting. In the second half of the twentieth century, educators developed different models for counting and subitizing. For some researchers, subitizing is a much more basic skill than counting and a necessary precursor to counting (Fitzhugh, 1978; Klahr & Wallece, 1976). The others stated that children mostly employ counting rather than subitizing which is defined as a shortcut to counting (Brownell, 1928; Gelman & Gallistel, 1978). Gelman and Gallistel (1978) expressed that subitizing is simply a form of rapid counting. However, questions regarding the relationship between number development and subitizing activity subsist (MacDonald, 2013). Subitizing investigations are situated primarily in the field of neuroscience and psychology

and focused mainly on the perceptual mechanisms that support subitizing activity. These studies stated that item orientation (e.g., patterned versus unpatterned items) influences activity relying upon perceptual mechanisms (Arp & Fagard, 2005; Logan & Zbrodoff, 2003). In the fields of mathematics education, it was found that subitizing activity changed as children were able to subitize sets with a larger number of items and a wider variety of orientations (Clements & Sarama, 2007; Sarama & Clements, 2009). This change was explained as children's ability to link spatial imaginary to number development. Some studies concluded that factors such as the spatial arrangement, physical size of the dots, and color of the dots affect subitizing ability (Leibovich, Kadhim, & Ansari, 2017; MacDonald, 2013, 2015; Whelley, 2002). For example, children can easily subitize in rectangular arrangements and it is followed by linear, circular, and scrambled arrangements (Beckwith & Restle, 1966). In addition, certain arrangements are easier for specific numbers. For example, children make fewer errors for ten dots than for eight with the "domino five" arrangement, but fewer errors for eight dots for the "domino four" arrangement. (Leibovich, Kadhim, & Ansari, 2017). Whelley (2002) argued that if there is a parallelism between the colors and the groups (for instance, three dots clustered are all red and two dots clustered are all black), children's subitizing skills become much more efficient. When there is no such a matching (for instance, four dots clustered have two red and two black items and three dots clustered have two red and one black item), their subitizing accuracy decreased. In addition, the performance in subitizing varies based on the gaps between the items and patterned arrangements (Logan & Zbrodoff, 2003; Mandler & Shebo, 1982).

1 Categories of subitizing

As a result of the Building Block program, two types of subitizing were described by Sarama and Clements (2009). Perceptual subitizing is the innate ability to recognize less than five items without consciously using another mental or mathematical process. Conceptual subitizing, which requires higher-level abilities, means perceiving the quantities as groups and performing a mental process on them (Clements, 1999). Sarama and Clements (2009) describe it as a child's ability to rely less on the items' orientations and more on their own number understanding. Research on the conceptual and perceptual subitizing (Clements, 1999; Sarama & Clements, 2009; Starkey & McCandliss, 2014) indicates some limitations about the activities regarding the children's early number development (MacDonald & Wilkins, 2019). MacDonald and Wilkins (2016) conducted a 22-session teaching experiment and found that different types of perceptual subitizing skills explain shifts in preschool children's abstraction process. They developed a framework that explained the types of activities that young children used while subitizing (MacDonald & Wilkins, 2016). In this framework, five sets of perceptual subitizing activity were

described to explain how young children's perceptual subitizing activity changed (Table 1). In addition, two types of conceptual subitizing activities were defined to explain how children's limited or flexible number understanding related to their subitizing activity (Table 2). These seven different types of activities characterize the changes in children's subitizing actions (Clements, Sarama, & MacDonald, 2019; MacDonald, 2013, 2015; MacDonald & Wilkins, 2016, 2019).

1.1 Five types of perceptual subitizing

MacDonald and Wilkins (2016) state that perceptual activity starts from a child's reliance on fixed and spatial patterns, and moves toward a process where units rely on their flexible and dynamic representations.

Table 1

Five types of perceptual subitizing.

Types of perceptual subitizing	*Descriptions*	*Examples*
Initial Perceptual Subitizing (IPS)	Children define the visual movement or the shape of the dots.	Children may describe seeing five dots and explain how they see it stating "because it looks like a flower."
Perceptual Subgroup Subitizing (PSS)	Children can numerically express small subgroups of two or three items, but they cannot subitize the composite group.	Children may say "I saw two and three dots." or "I saw two plus three.", but do not use this information to describe the composite group.
Perceptual Ascending Subitizing (PAS)	Children can first define clustered items as subgroups and then the composite group.	Children may first state "I saw 2 and 3 dots." and then, correctly define the total composite group.
Perceptual Descending Subitizing (PDS)	Children may first define the composite group and then, define the perceived cluster of dots as subgroups.	Children may say "I saw five because I saw two and three."
Perceptual Counting Subitizing (PCS)	Children first describe seeing one more or one less than the composite group, then, count down or up to the composite group.	Children may express what they saw as "4…..5" or "6….5".

Note: These types of perceptual subitizing are described and categorized by MacDonald and Wilkins (2016) based on the answers of the children who participated in the study (Clements, Sarama, & MacDonald, 2019).

In the Initial Perceptual Subitizing (IPS), children began by relying on their eye scans or the shape of the item orientations when subitizing (MacDonald & Wilkins, 2016). For instance, the IPS predicts that when "domino four" dots are shown to the children they may say "I saw four because there was a square." The Perceptual Subgroup Subitizing (PSS) refers to the child's ability to subitize the subgroups, but not compose these subgroups to describe the composite group (for instance, they may say "I saw 3 and 3."). Similar to the IPS in the PSS activities children rely on the clustered items but not construct a number scheme to describe the entire group. The Perceptual Ascending Subitizing (PAS) and Perceptual Descending Subitizing (PDS) are much more multidimensional than the IPS and PSS (2016). During the PAS and PDS children again use the spatial patterns, and in addition, they can (a) subitize the subgroups and then, identify the composite group (for instance, they may say "I saw 3 and 3, and there are 6 dots.") or (b) subitize the composite group, and then, identify the subgroups (for instance, they may say "I saw 6 because there were 3 and 3.") (2016). Particularly, in the (b) condition the difference between the PDS and conceptual subitizing is that children still consider the physical characteristics such as spatial patterns, symmetry, color, etc. in defining the subgroups. During the Perceptual Counting Subitizing (PCS) children subitize the subgroup and then count forward one and back one (for instance, they may say "I saw 5…..6.) (MacDonald & Wilkins, 2016). Researcher stated that when children start performing actions related to number comprehension and stop relying visually on subgroups, they begin developing conceptual processes in relation to conceptual subitizing.

1.2 Two types of conceptual subitizing

MacDonald and Wilkins (2016) defined a framework for two types of conceptual subitizing that describe how children's limited or flexible number understanding related to their subitizing activity (Table 2).

Table 2

Two types of conceptual subitizing

Types of conceptual subitizing	*Descriptions*	*Examples*
Rigid Conceptual Subitizing (RCS)	Children define seeing the composite group, regardless of the orientation and color of the items, and constantly describe a fixed subgroup when explaining how they see it.	For instance, children may tell "I saw four, and I saw 2 and 2." for a set containing four dots. Children cannot describe a set of four objects as subgroups of 1 and 3 at the same time.

Flexible Conceptual Subitizing (FCS)	Children define the composite group, regardless of the orientation or color of the items, and can define two or more subgroups in different tasks.	For instance, children may tell they saw five and explain it saying "I saw 2 and 3". For the same sequence, they may also say "I saw 2, 2, and 1."

Note: These types of perceptual subitizing are described and categorized by MacDonald and Wilkins (2016) based on the answers of the children who participated in the study (Clements, Sarama, & MacDonald, 2019).

Rigid Conceptual Subitizing (RCS) refers to the fact that children cannot describe any more than one subgroup when they are subitizing. Flexible Conceptual Subitizing (FCS), on the other hand, refers to the fact that children can describe two or more subgroups while subitizing (for instance, the subgroups of 2-2 and 3-1) (MacDonald & Wilkins, 2016). The RCS is much more basic than the FCS because in the latter type children may describe more subgroups.

In terms of the learning trajectories developed by Sarama and Clements (2009), it is assumed that subitizing skills improve over time in a process from the perceptual subitizing to the conceptual subitizing. The study aims to describe the development of the children's schemas in relation to the subitizing activity. Specifically, this present study addresses the following questions:

1. Which types of perceptual and conceptual subitizing do the preschool children rely upon?
2. How do preschool children's perceptual and conceptual subitizing develop over time?

2 Method

The constructivist teaching experiment method was used to analyze the changes that occurred in the subitizing activity of preschool children. Cobb and Steffe (2011) state that the teaching experiment offers researchers many opportunities to repeatedly test students' learning trajectories to better understand the cognitive changes in their thinking patterns. For this reason, in this study, the constructivist teaching experiment method, which enables the use of flexible activities that will respond to the change in students' mathematical thoughts, was used. There are two reasons for using the teaching experiment method in a study: developing a hypothesis (exploratory teaching) and developing a model of student thinking based on an existing hypothesis (experimental teaching) (Steffe & Thompson, 2000). The hypotheses of this study are based on the framework put forward by MacDonald and Wilkins (2016). The purpose of using the teaching experiment in the current study is the patterning of thinking models that explain the conceptual process that each child employs when subitizing. One of the important features of the teaching experiment method is that the researcher is

in the role of a teacher. The aim is to establish an interactive communication with the children through this role (Steffe, 1991). Thus, the researcher's role in a constructivist teaching experiment is described as a teacher-researcher.

2.1 Participants

In this study, participants were recruited from a preschool in the south of Turkey. Twenty children initially participated in this study. Screening interviews conducted with them to determine their ability to count, conserve numbers, and subitize item orientations composed of from two to five items. Following the interview process, four children were selected to participate in the teaching experiment based on their ability to conserve number, count, and subitize. Two of them preconserver and two of them conserver. Preconserver children, Eren and Beren, are the focus of this article to provide more insight into the relationship between subitizing activity and conservation of number. Because they were six years old and relatively older children who were lack of ability to conserve numbers and conceptually subitizing.

2.2 Screening interviews

The interviews were conducted to determine whether children are able to conserve number or not and whether they rely on a variety of different types of subitizing activity. The first clinical interviews assessed children's number conservation. In the second interviews, the children's subitizing activity and counting ability were assessed. To assess children's ability or inability to conserve number one-to-one correspondence tasks were used. In the second clinical activities, they were asked to subitize dots on the cards (Figure 1), draw what they remember and then, count five or more dots in linear and random orientations. The reason for asking the students to draw what they remember was to identify their schemas when subitizing. The reason for asking them to count the dots given in linear and random orientations was to reveal their ability to keep track of items while counting.

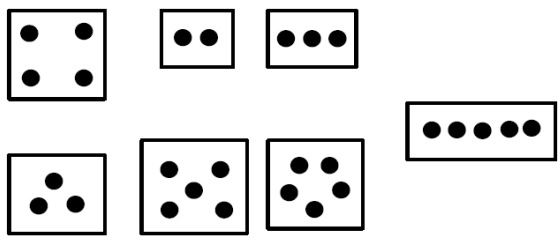

Figure 1. Subitizing cards used in the clinical interviews.

2.3 Procedure

As stated, earlier interviews were carried out with twenty pre-school children to determine: (i) whether the children conserved the numbers (ii) they relied on different types of subitizing (iii) they could keep track of items when counting or not. Interview protocols developed by MacDonald (2013) were employed.

Teaching experiment activities

The teaching experiment continued for 13 weeks, 2 hours per week. A total of 26 teaching sessions were carried out. The most basic activity was "draw what you saw". It was adapted from MacDonald and Wilkins (2019). In this activity children are asked to subitize the dots, to express verbally how many dots they see and then, to draw or use counters to show the teacher-researcher what they saw or remember. The concentration game was adapted from Clements and Sarama's (2009) activities. In this game, 6-8 cards were faced down on the table. Childrenwere asked to match the cards with the dots and the cards with the numbers taking into account the number of dots. This game was also used to match the dot sets to support children in identifying the subgroups of numbers. For instance, four dots were given in a domino four orientation, while the other card with four dots clustered two-two. Ice-cream game was developed by MacDonald and Wilkins (2016). In the game, there was an ice cream cone with six ice cream scoops. Each ice cream scoop had a different orientation of dots. The goal was to roll a dice and match dots or numerals on the dice and the dots in the ice cream scoop. When matching was justified, the ice cream scoop could be colored. For instance, in regard to six dots, there are subgroups of 2-2-2, 4-2, 5-1, and 3-3 on each ice cream scoop. Children roll the dice and match the number or dot set on the dice with the dot set on the ice cream scoop and paint the matching ice cream scoop. The child who first paints all the ice cream scoops wins the game. Digital games are also used in teaching activities. The digital game entitled Monster Mansion-Number Match on the ABCya game website (https://www.abcya.com/) was employed in the study. In addition, the digital games related to subitizing which developed by Clements and Sarama (2019) were also used. In these games, when the children correctly subitize the sets of objects they see for a short time, they approach the planet with a spacecraft.

2.4 Data analysis

Teaching experiments are based on a process that includes student actions and expressions to inform the researcher about how students make sense of specified mathematical concepts (Steffe & Thompson, 2000). In addition, the teaching experiment process offers the opportunity to explain the actions and expressions of the students in response to the researcher-teacher action and expressions. The conceptual analysis described by Glasersfeld (1995) was used to analyze the interaction between the teacher-researcher and the students. The conceptual analysis makes it possible to observe what students say and do as a result of

what teacher-researcher says and to recognize how each student's own mathematical reality changes with activities performed in the teaching experiment sessions (Steffe & Thompson, 2000). For example, when analyzing a child's response to a task the teacher-researcher attends to the actions, words, and materials rely on when justifying his/her thinking. This data provides the teacher-researcher with more information about each child's development of a number scheme. It is described as ongoing which includes critical events that enable children to define their mathematical schemes that they use when subitizing and is repeated following each teaching experiment (Powell, Francisco, & Maher, 2003). During the ongoing analysis, the focus was on which type of subitizing, namely perceptual and conceptual, the children relied on. The second step of the analysis involved a retrospective analysis. To carry out this analysis, all teaching sessions were completed and recorded on video and transcribed. In addition, the written work by the children and the notes taken by the teacher-researcher were examined and combined with the data transcribed producing the data sets. The data sets include evidence showing the changes in the children's schemas about subitizing. At the final step, the fine-grained analysis was carried out to see at which level the existing schemas were used by students when they dealt with subitizing and how this process worked (Siegler, 2007). First, the existing schemas used by children were analyzed. To see how the conceptual change in the child's thinking process occurred in each session, the actions of each child, including both verbal and gestures and facial expressions, were examined from transcribed data and video recordings. Continuous and systematic analysis were carried out to strengthen the implications regarding the changes in children's understanding, and the evidence was obtained to demonstrate the accuracy or invalidity of the inferences.

3 Findings

The findings of the study are obtained from the data collected from the interviews and the teaching experiment with two children. As stated earlier the clinical interviews targeted the children's comprehension and views about the number conservation principle and subitizing skills. The teaching activities were designed to support their transition from the level of perceptual to conceptual subitizing and to follow their development in this process. With both clinical interviews and teaching experiment activities, it was aimed to reveal the learning trajectories that the children reach and cannot reach regarding subitizing.

3.1 Screening interview-1: Counting and number conservation

In order to reveal whether children conserved numbers and they could keep track of the objects or not while counting, the related activities were carried out in the first session. As a result of the interviews, it was found that neither Eren nor Beren acquired the number conservation. When Eren was asked to count the objects in a group containing four or five objects he could not make one-to-one

correspondence. He could only count the objects correctly for the groups containing three or fewer objects. While comparing the number of objects in small sets, for example, four teacups and four teaspoons Eren counted each group separately saying that each group had four objects. However, when the spoons are moved away from each other, although Eren knew the number of both groups is four, saying that the number of spoons was more than that of cups. For the groups with four objects, Beren managed to make one-to-one correspondence and said that the number of objects was the same in both groups. However, for the groups containing five objects, she did not comprehend this fact and relied on the gap between the objects. When Beren was asked to count a group of 4-5 objects, she did not manage to make one-to-one correspondence and she often skipped counting an object or counted it twice.

3.2 Screening interview-2: Subitizing

The purpose of this activity was to determine the schemas that the children when subitizing. The children saw number cards (Figure 1) for approximately 1-2 seconds. Then they were asked to say the number of the dots on the cards, explain how they saw the dots, and draw what they saw. It was found that both Eren and Beren managed to recognize the absolute number of objects for two and three dots. When asked to explain how they saw these dots they count the numbers 1, 2, 3 using their fingers. It is an evidence for that they used perceptual subitizing. Because they both used a visual image for the numbers. When Eren was shown a card with domino four orientation and was asked the question "How many dots have you seen?", he said that there were five dots. Teacher-researcher followed up this activity with the questions, "How do you know it? Can you draw what you have seen?", he drew four dots in a linear arrangement. When he was shown five dots in the linear and pentagonal arrays, he said that there were six dots and drew a linear array containing seven dots. When he was given five dots in an X arrangement, he said that there were four dots and drew four dots. Beren also managed to subitize for the cards containing two and three dots. However, when she was shown three dots in the linear and triangular arrays, she drew all of them in a linear array. Beren managed to do subitizing for the cards containing four dots and drew what she saw using a square array. However, for the arrays containing five dots, she drew the arrays containing six, seven, or eight dots again using the linear arrays (Figure 2).

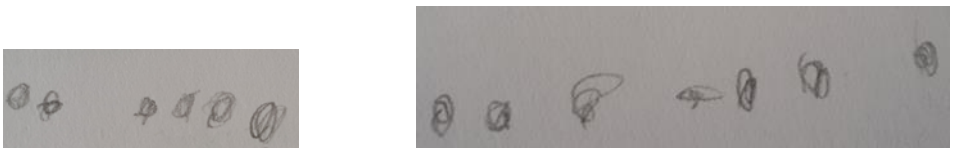

Figure 2. Beren's drawings of five-dot shapes in pentagonal and X arrays.

3.3 Analysis of the teaching experiment

In the first session of the teaching experiment, Eren was shown a card containing three dots in a triangular shape. He said that there were three dots. When he was asked to draw what he saw, he drew three dots in a triangular shape. Then, he asked to arrange three-dot-cards to understand which features of the number was employed by Eren. He arranged two cards with three dots in the triangular and linear orientations. Eren was asked to describe the similarities and differences between these two cards. He described the former as "Here there is a shape similar to the roof of the house." In the second session, Beren was shown three dots in an L array (two dots in a linear array and one dot on the right side of the bottom). Beren said that she saw three dots when she was asked to draw it, she said that it was like an "armchair" and produced the following shape with four dots (Figure 3). Beren could not explain how many dots she saw for a different orientation of three dots and tried to draw what she saw depending on the shape of the dots (Figure 4).

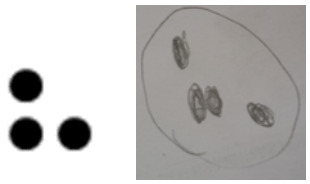

Figure3

Figure 4

The IPS activity includes observational abstractions by taking advantage of the visual motion or the shape of the dots. Eren and Beren relied upon empirical abstractions when subitizing, given responses such as "It looks like an armchair." or "It looks like a roof." and subitized them based on the shape of the dots. Another evidence of their involvement in the IPS activity is that they thought that the larger gap between items comparatively as increasing the quantity of the set. For instance, in the fourth session, Beren said that there were more dots in the orientation where the gap between the counter was larger. However, Beren managed to say that there were four dots when these dots were close to each other. In this process, it was seen that Beren opened her four fingers one by one depending on the visual image of the dots and relied on the counting action in cases where she could not subitize the objects. Beren's incorrect answer for the four dots in the square orientation where larger gaps were created between the counters showed she could not define the number of subgroups.

In a PSS activity, children can subitize for the small subgroups of two or three objects. However, they cannot subitize the entire composite group. In addition,

in identifying the subgroups several factors such as the symmetrical aspects and color of the items, the gap between the items, and the orientations of the items are important. Like in the IPS activities students whose number comprehension is not sufficiently developed subitize subgroups taking into account the properties of them (symmetry, color, position, patterns, etc.) (MacDonald, 2013). In the eighth session, Beren was shown a card with three dots in a triangular arrangement and a dot in the upper left of the triangle (Figure 5). She was asked to tell how many dots there were on the card and then to show what she remembered using the counters. Beren placed the counters to form subgroups from 1 and 4 dots. When she was given another chance to see the card for the second time in one second, she recognized that for the subgroup with three dots she used four dots, and she removed the fourth one. The dialogue in this activity is given as follows:
Showing the following card:

Figure 5

Teacher-researcher: How many dots did you see Beren?
Beren: I don't know.
Teacher-researcher: Then can you show the dots you saw on the card using the counters?
Beren made the following representation by placing four counters in a square arrangement and one counter in a separate way (Figure 6).
Teacher-researcher: Would you like me to show the card to you again?
Beren: Hı hı. (Shaking her head)
When Beren was shown it again and asked to see how many dots she saw, she took one of the counters and arranged it correctly (Figure 7).
Teacher-researcher: How many counters are there, Beren?
Beren: 3 and 1.
Teacher-researcher: Then, how many dots are there on this card?
Beren: 3 and 1.

As can be seen from the dialogues above it is evidence that Beren performed a PSS activity. Although she could tell the number of dots in the subgroups, she did not realize that she can reach the total number of dots in the set with the combination of these subgroups.

Figure 6

Figure 7

Beren was shown another card consisting of five dots in which four dots were in the square arrangement and one dot on the right side and was asked to tell how many dots she saw and to draw what she saw (session fifteen). Beren could not say that there were five dots. Instead, she drew four circles in a linear array. When Beren was given a second chance to see the card for 1-2 seconds, she recognized that there was another dot and added another dot to the linear array. Although Beren performed subitizing for the subgroups, she was not aware of the fact that she can use subgroups to describe the total composite group.
A similar observation was made for Eren. When he was given five dots in the subgroup of 2-2-1 he could not say that there were five dots. However, when he was asked to create what he saw using the counters, he produced subgroups of dots in the form of 2-2-1 (Figure 8). The symmetrical properties of the dots are very effective for the students to rely on the PSS activity and to recognize the subgroups.

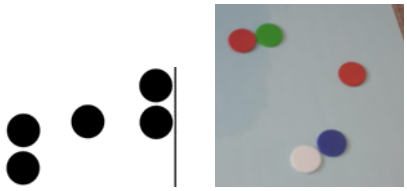

Figure 8

In PAS activity Eren and Beren described the subgroups and then the composite group. Beren employed PAS activity in the process. When the card in the figure below was shown to Beren and was asked how many she saw, she answered 2-2. When she was asked to show what she saw using the counters as illustrated in Figure 9 she produced the subgroups using two red and two blue counters. However, she could not subitize for the composite group. When asked again how many dots she saw in the group she replied she saw 2-2. She pointed out that the red and blue counters separately and said “Here there are two dots, and here there are two dots.” It shows that Beren carried out the PDS activity.

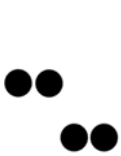

Figure 9

In the twelfth session, Beren played the camera game. In this game, Beren was shown the dots placed on the camera screen image shot and asked to tell how many dots she saw. She was also asked to draw or demonstrate what she saw or remembered using counters. A screenshot was shown to Beren in Figure 10. Following dialogue between Beren and the researcher-teacher occurred as follows:

Figure 10 *Figure 11*

Teacher-researcher: How many dots did you see?
(Beren tries to remember the dots and their orientations and opens her two fingers under the table.)
Beren: I saw five dots.
Teacher-researcher: So can you recreate the image which you see on the camera with counters? How did you see it?
Beren: Yes. (She makes the model given in Figure 11 using the counters.)
Beren: (Showing the model she produced) I saw two dots, two dots, and one dot.

Because of the gap between the dots, Beren could not subitize the total composite group. Supportive teaching sessions were held for Beren to grasp the subgroups. In this process, 2 red and 2 yellow dots are shown to Beren in a square arrangement. Beren said that she saw four dots on this card, and when asked how she saw it, she replied 2-2. She also opened her four fingers and grouped then two by two and replied, "I saw it like this." (Figure 12).


Figure 12

It shows that Beren could subitize for four dots and used the clustered items in explaining how she saw them. It can be suggested that Beren managed to perform the PDS activity because she relied on the color of the items. She could not subitize when the dots were not given in clustered subgroups.

Conclusion, discussion, and suggestions

The purpose of this study was to describe how two preconserver children's subitizing activity changed over time. Based on the findings from this study, for Eren and Beren, subitizing activities were found to be perceptually limited. Specifically, it was found that four types of perceptual subitizing emerged to explain how symmetry, the gap between items, color of items, and canonical patterns promoted strategies that children relied on when constructing number understanding. During the teaching experiment, although these students carried out the PAS and PDS activities that required the separating and combining numbers and seeing the relationship between the subgroups and the composite groups, they used perceptual units in this process. The relationship between the number conservation and the conceptual subitizing activities requires the coordination of thinking structures related to both ordering and classification. However, it was found that the students could not move to the PCS activity and the conceptual subitizing activities. Therefore, although the PAS and PDS activities were carried out to Eren's and Beren's conceptual subitizing skills, they just used the physical properties (color, symmetry, etc.) and spatial patterns (proximity/distance, symmetry, etc.) of the dots. In other words, the ability of children to describe the cluster of items as subgroups and then the composite group or to describe the composite group and then subgroups were based on physical characteristics and spatial patterns of the dots. Eren and Beren found it difficult to perform perceptual subitizing if the number of dots on the cards was more than 5, if the dots were given in the same color and if the gap between the dots were not equidistant. Cognitively, Piaget (1965) explains that for children to conserve number serial and classification thinking structures need to be coordinated simultaneously. When Eren and Beren could not subitize the

subgroups perceptually, they relied on their serial thinking structure. This finding is consistent with the previous findings of the studies with the preschool children who did not have the ability of the number conservation (MacDonald 2013, 2015). For children to structure the numbers extensively, they must have two understandings (serial thinking and classification) (Piaget, 1965). The children's understanding of the classification allows them to recognize that a number is a combination of smaller numbers or is a part of bigger numbers. Children who acquired the serial and classification thinking structure understand that the number five is a continuation of the number four and it consists of the numbers such as four and one or two and three. The ability of children to coordinate these two skills allows them to abstract numbers in many different ways (MacDonald & Shumway, 2016). Given that Eren's and Beren's classification schemas were not sufficiently developed, they had difficulty in seeing subgroups to describe the composite group. The findings of the study indicate that children's subitizing skills are closely related to their number conservation development. A similar finding was reported in the studies by MacDonald (2013, 2015). The related research (MacDonald, 2013; MacDonald & Wilkins, 2019) suggests the necessity of number conservation for the development of children's conceptual subitizing skills.

When Eren and Beren were able to engage in a perceptual subitizing activity where subgroups were described with their features such as proximity, separation, symmetry, and color, this supports their perceptual subitizing. Perceived changes in color and density allowed them to attend to the subgroups. As the findings of the study suggest the children showed improvement in regard to the number conservation and perceptual subitizing during the teaching experiment, but they did not manage to have the ability to the conceptually subitize. As a result of the practices used in the study although Eren and Beren could not have clear progress each in their subitizing skills, there occurred some changes which improved their perceptual subitizing. But considering their initial inability when counting, subitizing, and conserving numbers, their development could be considered to be quite typical. It is not clear enough whether the reason for these children's lack of conceptual subitizing is due to the lack of the psychological background of the subitizing or the lack of their experience on subitizing. To understand this, a longer-term teaching experiment should be conducted with them, and they should be provided with more experience to support their transition process from perceptual subitizing to conceptual subitizing. When designing mathematical games and assessments for young children, being aware of different types of subitizing categories may provide better support children's number understanding and subitizing. Also parents' engagement in the children's mathematics education process is necessary (Deringöl, 2019) to make children gain more experience with numbers.

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A Scoping Review on Intergenerational Learning in Urban China

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Abstract:
Introduction: The ageing world gives rise to changing family structures, as well as the way different generations interact with each other. While research on intergenerational relationships and intergenerational learning have started as early as in the 1960s and 1970s in North America and Europe, little is known about scholarly discussions in this field in China.
Purpose: This paper presents an overview of the published journal articles in Chinese on the topic of intergenerational learning in urban China, with the goal of identifying the common themes under discussion, the theoretical frameworks adopted in these studies, and empirical research in this field.
Methods: A scoping review was conducted to look for relevant journal papers published in Chinese between the years 2006-2020. We identified 117 journal papers that fit our criteria and a majority of them were found by using the key words gedai jiaoyu (education in skip-generation situations).
Conclusion: The overall quality of the published research is poor in that most authors only provided personal observations and opinions. Almost all studies set their focus on grandparenting and emphasis is often placed on how grandparenting affects young children's growth, with little attention given to its influences on grandparents. Research on intergenerational interactions beyond family settings is almost non-existent. A number of recommendations for future studies are offered at the end of the article.

Key words: intergenerational learning, grandparenting, urban China.

Introduction

The world is ageing. In 2020, 13.5% of the world's whole population is aged 60 years and over (United Nations, 2019a). "Between 2015 and 2030, the number of older persons - those aged 60 years or over - in the world is projected to grow

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by 56 per cent, from 901 million to more than 1.4 billion", and "by 2050, there will be more people aged 60 or over than adolescents and youth aged 10-24 years (2.1 billion vs. 2.0 billion)" (United Nations, 2015). This can also be reflected by the projected increase of the old-age dependency ratio (OADR) in all regions of the world, as "in 2050, the global OADR is projected to increase to 28 older persons for every 100 working-age persons" (United Nations, 2019b). In China, the ageing population is also growing fast. Life expectancy in China is now 76.7 years (Taxtor, 2021), and "the population of people over 60 years old in China is projected to reach 28% by 2040" (World Health Organizations, 2021).

Ageing societies, coupled with urbanization and other social changes, have brought about new challenges to family structures and how people of different age groups interact with each other. Among these challenges, grandparenting has drawn increasing attention, both globally (Buchanan & Rokirch, 2018) and regionally (Hank & Buber, 2009; Ko & Hank, 2014; Pan, Zhang, & Shi, 2020). Beyond grandparenting as a type of family support, research and programs with a focus intergenerational exchanges have emerged as early as in the 1960s and 1970s in North America and Europe in response to the increasing divide between generations, though early efforts were mostly prompted by problems "such as the difficult integration of immigrants, political issues related to inclusion, the new roles to be played by older persons, and the crisis affecting traditional family solidarity models." (Findsen & Formosa, 2011, p. 172). Over the years, "intergenerational learning" has become a commonly adopted term to emphasize possibilities and efforts that bring younger and older generations together in shared meaningful activities (Findsen & Formosa, 2011), which can often occur in two broad situations: the transmission of knowledge within families, and that beyond family relationships (Franz & Scheunpflug, 2016).

Arksey and O'Malley (2005) suggest that "scoping studies provide a narrative or descriptive account of available research" (p.30) and they point out the four main reasons for conducting a scoping study are "to examine the extent, range and nature of research activity; to determine the value of undertaking a full systematic review; to summarise and disseminate research findings; and to identify research gaps in the existing literature" (p. 21). Current studies (at least those published in English) on grandparenting and intergenerational relationships in general are mostly situated in western contexts. By conducting a scoping review to scan journal articles in Chinese published in China in the past 15 years that touch upon intergenerational learning in the context of urban China, we aim to provide an overview of existing research on this topic and to reveal the main viewpoints and the theoretical and conceptual frameworks adopted by Chinese scholars and practitioners, as well as the types of empirical studies that have been done.

We find it necessary to first clarify a few key words and phrases we use in this article. A number of scholars have pondered about the differences between

"intergenerational" and "multigenerational" as the two most commonly applied terms to refer to interactions, communication and activities that cover different generations. Villar (2007) believes that "intergenerational' involves "members of two or more generations" and implies "increasing interaction, cooperation to achieve common goals, a mutual influence, and the possibility of change (hopefully, a change that entails improvement)" whereas "multigenerational" is used more broadly though it does not necessarily indicate an interaction nor an influence among different generations (pp. 115-116). More recently, Watts (2017) prefers to use "multigenerational" which mirrors how things turn out to be in real life, and she challenges the phrase "intergenerational learning" as she points out that the term generation is itself embedded with dilemmas and complexity, and that "intergenerational learning" is often accompanied by false dichotomies, such as "younger versus older" or "stereotypical case of young people teaching much older people IT skills" (p. 40).

In our scoping review, we hope to focus on meaningful activities as stressed by Findsen and Formosa (2011), rather than demographic or sociological perspectives on grandparenting that have been covered by other studies (Ko & Hank, 2014; Pan et al., 2020).

1 Scoping review

1.1 Defining scope and selecting articles

In our research, we followed a similar five-step process of scoping review described by Arksey and O'Malley (2005): identifying the research questions; identifying relevant studies; study selection; charting the data; and collating, summarising and reporting the results.

Our review is guided by the following questions:

1. How have Chinese scholars approached the topic of intergenerational/multigenerational learning? And what are some of the main findings in current research and discussions on the topic of intergenerational/multigenerational learning in urban contexts?
2. What are the theories that have been employed or developed in discussing intergenerational/multigenerational learning?
3. What empirical studies have been conducted in the area of inter-/multi-generational learning?

While we set out with the commonly adopted term "intergenerational learning", we cannot find an equivalent term in Chinese that best translates "intergenerational" in the phrase *intergenerational learning*. The three most similar attributes we choose are *duodai* [多代], *kuadai* [跨代], and *gedai* [隔代]. *Duodai* [多代] is the literal translation of multigenerational; *kuadai* [跨代] implies interactions between different generations; and *gedai* [隔代] can often be used to refer to interactions between grandparents and grandchildren in skip-generation situations. Therefore, we choose *duodai*, *kuadai*, and *gedai* as the

Chinese translation of *multigenerational*, *cross-generational*, and *skip-generation* respectively.

Some scholars (Li, Kaplan, & Thang, 2020) used the term *daiji* [代际] as the translation of *intergenerational*. However, it is more appropriate to translate *daiji* as "between generations". For example, *daiji guanxi* [代际关系] as "relation between generations", *daiji chayi* [代际差异] as "differences between generations", *daiji hudong* [代际互动] as "interactions between generations". We decide not to treat *daiji* [代际学习] as an equivalent of "intergenerational learning" as it is not a commonly adopted phrase in everyday language in China.

Our review focuses on the urban context, acknowledging that skip-generation families or communities in relation to "left-behind children" in rural China has already received much scholarly attention and has been an extensively studied topic. As we set our focus on intergenerational learning as a broad topic, we also decide to leave out contents that focus on grandparenting resulting from family or social problems such as single-parent families.

As we move to the next steps of "identifying relevant studies" and "study selection", we used two main databases, CNKI (China National Knowledge Infrastructure[1]) and Google Scholar, to look for journal articles published in Chinese between the years 2006 and 2020. During our search, we found that CNKI yielded more results than Google Scholar, and that all Google Scholar search results can also be found with CNKI, so we chose CNKI as the main database when searching for relevant articles.

We used the following six phrases as our search terms by combining *duodai* [多代], *kuadai* [跨代], and *gedai* [隔代] as the attributes, in combination with *jiaoyu* [教育] (education) and *xuexi* [学习] (learning).

duodai jiaoyu [多代教育] (multigenerational education)
duodai xuexi [多代学习] (multigenerational learning)
kuadai jiaoyu [跨代教育] (cross-generational education)
kuadai xuexi [跨代学习] (cross-generational learning)
gedai jiaoyu [隔代教育] (education in skip-generation situations)
gedai xuexi [隔代学习] (learning in skip-generation situations)

Similar to the difference between education and learning, in Chinese *jiaoyu* [教育] is used more broadly and is often associated with systematic and formal education (e.g. in school settings) while *xuexi* [学习] is often applied to emphasise process and the active role of learners.

As we scanned through the articles, we found that most papers set the focus on *grandparenting*, and the Chinese term *gedai fuyang* [隔代抚养]

[1] CNKI is a widely used search engine for academic publications in Chinese. It is the largest distributor of academic resources in electronic forms in China and provides access of over 95% published academic resources in Chinese (https://scholar.cnki.net/home/about).

(grandparenting) is sometimes used interchangeably with *gedai jiaoyu* [隔代教育]. Therefore, we added *gedai fuyang* [隔代抚养] as the seventh search term. During our first round search, we identified 237 results in total with the seven search phrases, among which the majority of the articles were found by using the search term *gedai jiaoyu* (education in skip-generation situations).

Corresponding to our main goal of reviewing scholarly articles that focus on learning (or interactions at a minimal level) between different generations in urban China, we excluded the following results: 1) publications with a focus on single-parent families and left-behind children in rural areas; 2) publications or cases in Hong Kong or Taiwan or those outside China (since social policies and contexts as well as family structures can be different in these two regions); 3) undergraduate papers, graduate theses, and conference papers (for two reasons: first, we want to focus on journal papers that usually cover similar scopes; second, a quick scan of the conference papers showed that this type of publications lack academic depth and rigour).

By applying the exclusion criteria, we ended up with 153 articles and further deleted nine articles as duplicates from the two search terms (*gedai jiaoyu* and *gedai fuyang*). After three rounds of selection, we settled on 144 articles as we began our review. The search result is elaborated in Table 1.

Table 1

Criteria and results of the first two rounds search with CNKI

Search phrase	*1st round (initial results)*	*Exclusion criteria*	*2nd round (results after initial filtering)*	*3rd round (Total number of articles after deleting duplicates)*
duodai jiaoyu (multigenerational education)	0	publications with a focus on single-parent families		144
duodai xuexi (multigenerational learning)	0	Publications with a focus on left-behind children in rural area of China		
kuadai jiaoyu (cross-generational education)	0	Publications and cases in Hong Kong/Taiwan/outsi		

kuadai xuexi (cross-generational learning)	1	de China Undergraduate papers or graduate theses	
gedai jiaoyu (education in skip-generation situations)	219	Conference papers	141
gedai xuexi (learning in skip-generation situations)	0		0
gedai fuyang (grandparenting)	17		12

We acknowledge the following limitations as a result of the criteria we adopt when selecting articles. First, we have left out studies and discussions with a focus on intergenerational learning in the Chinese context published in English and other languages. Second, by focusing on urban contexts and by excluding studies that touch upon families with difficult situations, we will not be able to provide a fully comprehensive overview of all types of studies relevant to this topic. However, we believe our selected focus leads us to a reasonable and manageable scope whereas some of the above aspects have already been covered by previous reviews (Li et al., 2020) or can be more thoroughly addressed in future studies.

1.2 Charting the data

During the final round, we read through all the articles and recorded our notes on an excel form, as the process of "charting the data" (Arksey & O'Malley, 2005). In their example of a scoping study that reviews published and unpublished studies on "services to support carers for people with mental health problems", they recorded information that covers seven aspects: 1) authors, year of publication, study location; 2) intervention type, and comparator (if any), duration of the intervention; 3) study populations (carer group and care recipient group); 4) aims of the study; 5) methodology; 6) outcome measures; 7) important results.

Considering our goals and focuses, we created notes for each article that cover the following sections. First, we extracted the basic information of each paper, including article title, publication year, authors, journal name; second, we noted down key quotations and summarised the main arguments, findings and conclusions; third, we added information in relation to our research focus, including the generations featured in the article and their age range (when

available), and the English translations of the key terms (gedai jiaoyu/gedai fuyang) (when English abstract is provided). During this process, we deleted 27 articles that are not within the scope of this review (for example, articles that briefly mentioned gedai jiaoyu but with a focus on other topics such as family education, only-child family, and separation anxiety among kindergarten kids). As a result, our review analysed 117 articles in total.

In addition, as we read through the articles, we classified the articles into three broad categories based on their main contents and research methods: 1) comments; 2) literature review; and 3) empirical studies. A majority of the articles (93 out of 117) can be classified as comments, mainly consisting of the authors' opinions, comments, and suggestions without solid literature review or well-grounded arguments. We only found four literature review articles that map out current research and views from different scholars. Empirical studies only account for approximately 16% (19 out of 117) of all the articles we reviewed, which can be further broken down into four sub-categories: surveys; cases about product/experience design; cases about courses; and cases about events. Table 2 shows the distribution of the articles in each category.

Table 2

Charting the data (categorization of articles)

Article Type	*Sub-Category*	*Number of Articles*	*Total Number of Articles*
Comments	--	93	117
Literature Review	--	5	
Empirical Studies	Surveys	12	
	Cases about product/experience Design	2	
	Cases about courses	3	
	Cases about events	2	

2 Findings

2.1 Overview

Overall, the quality of the published journal articles is quite concerning. It is worth noting that peer review has only started to be adopted among Chinese journals in the past few decades. Fang, Xu, and Lian (2008) indicated that many Chinese publishing houses have been carrying out "three-level review" following the three rounds of review by the editor, the head of the editorial department and finally by the editor-in-chief. They also called attention to specific problems emerging during the peer review process, including the prevalence of single-blind (instead of double blind) review, low efficiency

caused by management systems during transition to digital platforms, selection and matching process of peer experts, and lack of clear and detailed peer-review guidelines.

Since most journals provide no clear indication of their review process, we decide to refer to journal rankings as one reference point. We resorted to two commonly applied journal indexes (often referred to as "core journals" lists): the first is the "Chinese Social Science Citation Index" (including the main list and the extended list) provided by the Institute for Chinese Social Sciences Research and Assessment, Nanjing University; the second is the "Database of Core Journals in Social Sciences" provided the by Institute of Scientific and Technical Information of China. In total, only three papers (Liu, 2017; Mu, 2017; Zhou, 2017) (published in three different journals) can be found in the two databases of core journals.

The quality of the articles can also be reflected by their lengths. We found that the length of the majority of the articles is between one to four pages. Only 12 out of the 117 articles exceed four pages (including one nine-page article and one ten-page article).

2.2 Grandparenting as a form of intergenerational education

How have Chinese scholars approached the topic of inter-/multi-generational learning? And what are some of the main findings in current research and discussions on the topic of inter-/multi-generational learning?

After reading through all the articles, we found that existing journal articles cannot help us to fully address our first research question. Many authors are actually discussing grandparenting that mainly involves childcare and daily interactions between grandparents and their grandchildren, though they tend to use the term gedai jiaoyu [隔代教育] (education in skip-generation situations). 32 articles out of the 117 articles provided an English-version abstract, among which over one-third (13 articles) used "intergeneration(al)" (in most cases, "intergenerational education" is used; one author used "intergenerational family education" and one author used "intergenerational interactive product design"); five articles used "generation-skipping education"; five abstracts used similar phrases as grandparenting (including grandparenting, grandparents' participation in family education, children reared by grandparents, grandparent-grandchild relationships, child rearing by grandparents); three articles adopted other related terms ("trans-generation education", "transgenerational education", and "cross-generation education"); and the rest of the six abstracts included inappropriate translations[2].

[2] Generation of education, interval generation education (children's upbringing interval education), grandparents education, the education between non-successive generations, family-removed education, grandparents upbringing.

On the whole, we can notice that most Chinese scholars translate gedai jiaoyu [隔代教育] into intergenerational education rather than education in skip-generation situations and that almost all articles confined their discussions on interactions between grandparents and grandchildren within the same family. To avoid confusion, we will use intergenerational education hereafter as the English translation of gedai jiaoyu [隔代教育], as it is the phrase adopted by most of the authors. Only three articles (Ding, 2019; Li & Jin, 2016; Zhu, 2019) mentioned the potential of intergenerational education beyond the same household. Both Zhu (2019) and Li and Lin (2016) mention that intergenerational education can involve both family-level and social-level activities. In her case study, Ding (2019) reflected on the effectiveness of the intergenerational learning activities that she designed for her class in a primary school, and mentioned that in the future, more efforts can be made to encourage and support mutual learning between pupils and their own grandparents as well as that between pupils and other elderly people.

Our analysis of the contents further revealed the definition and scope of "intergenerational education" adopted by the scholars, the age groups under discussion, and some of the specific interactions mentioned in the articles. Altogether, we found that 28 articles discussed or quoted definitions of "intergenerational education". All of these definitions linked "intergenerational education" to grandparenting, either explicitly or implicitly. Some authors use gedai jiaoyu as an equivalent of gedai fuyang (grandparenting), supplemented by phrases such as childcare, child-rearing, and taking care of children. In addition, most authors indicate that intergenerational education is part of family education, as either substitution or supplementation of parenting. A number of these articles introduced different degrees of grandparents' participation in childcare and education, roughly between high involvement when parents are mostly absent (in these cases grandchildren live with grandparents) and partial involvement to offer assistance when parents are busy with work. More specifically, Zhu (2013) believes that grandparenting (intergenerational education) can have different layers of meaning, and she summarises that "in a narrow sense, intergenerational education means that grandparents take main responsibility for the caring and educating their grandchildren whereas the parents only temporarily stay with their children on weekends or after being separated from their children for a longer period of time (or parents can even leave everything to the grandparents); in a broad sense, intergenerational education can be divided into the following situations: (1) the child is taken care of by grandparents and parents rarely return home; (2) the child is taken care of by grandparents during the day and by parents during the evening; (3) the child is taken care of by grandparents during week days and by parents during weekends; (4) the child is mainly taken care of by grandparents and parents occasionally show up; (5) the child is taken care of by other friends and or family members" (p. 2).

We have discerned that more attention is paid to children at a younger age. Almost half (57 out of the 117) of the articles focus on grandchildren who are preschoolers; 14 articles set their focus on children in kindergartens or primary schools (among which eight articles touch upon the age group that span across kindergarten and primary schools, and six articles focus specifically on primary school children); only six articles touch upon grandchildren beyond primary school age (among which three focus on middle school students, one across the span from young kids to adults; one from kindergarten to high school, and one on adolescent years); 37 articles discussed grandparenting in general without specifying the age group; and the rest three articles focus primarily on grandparents.

We can conclude that current studies and discussions on the topic of intergenerational education in the Chinese context are often confined to a very narrow scope. This is drastically different from the scope of "intergenerational learning" in European contexts that usually cover both intergenerational interactions within families and "learning processes between different generations in families, communities and workplaces" (Franz & Scheunpflug, 2016, p. 25).

2.3 Viewpoints on grandparenting

While we have not been able to identify any discussions of intergenerational education beyond grandparenting, the 117 articles can still provide a general overview of the main arguments and discussions around intergenerational interactions in the same households.

Almost all the articles that belong to the category of comments follow a similar structure: the author often starts by introducing the context of intergenerational education (or grandparenting) in China, followed by their opinions on its pros and cons (or advantages and challenges). The last part of the article is often dedicated to suggestions of tackling the challenges or improving the current status of grandparenting.

Many authors cited the high percentage of grandparents involved in grandparenting[3] and highlighted the trend of increasing levels of engagement of grandparents in taking care of children in China. Apart from left-over children in rural areas due to their parents' migration to big cities for employment, other reasons behind this trend include ageing society, more working mothers, two-child policy, and insufficient numbers of childcare institutions (for early years).

We summarise the mostly commonly mentioned pros and cons of grandparenting below. These views are almost unanimously shared by all the

[3] We found a number of sources frequently cited by the authors. However, we were not able to trace the original sources and some of the citations are casual references to magazine articles or online surveys. Therefore, we decided not to include the detailed statistics here.

authors who touched upon this aspect. In terms of the advantages of grandparenting, it was mentioned:

1) Grandparents often show more patience when interacting with children since they have more free and leisure time;
2) Grandparents have prior experience of child raising and their involvement can help parents to alleviate their pressure (both time-wise and finance-wise);
3) Grandparents have strong emotional bonds with their grandchildren and can help tie the whole family together;
4) Grandparents often embrace and exhibit some of the positive sides of traditional value and virtue.

Compared with advantages, many authors place more emphasis on the problems and challenges of grandparenting:

1) The educational principles and philosophies that most grandparents hold are out-dated and problematic, this can lead to unintended consequences, including
    a) Grandparents tend to spoil their grandchildren who develop bad habits and become overdependent,
    b) Grandparenting can hinder children's linguistic and social development (as grandparents have relatively small social circles),
    c) Grandparenting can inhibit children's creative capacity;
2) Grandparenting can cause conflicts in the household and children might be emotionally detached from their parents;
3) Grandparents have limited energy due to their old age and their own health situation.

Regarding children's overall cognitive growth, 32 articles mentioned that grandparents tend to prioritise safety while intervening children's development of curiosity and killing their creative potential.

It can also be noted that current discussions on grandparenting pay more attention to its influence on children's growth or family relationships, while few articles (only 12 articles) talk about how grandparenting influences grandparents themselves. Only seven article touch upon potentially positive impact, mainly how grandparenting can contribute to grandparents' physical and psychological well-being, often by alleviating their sense of loneliness and offering them a sense of achievement. Two articles (Bi & Huang, 2019; Sun, 2017) mentioned negative effects, commenting how grandparenting places pressure on the elderly in terms of their health, financial situations, and social life. Ding (2019) mentioned that her pupils' grandparents learned from their grandchildren how to use smartphones (including WeChat payment, video calls, taxi apps) and desktops (when it comes to online shopping, search engine, reading e-books and watching online TV shows). Only one article (Deng & Sheng, 2019) offers neutral comments on the distinctive needs of the elderly when using intergenerational interactive products (including their capability of using and

adapting to available materials, their distinctive aesthetic preferences, their different creative capabilities when compared to their grandchildren's generation, their attitudes towards technological products, their prior experience and knowledge, their reliance on grandchildren's feedback and how that creates the bond between the two generations). Lu, Song, Liu, Fang, & Zhang (2020) reviewed existing research in the western context that covered both positive and negative effects of grandparenting on both generations. In terms of the grandparents' generation, the author concluded that overall grandparenting can have positive effects: when it comes to physical health, grandparenting offers them more chances to engage in exercises and physical activities, though in some cases (especially when they are involved in intensive care of children under 10 years old) their health condition can be inferior compared to their peers; when it comes to their psychological well-being, grandparents can also benefit from increasing levels of self-efficacy, self-respect and sense of self-worth, though their mental health can be negatively affected when grandparenting causes lower participation in social activities (especially if they are not fully prepared for such transitions).

We identified 58 articles that involve explicit proposals to address the current challenges of grandparenting, suggesting efforts that can be made on a family-level, on an institutional level (e.g. kindergartens and primary schools), and on a social level (including communities and governments). 42 articles mentioned that within the household, parents need to take more initiatives to communicate and coordinate with grandparents so that they can best complement each other. More importantly, parents need to take a leading role when it comes to parenting and family education. In parallel to parents' efforts, grandparents can also take more actions to learn more about updated approaches and principles when it comes to educating children. 29 articles emphasised that educational institutions can play a key role. Most of the suggestions centered around activities, events and lectures that these institutions can run to educate grandparents, or to create opportunities and spaces to facilitate better intergenerational interactions. Nine out of the 29 articles focused on the responsibility of the educational institutions to pay special attention to children in skip-generation families. 17 articles discussed efforts that can be made by the government or other public organisations, ranging from general suggestions along the lines of making new policies (for example, support collaborations between different types of social organisations, setting up relevant regulations, offering financial support, providing longer parental leave) that support grandparenting at a more general level to more specific proposals that cover space (e.g. creating more public spaces for children or that help facilitate interactions between different generations), activities (e.g. designing activities and events to help grandparents and children to interact with each other or for parents and grandparents to learn from each other) and contents (offering lectures, publications, programs, online

content and consulting services that offers guidance and support around parenting, grandparenting and family education).

2.4 Theoretical and conceptual frameworks

What are the theories that have been employed or developed in discussing inter-/multi-generational learning?

As previously mentioned, the overall quality of the selected articles is relatively low, and given the short length of the articles, few authors have fully developed their arguments or supported their views with solid theoretical foundations. Kuehne and Melville (2014), in their scoping review of theories applied in intergenerational program research, coded the use of theory into four types: 1) theory within the article's literature review to provide background information to or rationale for the study and, possibly, the methodology of the study; 2) theory used in the discussion section to explain or support the program and/or study results; 3) theory used to inform program development; 4) the article suggests that theory is being used (but in fact, the article presents only a. grounded theory methods to analyse data; b. concepts/models (as theories); or c. purely theoretical discussion).

We only found 14 articles that applied theories and conceptual frameworks, which are incorporated in four different ways: 1) as background information or part of the context; 2) mentioned in the section that offers comments/ suggestions; 3) as part of the literature review; 4) as part of the methodology or research approach. The details are provided in Table 3.

Table 3

The Use of Theories and Conceptual Frameworks

Article	*Cited Theory/ Conceptual Framework/ Authors*	*Background information/ part of the context*	*Mentioned in the section that offers comments/ suggestions*	*Part of the literature review*	*Part of the methodology/ research approach*
Li, 2019	Symbiotic Theory	Y	Y		
Li & Jin, 2016	Symbiotic Theory		Y		
Wang, 2012	Symbiotic Theory		Y	Y	
Deng & Sheng, 2019	Peer Assisted Learning; Jean Piaget's Theory of Cognitive Development	Y			
Hu & Chen,	Service Design	Y	Y	Y	Y

2019					
Zhao & Chen, 2017	Participatory Curriculum Development (Rogers Alan, and Elsa Roberts Auerbach)	Y		Y	Y
Wu, 2015	Basil Bernstein's Theory of Language Codes (differentiation between elaborated language codes and restricted language codes)		Y	Y	
Yang, 2013	Erik Erickson's Stages of Psychosocial Development; Robert J. Havighurst's Six Developmental Stages	Y			
Yang & Xia	Jean Piaget's Theory of Cognitive Development; John Dewey (education is life itself); Vasyl Sukhomlynsky (children should start reading as early as possible); Lev Vygotsky's Zone of Proximal Development	Y	Y		
Wang, 2012	Erik Erickson's Stages of Psychosocial Development		Y		
Xie, 2008	Functionalism (Sociology): Herbert Spencer, Emile Durkheim, Bronislaw Malinowski, A.R. Radcliffe-Brown, Talcott Parsons,	Y	Y		

	Robert K. Merton			
Lu et al., 2020	Biological Evolution Theory; Social Exchange Theory; Family System Theory; Bourdieu's Social Reproduction Theory; Role Strain and Role Enhancement Theory			Y
Zhang, 2020	Social Work Service		Y	
Ai, 2020	Social Work Service		Y	

The theories that the authors chose vary greatly, among which educational and psychological theories are more frequently adopted, especially when it comes to discussions of children's learning (including more specific scenarios such as reading). In some articles, theories in the area of sociology and biology are borrowed to explain the rationale of grandparenting and the role it might and should play in families.

In most cases, the authors only briefly mentioned an author's name and the relevant theories or concepts as part of background information or to support the comments and suggestions section. Five articles included theory as part of the literature review, and two articles (Hu & Chen, 2019; Zhao & Chen, 2017) applied theories as both conceptual and methodological frameworks.

3 Empirical studies

What empirical studies have been conducted in the area of inter-/multi-generational learning?

We found 19 articles (see Table 2) that included empirical aspects, among which 12 articles reported results from surveys as summarised in Table 4 (Articles no.069 and no. 073 discuss the same survey).

Table 4

Articles that report survey results

Article	*Survey Date*	*Targeted Group*	*Survey Scale (number of effective surveys) and Respondents*	*Survey Focus*	*Conclusion*

Chen & Gao, 2019	NA	Students in primary schools (Year 1-4); *average age of their grandparents: 66.5	197 pairs of parents and grandparents	Demographic information, educational approaches and philosophy, perception of generation gap and actions taken	Grandparents and parents have different views and expectations when it comes to educating children. When disagreement occurs, they adopt a variety of approaches (including communicating and compromising with each other, seeking help from friends or online resources, and listening to parents' ideas) though in most cases the disputes are not settled as each insists on their own opinions.
Zhang & Liu, 2017	NA	Not mentioned (the article implies preschool kids)	93 parents and 91 grandparents	Demographic and grandparenting information, general views on early childhood family education, parents view on grandparenting, grandparents' view on children's psychological development	Grandparents' educational level is often lower than that of parents. Parents trust grandparenting but have different opinions on how to educate children and worry that grandparenting can affect parent-child relationship. Over half of the children under the care of grandparents are not as outgoing as those taken care by parents and tend to be less independent. 76.9% of the grandparents would stop children from engaging in exploratory activities. 60% of the grandparents believe language development is essential to children's

					growth, but have no idea of how they can offer help.
Liu, Xu, Guo, & Liu, 2016	NA	Kindergarten children (3-6 years old) in two kindergartens in Chuzhou, Anhui province	187 parents	Children's social development scale	Children in skip-generation family exhibit lower levels of social development than those taken care by parents (though no obvious disparity is found); grandparenting can lead to children's overdependence they tend to spoil children
Huang & Chi, 2016	2015	Not mentioned	1946 online respondents (without age focus)	Views and knowledge on grandparenting	85.2% of the respondents believe grandparenting is very common; 76.7% trace the reason to parents' employment; 42.5% of the respondents hope that regulations can be made to offer longer parental leave.
Luo, 2015; Luo & Wan, 2014 (reported on the same survey)	2013	Middle school students in four middle schools located in two cities in Henan and Guang province respectively *grandparents' age range between 53-92 (mostly between 63-74)	166 groups of students and their parents and grandparents	The survey is designed based on 12 semi-structured focus group discussions organised by head teachers with parents and grandparents respectively. Survey included Likert scale of the following aspects: family relationships, family educational	Grandparenting play a key and effective role in children's education. Overall, children are closer to their parents than grandparents; parents and grandparents share similar educational philosophy; parents score higher than grandparents in educational philosophy, contents and methods.

				philosophy, contents and methods	
Abulizi, 2016	NA	Kindergarten kids in five kindergartens in the city of Urumqi, Xinjiang province	500 grandparents	Information around grandparenting, grandparents' willingness to be involved in grandparenting, their education level and children's development	Overall, children spend more time with grandparents than with their parents, and grandparents love to take care of their grandchildren. Grandparents usually have low educational levels. Children tend to be spoiled so they tend to be more self-centered, exhibiting emotional instability, poor communication skills, aggressive behaviours and overdependence.
Zhu, Wang, & Zhang, 2013	NA	Two primary schools(Year 4-6) in Chuzhou, Anhui Province (one in rural area, and one in urban area)	266 pairs of children and their grandparents	Learning motivation diagnostic test (MAAT) scale	Grandparenting is more commonly found in rural areas. Overall children in skip-generation families show lower motivation in learning. Children's levels of learning motivation are higher in urban areas than in rural areas; grandparents' trust, encouragement, and care contribute positively to children's motivation in learning while their negligence, control, and over-constraint contribute negatively to children's motivation in learning.
Li, 2006	2003-2004	Middle schools,	11 959 parents	Demographic information,	Grandparenting is not too common among

		primary schools, and kindergartens in Shanghai		children's physical and psychological development (Likert scale), family education philosophy and actions	families with children in kindergartens, primary schools and middle schools (less than 10% and decreases as children grow up); compared to parents, grandparents hold traditional values and pay more attention to children's social opportunities; children taken care by grandparents tend to exhibit three main characters: they work harder; they are not afraid of difficulties, and they are more aggressive.
Zhao, Lin, Zhu, & Guo, 2020	NA	Five kindergartens in Ningbo, Zhejiang province	443 parents	Evaluating children's mental health status after kindergartens delayed opening due to Covid	Children's mental health status is not optimistic, especially when they are confined in households for long periods; children in households with grandparenting tend to develop higher social adaptation when returning to kindergartens.
Kong & Zhang, 2020	NA	8 kindergartens in rural areas and 6 kindergartens in urban areas in Guangyuan, Sichuan province	1205 parents	Current status of family education	98% of the children live with grandparents. Grandparents have lower educational levels and low income and often embrace outdated educational philosophy (either believing in physical discipline or tending to over spoil the children)

Cao & Ding, 2015	May-Aug 2013	Kindergartens in Liu'an city, Anhui province	1003 parents (or main caregiver)	The Conners Comprehensive Behaviour Rating Scale (CBRS), demographic information and family education	Grandparenting only account for 29.41% among all respondents (considerably lower than other areas in China); boys who are 3-6 years olds show higher rate of behaviour problems in skip-generation households and girls who are 6 years old show higher rate of behaviour problems in skip-generation households (the author interpreted this as a result of preference for male children). Grandparents often tend to prioritise childcare over education and neglect children's mental health and personality development.

It can be noted that six out of these ten surveys covered general information around grandparenting and their views on educating children, often in comparison with parents' views and children's behaviours. Three surveys have more specific focuses, mainly to evaluate how children might be affected by grandparenting, including one on social development, one on learning motivation and one on children's re-adaptation to kindergarten after quarantine/lockdown at home during the Covid-19 pandemic. One of the surveys (2020) sent out to parents has a broader focus on the status of family education. Among the ten surveys, only five included grandparents' direct responses (together with parents or children's answers themselves or both), and the others were mainly directed towards parents, so we can tell that the results from these four surveys can only partially reflect the roles and influences of grandparenting. It is inappropriate to compare these surveys as they were each designed with different purposes, and were sent to different areas in China spanning across different years targeting different age groups. We can only draw the conclusion that, generally speaking, most authors tend to focus on the differences between parents and grandparents when it comes to bringing up children and how these

differences affect children's growth and development (both physically and mentally).

Apart from surveys, we identified seven studies that cover cases in relation to grandparenting. Zhuo (2019) and Ding (2019) both cover the authors' reflection on the events they designed and hosted in their own primary schools to foster interactions between the pupils and their grandparents. Ding (2019) was teaching a class of 45 students among whom 16 students were raised by grandparents. The teacher organised a festival event during which she invited 12 grandparents (all grandmothers) to the school. She also designed activities to involve the grandparents during winter holidays with the aim to promote mutual learning between the two generations. Zhuo (2019) was teaching a class of 53 pupils (77% of the pupils are mostly taken care by grandparents and 85% of the pupils live with their grandparents) argued that traditional festivals (including the double ninth festival, winter solstice and spring festival) can be an opportunity to bring the two generations together, and she described the activities she designed for students to get to know their grandparents, and for the two generations to participate and collaborate in one activity (e.g. handcraft, cooking) and to learn from each other during the Spring Festival. While the two articles only covered the authors' own experience within one class, both articles offer detailed information of the activity design and the authors' reflections on what worked well and the lessons they learned.

The three articles, Yu and Liu (2009), Zhao and Chen (2017), and Zhu (2019) all introduced courses developed by universities and institutions in Shanghai to educate grandparents on childcare and family education, which is a common approach advocated by many scholars to address the current challenges of grandparenting: educating grandparents on the topic of grandparenting through the form of courses. From the authors' descriptions, we can tell that these courses are often taught in lecture style and usually only involve grandparents. Yu and Liu (2009) introduced one of the courses that the Shanghai University for the Elderly started to offer in Mar 2007, claiming to be the first of this kind in Shanghai. Since then, it was offered four times (each class recruited 10 students) to senior citizens by 2009 when the article was published. Both 102 and 311 are studies conducted by researchers at the Institute of Vocational and Adult Education, East China Normal University (in Shanghai). Zhao and Chen (2017) discussed how to use the participatory curriculum development approach to develop a course focusing on grandparenting that involves multiple stakeholders, including senior students, scholars, and principals of universities for the elderly (no further details of the course content were provided). Zhu (2019) provided details on how the teaching team developed the course Evidence-based Parenting and Intergenerational Learning, including the preparation stage (course description and curricula design), implementation and evaluation of the course, and reflections and thoughts on future developments.

The course (aimed at serving 20-30 senior citizens each time) was designed to offer advice to grandparents who took care of younger preschool children.

Lastly, two articles (Deng & Shen, 2019; Hu & Chen, 2019) demonstrated how design can play a role in intergenerational relationships (primarily focusing on preschool children and their grandparents). Deng and Shen (2019) adopted the perspective of mutual learning and analysed the specific needs of both generations as they interact with each other, namely physical exercises, cognitive development, emotional engagement and social development. The article briefly reviewed four design cases to illustrate how and why these designs can be intergenerationally friendly: 1) D. Ship, a public fitness equipment (designed by Huishan MA, Jiangnan university) that features coordination. Grandparents can initiate the movement of the ships by pulling the puller to exercise the upper body while children can have fun enjoying the movement of the ship. The design requires the engagement and coordination of both generations; 2) Lattjo (developed by IKEA) as a role play storytelling game that encourages family members of different ages to bring their own props and players can use the provided stories or develop their own stories. It is designed with an aim to strengthen the emotional bond between family members; 3) Five-minute finger exercise (in the form of a guidebook) as an educational game that allows grandparents to keep fit as they play games with their grandchildren with fingers (including singer songs and telling stories with fingers); 4) Grandparent-grandchild activity set (no details given) designed to improve communication between the two generations. It is a task-based card set that encourages participants to document the results as they complete each task. Hu and Chen (2019) reviewed the case of a community bookstore with the lens of service design in the context of intergenerational education. The research group started to explore the needs of elderly people and children by conducting observations and interviews in three bookstores in the city of Guangzhou, followed by in-depth interviews with 11 families living in the same neighborhood. Sketches of the floor plan design of an intergenerationally-friendly bookstore are provided at the end of the article.

In summary, current studies with empirical elements are still scarce in the field of intergenerational learning. A majority of these empirical studies are surveys (self-reported questionnaires) with a focus on demographic information and quantitative measurement. Activities and designs centering on intergenerational interactions only started to emerge as the four articles in these two sub-groups were all published in 2019.

4 Discussion

While we are not able to achieve our original goal of mapping out research published in Chinese on the topic of intergenerational learning in the context of urban China, our search terms led us to the identification of 117 journal articles with a focus on grandparenting in the context of family education. We have not

found any studies that cover the interactions between older and younger generations outside the same household, and only three authors mentioned and acknowledged the potential of further research in this aspect. We echo Li et al.'s (2020) comment that current research in the field of intergenerational relationship is only in its infancy stage and that intergenerational interactions and exchanges are "still commonly perceived within the family realm" (p. 10). Li et al.'s (2020) recent study using a web search method has shown that intergenerational programs often place more emphasis on the older generation. In comparison, our research has revealed that most discussions on grandparenting focus on cases with younger children (often in the preschool period), indicating an emphasis on childcare. While both the advantages and challenges (or problems) of grandparenting have been covered, less attention has been given to how this might influence grandparents themselves, not to mention mutual benefits that might arise during the interactions between the two generations.

In our review, we have found that the overall quality of the published journal articles is concerning and a majority of the articles we identified are written in the style of comments supported only with personal observations and suggestions without systematic review, theoretical framework or rigorous empirical research. Only 14 articles touched upon theories or conceptual frameworks, though on most occasions the authors only briefly mentioned or quoted them as background information, or to support their own comments and suggestions. We found 19 articles that include empirical elements among which 12 are quantitative surveys. The surveys were conducted in different years with different scales, targeted at different age groups in different regions in China. What we can tell from survey studies is that scholars are most interested in the differences between styles of parenting and grandparenting and how they might influence children's growth. The rest of the seven articles that include empirical elements introduce courses targeting grandparents, events with an aim to foster interactions between primary school pupils and their grandparents, and product and experience design that focus on intergenerational interactions.

We identified six articles in which the authors reflected on the landscape of current research on the topic of intergenerational education and offered suggestions on future directions. Four articles (Chen, Zhang, & Chen, 2014; Huang & Chen, 2007; Jian, Peng, Wei, & Zhi, 2013; Mao & Zhang, 2018) mentioned lack of empirical research that focus on the Chinese context, and two articles (Duan & Li, 2012, Huang & Chen, 2007) suggested that more research needs to be done to investigate the impact on grandparents. Three authors (Huang & Chen, 2007; Lu et al., 2020; Mao & Zhang, 2018) stressed the importance of focusing on the heterogeneous nature of intergenerational education. Among the six articles, two of which (Huang & Chen, 2007; Lu et al., 2020) talked about the distinction between urban and rural contexts. Meanwhile, Lu et al. (2020) call for more research that takes into consideration the possible

differences when it comes to social classes, ethnic groups, levels of grandparents' involvement, age groups of grandchildren, families with both parents and single parent, single-child families and multiple-children families. Chen et al. (2014) more specifically advocate for more studies with a focus on 4-2-1 families (four grandparents, two parents, and only one child) with younger parents (who were born after the 1980s).

Based on our findings and our awareness of the limitation of the scope of the current review, we have a number of recommendations for future research directions in the field of intergenerational learning in the Chinese context. First, it is essential to define and clarify the key terms we use and what they actually mean, especially when it comes to the Chinese version of intergenerational/ cross-generational/multi-generational. Since the Chinese language does not provide exact translations, making clear distinctions and identifying the nuanced differences between the different terms can be the first step. We also agree with Watts (2017) that as we explore intergenerational learning, we need to rethink "what we mean by education and learning" (p. 49).

Second, we strongly advocate for strengthening the rigor of research in this field by embedding theoretical frameworks throughout the studies. We agree with Kuehne and Melville's (2014) argument that researchers can make more contributions in terms of exploring "the value and composition of a uniquely intergenerational theory" (p. 337) as well as Fitzpatrick's (2019) suggestion of framing and establishing intergenerational learning as a distinctive pedagogical approach supported by more empirical research. In addition, we propose that research on intergenerational learning in the Chinese context might need to adjust and cater to its distinctive social, historical, and cultural contexts.

Third, in terms of empirical research, researchers can create more value by conducting and documenting well designed study with diversified methods instead of only sharing anecdotal stories (Jarrott, 2011; Li et al., 2020) or hosting one-off events. To achieve this, we believe it would be helpful to begin with "participant- centred education in small groups" in a non-formal learning environment, guided by a carefully designed process of planning, implementation and evaluation (Simándi, 2018). We also share the views held by other scholars (Bernhold & Giles, 2017; Li et al., 2020; Watts, 2017) that research into intergenerational relations and interactions can diversify their research methods. Ward (1999), for example, contends that in the field of intergenerational research we need to apply more qualitative research, and in particular ethnographic approaches rooted in anthropology. Elsewhere, Bernhold and Giles (2017) call for more studies that adopt longitudinal methodologies. Biesta et al. (2011) demonstrates the potential of applying narrative methods (combination of life-history and interpretative lifecourse research) when exploring interrelationships between learning, identity and agency in the lifecourse.

In the past few decades, Chinese society has undergone dramatic social changes, which have been and will be reflected in the life experiences of the past two to three generations, leading to greater disparity across the generations when studies are conducted at different life stages. Apart from developing theories of intergenerational learning, it would also be of great value to capture and track intergenerational interactions from the present moments onwards. Since existing programs are not well-documented and are often conducted as one-off events (Li et al., 2020), the most pressing task might be to carry out more action research and design research in this field to first create opportunities for possible intergenerational interactions and learning beyond the household contexts in this contemporary world when different generations have been increasingly segregated institutionally and spatially (Gratton & Scott, 2017; Vanderback & Worth, 2015).

Conclusions

As Gratton and Scott (2017) noted, longer life brings new possibilities that demand a reconceptualization of a three stage life composed of education, career, and retirement. When living a multi-stage life, they suggest that we will experience increasingly "age-agnostic" life stages and witness major changes in inter-generational dynamics. These new changes in the twenty-first century, coupled with other social changes as well as the family structure, traditional values and the unique socio-cultural context and policy in China, pose great challenges to research on intergenerational learning. That being said, these challenges bring new opportunities for studies in this broad field, calling for further scrutiny into specific contexts and topics when it comes to theoretical building and empirical research.

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Making the Pedagogical Elements Used by Prospective Mathematics Teachers Visible in Teaching: Scenario Writing Activities

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Abstract:
Introduction: In the reflective writing process, teachers make identification, information, explanation and evaluation activities (Spanneberg, 2009). It is thought that the scenarios written by the teacher candidates in order to teach a certain subject can give them an opportunity to think deeply. However, these teaching scenarios can be a valuable tool for reflective thinking in terms of educational matters such as teaching methods, pedagogy, and beliefs.
Methods: In this study, it was investigated whether script writing is an effective tool to make pedagogical elements visible in the prospects of mathematics teachers. Case study pattern, which is one of the qualitative research patterns, was used in the research. For this purpose, thirty prospective mathematics teachers who participated in the study were asked to write two scenarios. The first one is called as "car travel" and the other one is called as "triangles and similarity" scenario. Before the study, some basic frameworks were defined for both scenarios. These are explained to prospective teachers. The "car travel" scenario in this research was given within the scope of the theme which includes only two people and a limited environmental interaction. The second scenario is the triangles and the similarity scenario. In the second scenario, the role of a teacher who conducts applied and real-life education outside of school is defined.
Results: In general, it is concluded that script writing activities are very useful in training teachers. The data obtained from both scenarios reveal that the pedagogical elements constructed during the scenario writing activities become concrete in the minds of the prospective teachers.
Discussion: It is observed that prospective teachers often include the structure of teaching related to real life in their scenarios. It is stated that teaching in the context of real life increases academic success and students' interest in the lesson, and thus, the content is learned perceptibly by the students (Acar & Yaman, 2011). Another cognitive element that prospective teachers include in their scenarios is the use of available

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materials. It is noteworthy that the prospective teachers used real-life tools and materials as materials in the place chosen for the scenarios of their scripts.
Limitations: This research is limited to script texts written by thirty prospective teachers.
Conclusions: Thanks to this visibility, feedback can be given on the pedagogical elements that the prospective teacher will use in the future.

Key words: mathematics teacher education, scenario writing activity, script writing, feedback to pedagogical elements.

Introduction

Activities based on making students' thoughts visible are very important for teachers to design activities for teaching mathematics meaningfully (Lieberman, 2009). However, it has been stated that the teaching approaches of teachers who see and analyze students' thoughts have improved over time. Similarly, the efforts of faculty members who train prospective teachers to make their opinions on teaching visible are valuable in terms of giving them the opportunity to direct them. Spanneberg (2009) emphasized that teachers' thinking about their own practices is very important for their professional development. Practices that guide teachers to reflect on their teaching methods are not new (Gilbert, 1994). For example, according to Dewey (1933), reflective thinking is one of the key concepts for meaningful learning and development. Loughran and Corrigan (1995) and Schon (1983) defined reflective thinking as the process of interpreting and understanding new things by examining one's practices and thoughts. If we revise this definition for mathematics teachers, we can see it as the process of making inferences by constantly examining a teacher's own practices in mathematics classes (Spanneberg, 2009). It has been stated that using teaching portfolios containing written views about their own teaching can be very useful to lead teachers to think about their own practices (Dana & Tippins, 1998; Wolf, 1994). Many different methods can be used to prompt teachers to reflect on their own practices such as micro education, portfolio, and lesson study. In this study, it is aimed to reveal the potential of script writing activities. In this respect, it has been seen that script writing activities can be considered as a tool for prospective teachers to improve themselves.

1 Teaching scenarios and reflective writing concepts

In the reflective writing process, teachers carry out identification, information, explanation and evaluation activities (Spanneberg, 2009). In their study, Goldsmith and Shifter (1997) stated that teachers who want to change their mathematics teaching strategy usually conclude that they need to learn new terminologies to be used in teaching. This requires teachers to use language in a

different aspect. Hatton and Smith (1995) categorized reflective writing as descriptive reflective writing, dialogic reflection on dialogues and critical reflective writing. Reflective writing about dialogues is defined as making comments about the possible situations of a conversation. This process involves thinking deeply about conversations. It is thought that the scenarios written by prospective teachers at this stage to teach a certain subject can give an opportunity to think deeply. However, these teaching scenarios can be a valuable tool for reflective thinking about educational matters such as teaching methods, pedagogy, and beliefs.

2 Mathematics teacher education system in Turkey

The duration of compulsory primary education in Turkey is determined to be a total of 8 years. This primary education period is given in two stages as 4 + 4. In the first 4 years, classroom teachers are responsible for giving all courses except English. In the country, students start the first grade at the age of 6 or 7. The second stage of primary education covers the second four-year education. In this period, each course is taught by branch teachers who completed undergraduate education in that field. Mathematics lessons in middle schools are carried out by elementary mathematics teachers and mathematics lessons given in high school period are carried out by high school mathematics teachers. It is necessary to complete a 4-year undergraduate program to get primary and high school mathematics teaching undergraduate degrees. Before 2008, a 5-year education was required to get a high school teaching undergraduate degree. The curriculum of education faculties is designed by the The Council of Higher Education from a sole centre to be the same throughout the country. These curriculums were last updated in 2017 (YÖK, 2017a; YÖK, 2017b). Accordingly, primary education mathematics teaching undergraduate program consists of 240 ECTS in total. 88 ECTS of these courses are occupational knowledge, 42 ECTS are general culture and 110 ECTS are field education courses. Theoretical courses on the teaching profession consists of general educational science courses such as Educational Sociology, Educational Philosophy, Educational Psychology, Teaching Principles and Methods and Ethics in Education, Assessment and Evaluation in Education. General culture courses consist of courses such as history, foreign language, information technologies as well as some elective courses. Field education courses consist of field knowledge courses such as geometry, statistics, analytical geometry, linear algebra, and pedagogical content knowledge courses such as geometry teaching, geometry and measurement teaching, algebra teaching, probability and statistics teaching (YÖK, 2017a). High school and elementary mathematics teacher education programs are largely similar to each other except for a few subject courses (YÖK, 2017b). Prospective teachers take two courses, Teaching Practice 1 and Teaching Practice 2, in the final year in order to apply the knowledge they have learned and to give feedback to their preferences in practice. The aim of the Teaching

Practice 1 course is determined as "making observations about teaching methods and techniques specific to the field, making micro-teaching applications with individuals and groups by using special teaching methods and techniques specific to the field, field-specific activity and material development, preparing teaching environments, managing the classroom, assessing, evaluating and reflecting". The aim of Teaching Practice 2 course is determined as "making observations about special teaching methods and techniques specific to the field, making micro-teaching applications using special teaching methods and techniques specific to the field, preparing a lesson plan independently, developing activities and materials about the course, preparing teaching environments, managing the classroom, assessing, evaluating and reflecting". Teaching Practice 2 is a course planned to be taken in the last semester of the final year.

3 Are scenario writing activities an alternative to teaching practice courses?

In almost all teaching undergraduate programs in Turkey, there is not any course in which student can plan a lesson independently and apply the activities within the scope of special teaching methods specific to the field and they can demonstrate all their preferences regarding teaching. For this reason, in this study, the teaching preferences of prospective mathematics teachers were revealed and the usefulness of "scenario writing for mathematics teaching" studies was examined in order to give feedback to them and to make class discussions on these issues. However, it is possible to make more realistic evaluations based on the data obtained from the teaching practice lessons. Nonetheless, weekly analysis of the data obtained by systematic observation in teaching practice and school experience lessons is time consuming. For this reason, instructors cannot give timely feedback to prospective teachers. Although the scenario writing activities consisted of the teaching activities that take place in the minds of prospective teachers, it is considered to be more economical in terms of time and cost. Scenario writing activities should not be seen as an alternative to teaching practice lessons. However, before teaching practice, it was seen as an important contribution to the deficiencies that need to be improved in the teaching approaches of prospective teachers. Because it enables prospective teachers to get feedback on the details of the teaching profession before teaching students in a real classroom environment. Also, in recent years in Turkey, at all levels and stages, curriculum updates are made (Sarıca, 2018). Mathematics education program is among the revised programs. Thanks to these scenario-writing studies, prospective teachers will have the opportunity to examine the updated mathematics program.

The following question has been examined in this study: "Are the teaching scenarios written by prospective elementary mathematics teachers an effective tool to make the pedagogical elements used by prospective teachers visible?"

4 Method

4.1 Research design

Case study design, which is one of the qualitative research designs, was used in the research. Case studies can be conducted in various ways. The most important feature of this research design is that it examines one or a few situations in depth. In case studies, it is essential to consider all the factors related to the research problem with a holistic approach (Yıldırım & Şimşek, 2008). In this research, the effectiveness of scenario writing activities was examined to make the pedagogical elements of prospective teachers visible. For this reason, all the pedagogical elements in the scenarios created by the prospective teachers were tried to be revealed. The obtained data were evaluated with a holistic approach. It can be said that the holistic single case design, one of the case study designs, was used in the study. It is seen that there is no previous study conducted on writing teaching scenarios discussed in the research. For this reason, the analysis of the situation has been conducted with the themes and categories derived from the data.

4.2 Participants

Thirty prospective teachers, who were elementary mathematics teaching undergraduate students, participated in this study. These participants took the communication lesson in the mathematics classes provided electively in the second year of the elementary mathematics teaching undergraduate program. Nineteen of the participants are female and the remaining are male. The aim of the course is, “to realize that mathematics is a language with its own symbols and terminology, to use the symbols and terms of mathematics effectively and correctly, to use mathematical language appropriately and effectively in mathematics and different disciplines and life, expressing mathematical thoughts using different forms of representation such as concrete model, shape, picture, graphics, tables, symbols, etc., expressing mathematical thoughts verbally and in writing, associating mathematical language with everyday language and symbols, interpreting the correctness and meaning of mathematical thoughts” (YÖK, 2017a). After giving the necessary preliminary information to the prospective teachers, the research process started.

4.3 Data collection process

Within the scope of the research, before the teacher candidates were asked to write teaching scenarios, basic information about communication and writing scenarios was given in mathematics classes. In this context, information was provided on the following topics.

- Elements used to organize and explain mathematical thoughts; using mathematical definitions, concepts and symbols to explain real life.
- The use of verbal, visual and written mathematical communication forms (pictures, graphics, dynamic structures, numbers, algebraic expressions, concrete materials) in mathematics teaching.
- Methods of developing mathematical thinking in communication between student and teacher, asking the student to represent the data, explaining a solution, defending a mathematical idea using written, visual and verbal communication, expressing their ideas, having a class discussion.
- Activities to be used at the beginning related to the process of managing a mathematical communication, concepts, strategies and representation forms that can be used in the teaching process, concept-based solutions, effective solutions and methods, generalization activities, asking question by using why and how; re-voicing, repeating, reasoning, adding on and waiting strategies (Chapin, O'Connor, & Anderson, 2009). However, the importance of asking effective questions is also mentioned in this section.

4.4 Training on writing a scenario

The scope of the training given to prospective teachers on writing scripts was in the following topics.

- Sound, visual, behaviour and dialogue elements of the scenario.
- Defining the environment in which the scenario takes place.
- Outline of the scenario (editing, main part and solution stages).
- Paying attention to the teacher and student roles in writing the dialogues, creating realistic dialogues.
- Making explanations about emotional items.
- Making descriptions of the environment and characters before each scene.

After giving information about these stages to prospective teachers, a scenario was prepared together in the classroom. The prepared scenario included the beginning of teaching a math subject in the classroom, managing the activities and closing sections. Shaping the story was easy with the help of everyone, since the subject of the scenario preparation phase was mathematics teaching.

4.5 Data collection tools

Within the scope of the research, the scenario requested from prospective teachers was defined by the researcher. In these definitions, the subject, characters and places in the desired scenarios were explained. Both scenarios focused on out-of-class mathematics experiences related to real life.

Scenario 1: Car Travel Scenario

In this scenario, teacher candidates were asked to address a math teacher who was driving a car with his son. In these conversations, they were asked to use mathematical contents such as speed, time, path, arrival time. Prospective

teachers were asked to write the dialogues between the father and his child during the journey in order to teach these concepts. The prospective teachers easily integrated into this content. In the scenarios written by the prospective teachers, it was expected that different pedagogical elements such as the language used, meaningful teaching, formula and rote learning would emerge.

Scenario 2: Triangles and Similarity Scenario
They were asked to imagine a mathematics teacher using "Right Triangles" and "Similarity" in the distance and height calculation. A situation in which the teacher takes his students out of the classroom to clarify the subject was defined. According to the scenario, the teacher was asked to think that he was calculating the height of the school with his students outside the classroom using right triangles and similarity. The place of the desired scenario is determined outside the traditional classroom environment and as an area where the subject is applied in real life. Therefore, in the scenarios, prospective teachers were allowed to use more innovative pedagogical elements.

4.6 Data analysis
Within the scope of the research, each prospective teacher wrote two scenarios. These scenarios were used in the coding method mentioned by Punch (2013) and Strauss and Corbin (1990). Themes, categories and codes created for this method are completely removed from the data. The scenarios were read independently by the author of this article and a doctoral researcher in the field of educational sciences. Researchers aimed primarily to reveal as many themes as they could find. Then, by discussing these themes mutually, they agreed to give similar theme names to the same phenomenon. The researchers re-read the data after agreeing on the themes. In the second reading, they aimed to reveal the categories of each theme. Researchers also agreed on the expression of sub-themes. At this stage, codes are given to each category. The author of the article and the assistant expert in data analysis coded the data by using these codes in the last reading. The formula of Miles and Huberman (1994) was used to calculate the reliability between encoders. The reliability coefficient between encoders was determined as 0.84. The information provided in the findings of the research were obtained through a consensus after the coding of the researcher and the assistant expert were brought together and discussed.

5 Findings
The findings of the research are given in two stages as "car travel" scenario and "similarity in triangles teaching scenario". When the emerging themes related to car travel themed teaching scenario are examined, it is seen that there are cognitive and affective elements for teaching. When the "similarity in triangles" teaching scenario is examined, five different themes are created. These are named as teaching dimension, assessment and evaluation, teacher, student and

school management dimensions. These themes are presented in separate tables below. Themes related to the car scenario are given in Table 1 as a single table. Findings related to the other scenario are presented below in a separate table (Table 2-3-4-5-6). Percentage and frequency values are given to identify the most frequently recurring categories in the scenarios.

Table 1

Pedagogical elements used by prospective teachers in car travel scenarios

Themes	*Categories*	*Participants*	*N*	*Percent (%)*
Cognitive elements for teaching	Related to Daily Life / Realistic	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20, K21, K22, K23, K24, K25, K26, K27, K28, K29, K30	30	19
	Using the question-answer method	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, k17, K18, K19, K20, K21, K22, K23, K24, K25, K26, K27, K28, K29, K30	29	18
	Asking extra questions / using examples	K1, K2, K7, K8, K9, K10, K12, K13, K14, K15, K17, K19, K21, K22, K23, k25	16	9.9
	Using existing / surrounding materials	K1, K2, K3, K4, K6, K8, K11, K13, K17, K18, K22, K24, K25, K27, K28	15	9.3
	Associating with other disciplines or subjects (Science, Physics, Traffic, etc.)	K3, K4, K7, K10, K18, K22, K23, K24, K26, K28, K29	11	6.8
	Giving direct answer to the question	K3, K6, K7, K11, K13, K14, K15, K16, K17, K29	10	6.2
	Not saying the correct answer / having the student discover	K1, K2, K8, K9, K19, K23, k24, k25, K28, K30	10	6.2
	Using reasoning or guessing skills	K1, K9, K12, K18, K23, K24	6	3.7
	Increasing curiosity	K3, K8, K23, K25, K27, K29	6	3.7
	Reminding pre-learning	K8, K9, K19	3	1.9

Affective Elements for Teaching	Analogy	K9, K18, K26	3	1.9
	Using images	K2, K3, K29	3	1.9
	Including entertainment / game	K1, K22, K27	3	1.9
	Learning by invention	K2	1	0.6
	Questioning	K1	1	0.6
	Considering the student's level / cognitive development	K1	1	0.6
	Learning by doing and living	K25	1	0.6
	Considering factors such as interest, motivation, attitude, fear	K3, K6, K8, K15, K25, K26	6	3.7
	Encouragement for thinking and discovery	K1, K2, K4, K8, K23,	5	3.1
	Exam Anxiety	K15	1	0.6
	Teacher attitude	K15	1	0.6
		Total	162	100

When “car travel” scenario written by the prospective teachers is examined, it is seen that cognitive and affective items are mostly included. The theme of the scenario takes place in an environment where there is little social interaction. Nearly all scenarios cover two people consisting of a father and a child. As expected, prospective teachers used concepts such as speed, time and distance in mathematics teaching during the travel. In the theme of cognitive items used by teacher candidates, it is seen that they all wrote realistic dialogues related to daily life. However, it has been observed that almost all of them used the question and answer method in writing dialogues. In this scenario writing, it was seen that prospective teachers used situations such as asking extra questions and using examples, using materials in the current environment, associating them with other disciplines, not saying the answer of the question directly and making the student find the correct answer. When Table 1 is examined, it is evaluated that the scenarios written by prospective teachers on the theme of car travel can be used to train teachers by giving feedback on the cognitive and affective items they use.

Table 2

Findings regarding the teaching dimension in "Triangles and Similarity" scenarios

Themes	*Categories*	*Participants*	*N*	*Percent (%)*
Elements used by the prospective teachers regarding the teaching dimension	The use of mathematics in daily life	ÖA1, ÖA2, ÖA3, ÖA4, ÖA5, ÖA7, ÖA8, ÖA9, ÖA11, ÖA12, ÖA16, ÖA17, ÖA21, ÖA24, ÖA27, ÖA28	16	12
	Meaningful learning	ÖA2, ÖA4, ÖA5, ÖA6, ÖA7, ÖA10, ÖA11, ÖA12, ÖA20, ÖA21, ÖA22, ÖA23, ÖA24, ÖA27, ÖA28	15	11.3
	Permanence	ÖA1, ÖA3, ÖA4, ÖA6, ÖA7, ÖA8, ÖA12, ÖA14, ÖA16, ÖA19, ÖA20, ÖA23, ÖA28	13	9.77
	Solving questions	ÖA5, ÖA6, ÖA7, ÖA11, ÖA12, ÖA13, ÖA17, ÖA18, ÖA19, ÖA23, ÖA25, ÖA26, ÖA30	13	9.77
	Teaching math outside the classroom	ÖA1, ÖA2, ÖA3, ÖA4, ÖA6, ÖA7, ÖA13, ÖA14, ÖA29	9	6.77
	Learning by doing and living	ÖA4, ÖA5, ÖA6, ÖA7, ÖA16, ÖA23, ÖA29	7	5.26
	Experiment and observation	ÖA1, ÖA2, ÖA4, ÖA6, ÖA10, ÖA14, ÖA18	7	5.26
	To love mathematics	ÖA3, ÖA13, ÖA14, ÖA18, ÖA19	5	376
	Using different teaching methods / materials / technology	ÖA1, ÖA2, ÖA14, ÖA22, ÖA25	5	3.76
	Fun lesson / Game	ÖA2, ÖA20, ÖA22, ÖA24, ÖA29	5	3.76
	Active student	ÖA2, ÖA13, ÖA14, ÖA26	4	3.01
	Associating what has been learned	ÖA10, ÖA20, ÖA24, ÖA26	4	3,01
	Interdisciplinarity	ÖA3, ÖA20, ÖA24	3	2.26
	Embodying the content	ÖA1, ÖA17, ÖA26	3	2.26
	Interest in the course	ÖA1, ÖA2, ÖA24	3	2.26
	Curiosity	ÖA5, ÖA8, ÖA12	3	2.26

Activity based lesson	ÖA11, ÖA13, ÖA28	3	2.26
Considering mathematics as a difficult lesson	ÖA5, ÖA23	2	1.5
Asking questions	ÖA1, ÖA26	2	1.5
Attending Class	ÖA18, ÖA26	2	1.5
Giving homework	ÖA26, ÖA2	2	1.5
Laboratory applications	ÖA2, Ö30	2	1.5
Paying attention to the basic and physical needs of students	ÖA1	1	0.75
Social activity	ÖA2	1	0.75
Classroom seating	ÖA25	1	0.75
Motivation	ÖA2	1	0.75
Value and character education	ÖA11	1	0.75
Total		133	100

When the findings related to the teaching dimension are examined in the "triangles and similarity" scenarios, it is seen that a wide variety of categories emerge. From these categories, it is seen that the themes of using mathematics in daily life, meaningful learning, permanence and problem solving are the most used themes. In this scenario, a prospective teacher was asked by the principal to teach students how to memorize information and shortcuts. In the scenario, the teacher candidate said, “This means memorizing, not learning. The information learned without establishing the link between mathematics and real life will not be permanent [ÖA8]. In one scenario, there is a school principal who thinks negatively about teaching mathematics outside the classroom. In the scenario, the teacher responded to the principal as "But dear principal, I will ensure that the students obtain the knowledge permanently by teaching mathematics outside the classroom. [ÖA3]." As examined in Table 2, prospective teachers used many elements related to teaching dimensions in the "triangles and similarity" scenario. It can be seen that these elements can be used during teacher training.

Table 3

Findings regarding assessment and evaluation dimension in triangles and similarity scenarios

Themes	*Categories*	*Participants*	*N*	*Percent (%)*
Views on Assessment and Evaluation Dimension	Frequent use of multiple choice questions	ÖA1, ÖA2, ÖA3, ÖA4, ÖA7, ÖA8, ÖA9, ÖA12, ÖA15, ÖA16, ÖA19, ÖA20, ÖA21, ÖA22, ÖA23, ÖA24, ÖA25, ÖA26, ÖA27, ÖA28, ÖA29	21	42
	Evaluation of success with the number of multiple choice questions with correct answers	ÖA1, ÖA2, ÖA3, ÖA4, ÖA6, ÖA7, ÖA8, ÖA9, ÖA11, ÖA12, ÖA15, ÖA16, ÖA17, ÖA18, ÖA19, ÖA26, ÖA27, ÖA28	18	36
	High school admission exam / examination system	ÖA1, ÖA2, ÖA4, ÖA8, ÖA12, ÖA17, ÖA20	7	14
	Perceiving "science high school students" as more successful	ÖA2, ÖA11, ÖA19, ÖA20	4	8
	Total		50	100

When the findings related to assessment and evaluation dimension are examined in "triangles and similarity" scenarios, it is seen that much emphasis is placed on test type exams with multiple choice questions. In the scenario of one of the prospective teachers, the principal said to the teacher, “I would like to ask you to do something. I want you to solve more multiple choice test questions than ever before to increase student success. If we can provide this, we will increase the student success [ÖA25].’’ This sentence expresses the school principal's expectation from the teacher regarding the assessment and evaluation dimension. It is thought that these themes created by prospective teachers can be used in the assessment and evaluation dimension in training mathematics teachers. Lecturers and prospective teachers taking the course can comment on these sentences and give feedback on how assessment and evaluation should be.

Table 4

Findings about teacher dimension in triangles and similarity scenarios

Themes	*Categories*	*Participants*	*N*	*Percent (%)*
Pedagogical Elements for Teacher Dimension	Pressure on teachers from principal, parent, colleague, etc.	ÖA1, ÖA2, ÖA3, ÖA4, ÖA6, ÖA7, ÖA8, ÖA9, ÖA10,ÖA11,ÖA13, ÖA14, ÖA17, ÖA19, ÖA21,ÖA22, ÖA25, ÖA26	18	29
	Rote learning	ÖA2, ÖA4, ÖA6, ÖA8,ÖA10,ÖA12,ÖA15, ÖA19,ÖA20, ÖA21,ÖA22,ÖA24,ÖA27,ÖA30	14	22
	Idealism in teaching	ÖA1, ÖA2, ÖA3, ÖA4,ÖA5, ÖA6,ÖA7,ÖA10, ÖA14,ÖA23	10	16
	Faculty of Education Undergraduate Courses	ÖA5, ÖA7, ÖA9, ÖA12,ÖA15,ÖA16, ÖA21, ÖA22,ÖA23	9	14
	Being effective in students' lives	ÖA3, ÖA4, ÖA5, ÖA10	5	8
	Innovation	ÖA2, ÖA3, ÖA4,ÖA23	4	6
	Vocational orientation	ÖA1, ÖA2, ÖA5	3	5
	Total		63	100

When the findings related to teacher dimension are examined in triangles and similarity scenarios, it is seen that there are dialogues in many different areas such as pressure on teachers, education system based on rote learning, idealism, undergraduate teaching program, being effective in students' lives, innovation and professional orientation. Regarding the pressure on teachers, the principal said, “Let's try and see, as you say. But if you are not successful, you will be very upset; I am warning you about this right now. [ÖA 10].” In this case, we can interpret that prospective teachers have a perception that the principal will show negative attitudes and behaviours towards them, when they do not meet the expectations of the school management. In the scenario where a prospective teacher wrote about the preference of rote learning, the prospective teacher added a speech by the principal as "We should choose test solutions and rote learning method for the success of our school [ÖA 21]." Another prospective teacher added the following dialogue to the teacher role; “I am against education based on rote learning. Now go to the class and ask the right triangle and similarity questions. Is it a direct formula to their mind or will we do what we do outside of school? Because the children comprehend what they do by doing and finding on their own [ÖA6]”. Regarding the idealistic teacher category, “The teacher returns to the class again and continues to teach the lesson without

wondering what the principal says. Because there is still hope [ÖA 10]" and "Yunus Teacher is a very young secondary school mathematics teacher. He has been appointed to a new school. He is very excited to be appointed. He has many goals and new thoughts that he wants to accomplish. Because, he has gone through these phases and he knows the students very well. When he starts his new school, he tries to activate his thoughts [ÖA14]." It is seen that these sentences provide a variety of data that can be discussed in terms of teacher training. A prospective teacher wrote the following statement in the scenario regarding undergraduate teaching program: "In line with the education received from the university, the young teacher believes that a real-life mathematics education will be more beneficial to students. The young teacher is determined to convince the school principal of his views [ÖA7]. In the scenarios written by the prospective teachers, it was seen that there are rich data that can be used for evaluations and feedbacks on the teacher dimension.

Table 5

Findings regarding student dimensions in triangles and similarity scenarios

Themes	*Categories*	*Participants*	*N*	*Percent (%)*
Pedagogical Elements for Student Dimension	To give students the ability to interpret	ÖA20, ÖA24, ÖA28	3	21.43
	To provide students with inquiry skills	ÖA8, ÖA24, ÖA27	3	21.43
	Communication skills with students	ÖA23, ÖA24, ÖA25	3	21.43
	To give students mathematical thinking skills	ÖA10	1	7.14
	To give students the ability of abstract thinking	ÖA19	1	7.14
	Intensive, tiring and stressful programs of students	ÖA2	1	7.14
	Low academic success of students	ÖA2	1	7.14
	Responsibilities of Parents	ÖA1	1	7.14
		Total	14	100

When the findings related to the student dimension are examined in similarity scenarios in triangles, it is seen that issues such as commenting, questioning, communication, mathematical thinking, and giving abstract thinking skills are addressed. Moreover, it is seen that students' intensive, tiring and stressful schedules and low academic achievement are mentioned in the scenarios. In

addition, it was determined that the responsibilities of the parents of the students were also stated. Even if these issues are not at the centre of the second scenario asked from prospective teachers, their emergence can be considered as a remarkable finding. If prospective teachers were asked to write a scenario based on the skills that students should gain and focused on student problems, it is thought that more situations related to this theme would arise. In the scenarios written by prospective teachers, some expressions such as "But I am an idealist teacher with goals. My first aim is to establish a healthy communication with my students and to convey the world of mathematics to them in the best way [P23]", "If we always give them multiple choice tests, they will lose their abstract thinking skills [ÖA19]" and "When we first explain a topic, we should show the relationship of this topic with daily life and direct them to think [ÖA24]" draw attention. It is evaluated that these parts in the scenarios are so rich in content that they can be interpreted, illustrated and given feedback in training mathematics teachers.

Table 6

Findings on the school management dimension in triangles and similarity scenarios

Themes	*Categories*	*Participants*	*N*	*Percent (%)*
Elements for School Management Dimension	Education approach of the school principal	ÖA1, ÖA2, ÖA3, ÖA4, ÖA5, ÖA6, ÖA7, ÖA8, ÖA10, ÖA12, ÖA13, ÖA14, ÖA16, ÖA19, ÖA20, ÖA21, ÖA24, ÖA26, ÖA28, ÖA29	20	37
	Negative school principal image	ÖA1, ÖA2, ÖA4, ÖA5, ÖA6, ÖA7, ÖA8, ÖA9, ÖA14, ÖA16, ÖA17, ÖA18, ÖA19, ÖA21, ÖA23, ÖA24, ÖA25, ÖA26	18	33.3
	School prestige and advertisement	ÖA1, ÖA2, ÖA3, ÖA4, ÖA5, ÖA7, ÖA8, ÖA11, ÖA12, ÖA14, ÖA15, ÖA18, ÖA24, ÖA27, ÖA28	15	27.8
	School principal's attitude towards students	ÖA1	1	1.85
	Total		54	100

When the findings related to the school management dimension are examined in the "triangles and similarity" scenarios, it is seen that the school principal's understanding of education, the image of the negative school principal, the prestige of the school and the advertisement are found in the teaching scenarios.

In addition, in the teaching scenario of a prospective teacher, the school principal's dialogues regarding the attitude towards the students were determined. It is seen that these parts about school management are very useful data to emphasize in teacher education. For example, from the scenario of a prospective teacher about the school principal's education understanding category, the following section is considered as a rich content that can be commented, exemplified and given as feedbacks in terms of teacher education.

Manager: Sir, last week you had an activity outside your classroom with your 8th grade students.
Teacher: Yes we did.
Manager: Do you think this is the right decision, sir?
Teacher: I could not understand what was wrong with this.
Manager: They have the exams they need to take at the end of the year. It would be more useful if you solve many questions instead of wasting time with such things.
Teacher: Isn't it important to teach real life related lessons?
Principal: Students don't need real-life information right now. We should aim to prove our school's level of success to the city and the Ministry. Therefore, the number of correct answers to the multiple choice questions in the exam should be increased. We have to solve tests with multiple choice questions [ÖA9].

Regarding the image and advertising of the school in another scenario, the school principal told the teacher: "The success of the exam is important for our school. We need to show the others how successful and a good school we are." When data obtained from the scenarios created by prospective teachers are evaluated in general, it is seen that it contains a rich and diverse information for teaching dimension, cognitive and affective items, assessment and evaluation themes, and teacher, student and school management departments in education.

6 Discussion

The pedagogical elements used by prospective teachers in their first scenarios are examined under the sub-themes of cognitive and affective elements for teaching. It is understood that the pedagogical elements used by prospective teachers are mostly concentrated on cognitive elements. It is observed that prospective teachers often include the structure of teaching related to real life in their scenarios. It is stated that teaching in the context of real life increases academic success and students' interest in the lesson, and thus, the content is learned perceptibly by the students (Acar & Yaman, 2011). It is stated that prospective teachers have problems and are inadequate in associating the issues related to their fields with daily life (Yadigaroğlu, Demircioğlu, & Demircioğlu, 2017). Considering that learning related to daily life provides meaningful and permanent learning, it is extremely positive that prospective teachers who are the

participants of this study frequently include this item in their scenarios. It is seen that teacher candidates frequently use the question-answer method in their scenarios. Similarly, Büyükalan-Filiz (2009) points out that the question-answer method is used in all lessons and that the ability to ask questions is an important competence for teachers. It is understood from the fact that prospective teachers attach importance to the use of examples in teaching in this scenario. At this point, it is stated that the examples used by the teacher should be interesting for students (Ersoy et al., 1991). Teachers should use meaningful, effective and interesting examples for students while providing examples related to the subject in the classroom by taking into account their students' levels, cognitive development and needs. In this context, domestic and foreign music, songs, movies, serials, books, stories, actors etc. that are loved or seen as popular by students should be followed. For example, it may be remarkable for students that, of course, regarding the content, when a science teacher gives examples of Ironman on pressure or wearable technologies, Marvel characters on space, or when a social science teacher gives examples from a historical TV series. In short, it was stated that it is advantageous to bring students' favorite heroes to the classroom environment in terms of content and to get help from them.

Another cognitive element that prospective teachers include in their scenarios is the use of available materials. It is noteworthy that the prospective teachers used real-life tools and materials as materials in the place chosen for the scenarios of their scripts. For example, in the driving scenario, they used the car's rear view mirror, speed / km indicators, traffic signs on the roads, gas stations, etc. It is seen in their scenarios that they use the tools as materials. This approach of prospective teachers can be evaluated in relation to their economics and close and distant principles in education. It can also be said that it is an extremely good qualification in terms of teacher characteristics, since it is also associated with daily life. It is stated that teachers are enthusiastic about it but not sufficient in terms of using materials in the lesson (Ulusoy & Gülüm, 2009). In another study, it was reported that teaching lessons with materials developed on probability was found to be positive by both teachers and students (Gürbüz, 2007). Again, it is seen that prospective teachers sometimes address issues in an interdisciplinary way in their scenarios. It is pointed out that many subjects that are desired to be taught to students have interdisciplinary features, and it is stated that interdisciplinary approach can be applied in both social sciences and science. In recent years, there are many studies that address science and social sciences in connection with each other (Ürey et al., 2013). STEM, which has become very popular in recent years, is an educational approach based on interdisciplinary teaching of science, mathematics, engineering and technology (Sarıca, 2019). Interdisciplinarity is not related to certain subject areas. On the contrary, even fields that are perceived as distant and basic understanding paradigm, such as medicine, law, environmental sciences, energy, economics,

humanities, are likely to be presented under the same roof, in relation to several disciplines.

Another cognitive teaching item used by prospective teachers is to make students discover the correct answer or concept by not directly speaking. This situation can be seen as prospective teachers' attempts to apply the method of learning through the invention. In a study by Temizöz and Özgün-Koca (2008), mathematics teachers often said that they preferred traditional learning-teaching methods in their lessons. For this reason, they stated that they did not use it, although they thought that learning through the invention would provide meaningful learning. At the same time, it is stated that they think this method is not applicable due to the time limitation and the excessive number of topics. On the other hand, prospective mathematics teachers, who are the participants of this study, try to apply this method and enable students to reach and think through exploring without directly giving the correct answer. This may be a reason why all the programs in our country's education system have been prepared in a way to cover contemporary approaches in recent years. As a result of the updates made in the teacher training system, the increasing variety of lessons on contemporary learning and teaching methods may have caused this emphasis. At this point, we see that there are prospective teachers who prefer the traditional method as well as those using the discovery learning method. It is seen that some of the scenarios of prospective teachers included a teachers role in which teacher responded the question directly without giving the student the opportunity to think or find the answer by using hints. This situation can be seen as normal. Prospective teachers have been trained in traditional methods for years and Teacher candidates have been trained in traditional methods for years and are convinced of its accuracy. Of course, direct instruction can be used depending on the nature of the subject or content and the level of the group.

In a thesis study conducted on prospective teachers, it is stated that the participants mostly have positive opinions about research based learning, which is one of the modern approaches, but they still show resistance in the experimental process of the study (Sarıca, 2016). In this case, it is stated that the participants are not accustomed to new and different methods, they have been educated with traditional methods starting from primary school and their habits from the past may have an effect. It is seen that prospective teachers try to support students' prediction and reasoning skills in some parts of their scenarios. In a study, it is stated that elementary school students with high predictive skills have high academic success (Tekinkır, 2008). Therefore, it can be said that it is important to develop these skills of students especially in mathematics teaching. Again, it is seen that prospective teachers try to teach their students by revealing their sense of curiosity, even partially in their teaching scenarios. It is a well known fact that learning often begins with a sense of curiosity. The prospective teachers included cognitive items such as reminding pre-learning, having fun, and playing in learning situations, using visuals, using the analogy method. It

was determined that prospective teachers included less affective elements in their scenarios. In some of these scenarios, items such as interest, motivation, attitude, fear, encouragement, and exam anxiety were mentioned. Focusing more on cognitive elements in teaching is actually a common trend among teachers. However, affective elements are as important as cognitive elements, and maybe even a prerequisite for learning. It is a well-known fact that students with intrinsic motivation in education are more successful than those with extrinsic motivation. This also underlines the fact that having an interest in the subject affects learning.

When the findings in triangles and similarity scenarios are examined, it is seen that the themes of teaching dimension, assessment and evaluation dimension, teacher dimension, student dimension and school management dimension emerged. In this respect, it is thought that scenario writing activities can produce rich data not only in training mathematics teachers but also in all areas of education. Regarding the teaching dimension, it is seen that the use of mathematics in daily life and the meaningful learning categories are the most repeated topics. In addition, it has been determined that there are texts and dialogues in many areas such as permanent teaching, solving questions, teaching mathematics outside the classroom, teaching by doing-living, experimenting and observing, and endearing mathematics. In this respect, it can be said that there are many examples in scenarios to give feedback to prospective mathematics teachers in terms of teaching. In many studies based on the development of teaching skills of prospective mathematics teachers and currently working mathematics teachers, it is frequently emphasized to give them feedback about their own practices (Adler, 1996; Stein & Brown, 1997; Graven, 2003; Breen, 1999; Ropohl & Rönnebeck, 2019).

Assessment and evaluation are vital for effective mathematics teaching. A valid and reliable assessment gives feedbacks to teachers on the effectiveness of their own lesson (Nagy, 2020; Kyaruzi, Strijbos, Ufer, & Brown, 2019; Adams & Hsu 1998; Al Duwairi, 2013). In this way, math teachers can get the opportunity to improve their lesson. Another theme identified in triangles and similarity scenarios relates to the assessment and evaluation dimension of education. When this theme is examined, it is seen that the use of multiple choice tests in mathematics teaching is the most common concept in scenarios. Prospective teachers criticized the use of multiple choice questions negatively in the scenarios. When the Table 3 is considered, it is seen that twenty-one different dialogues have been created in mathematics teaching related to test solving consisting of multiple choice questions. It is thought that discussing the use of multiple choice tests for assessment and evaluation in mathematics teaching will be useful in terms of giving examples of various opinions in scenario writing activities. The evaluation of students' mathematics achievement mostly determined by the number of correct answers in multiple choice exams and the dialogues related to this category were examined under the theme of assessment

and evaluation of scenarios. Examples of scenario writing activities can be used in training prospective teachers on the definition of mathematics achievement of success. Mathematics achievement cannot be assessed only by multiple choice questions. Mathematics facilitates our daily life as it has a related structure associated with many other disciplines (Huang, Huang, & Wu, 2014).

Centra and Potter (1980) stated that there are many factors that affect student success and one of these factors is the teacher. In many studies, it has been found that student success mostly results from teachers (Good, 1979; Lamb & Fullarton, 2002). Marshall (1993) stated that if the teacher has effective features, they can eliminate the disadvantaged aspects of children from poor families. Within the scope of the research, many scenario contents were determined regarding the teacher dimension of education. When these opinions are examined, it is seen that the dialogues in the theme of "pressure on teachers" are the most used topic in the scenarios. The negative aspects of the "memorization in mathematics teaching" approach were also highlighted in the scenarios by prospective teachers. In the triangles and similarity scenarios, there are also elements related to "how should be the undergraduate education of teaching" and "what should be the role of the teacher who is effective in students' lives". These resulting dialogues can be used as a discussion tool in education on how to be an effective teacher in teaching mathematics. It has been determined in many studies that teacher factor is very important especially in mathematics lessons (Good & Grouws, 1979; Lamb & Fullarton, 2002). It is understood that there are also elements of dialogues with innovativeness and professional orientation, even if they are rarely mentioned compared to others.

According to Vygotsky (1986), there is a strong interaction between a child's social world and cognitive development. Students from different social backgrounds show different achievements and skills in education. The aim of education is to provide these students with some knowledge and skills, regardless of their different backgrounds. Situations regarding the student dimension of teaching were also used in the scenarios by prospective teachers. There are some parts that emphasize the acquisition of skills such as commenting, questioning, communication, mathematical thinking, and abstract thinking, although their numbers are few. These sections can be useful in training teachers to evaluate students' dimension of education. In addition, it was seen that students' intensive, tiring and stressful programs, low academic achievement and parent factor were mentioned in the scenarios. These findings show that scenario writing activities provide rich content about the skills that prospective teachers should acquire. In teacher training institutions, comments and evaluations about these issues can be made and used as real examples to raise awareness.

School management should be in close cooperation with teachers and parents to ensure suitable and appropriate education. If there are inconsistencies between the school administration's understanding of education and teachers' attitude

towards education, this situation may negatively affect the academic success of the school. The impact of the school on success is closely related to the characteristics of the school. In a study by Mortimore et al. (1988), they found that the effect of school on mathematics lesson was ten times higher than that of the family. School and class processes have been found to be more effective than the social, economic and ethnic backgrounds in student success (Charlton & George, 1996). In the scenarios written by prospective teachers, elements related to school management were also identified. When these are examined, the dialogues of the principal's understanding of education, the image of the negative principal, the prestige and advertisement of the school and the attitude of the principal towards the students were determined. They have revealed situations that can be used to train teachers in the faculties of education during the pre-service period.

Prospective teachers reflect the pedagogical elements that they construct in their minds in the form of dialogues during the scenario writing process. In this process, their creativity comes to the fore. It also requires deep thinking about the theme of the script. It is thought that these processes can be explained in the literature with the concept of "dialogic reflection". Prospective teachers transfer the situations they constructed from their minds to the scenarios. From this point of view, it can be said that they make a “dialogic reflection” in a sense. Dialogic reflection requires teachers to evaluate their own practices by talking to others (Mann & Walsh, 2013). The prospective teachers evaluate the practices that they designed in their mind during the script writing process as if they were talking to others. Similarly, Bailey (1996) stated that prospective teachers' collaborative speeches on how to teach a subject are a very useful method in teacher education. The only difference in scenario writing activities is the transfer of the situations that the prospective teacher constructs in the mind to the conversation process. In this study, it is concluded that general evaluations such as class discussion can be made on these conversations in some selected scenarios. This discussion process can actually be evaluated within the definition of "dialogic reflection" on a virtual scenario that the prospective teacher has built.

Conclusion

Future research may focus on whether scripting activities are a useful tool in other topics and areas. The "car travel" scenario in this research is given within the scope of the theme which includes only two people and a limited environmental interaction. The second scenario presented in this study is the triangles and the similarity scenario. In the second scenario, the role of a teacher who conducts applied and real-life education outside of school is defined. While giving other scenarios, teacher candidates may be asked to write a script by giving themes. However, further researches can be conducted on the use of script writing activities in the teaching of subjects at high school and secondary school level. In addition, it is stated that it is important to include students'

expectations in learning-teaching situations (Sarıca, 2020). Therefore, opinions of prospective teachers can be consulted on subjects such as content and form features of the scenarios. Scenario work can be further customized. For example, prospective teachers may be asked to work in certain contexts or on scenarios where certain learning-teaching methods are used. For example, it has been reported that a different and rich learning environment is created thanks to the technologies used in flipped classroom environments (Özbay & Sarıca, 2019). A scenario study can be made for teacher candidates to teach a subject in a flipped classroom environment.

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The Attitudes of Parents towards the Introduction of Compulsory Pre-School Education in Slovakia

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Abstract:
Introduction: This empirical study discusses the issue of compulsory pre-school education in the Slovak Republic from the viewpoint of the parents of children attending nursery school. The goal of the research is to establish the attitudes of presents to compulsory education a year before the child begins school. The research therefore works with two key concepts, this being the obligation of educating children before they begin primary school and "attitude" as a relatively stable assessment of the object to which it applies.
Methods: A rating scale questionnaire of our own design was used to collect data. It was administered through a web interface. A five-level scale was used to apply a Likert scale and statements were classified into five dimensions. The research tool had 36 items following validation. The available sample was used to create the research sample. Data was collected in the Czech Republic and in Slovakia; the sample of parents from Slovakia consisted of 162 respondents. Each of the respondents had to have at least one child of pre-school age. When processing the research data the basic statistical characteristics were used, along with a non-parametric Friedman test. Calculations were executed in STATISTICA and SPSS software.
Results: The surveyed parents attributed the appropriate importance to compulsory education a year before children begin primary school, they did not believe that implementation of this obligation would have any significant impact on the family's life and appreciated its importance for their child's subsequent education. They rated potential interference in the organisation and assurance of pre-school education, related to the newly originating obligation, as suitable and appropriate. They disagreed slightly with the academic focus of pre-school education.
Discussion: The consensual opinion of the surveyed parents in regard to implementation of the obligation to educate children a year before they start primary school seems a good basis for realisation of this legislative

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amendment. In their attitudes, the parents incline towards the fact that compulsory education before starting primary school could help their children start their subsequent educational career, or could enable a smoother transition between the two levels of education. The structure of the research sample focused more on middle-class parents. Parents, due to whom this obligation was chiefly implemented, were not surveyed. It can be assumed that the situation will be similar in relation to attendance of nursery school.

Limitations: The main limiting element in the presented research is the available sample of respondents for the research sample. Likewise, validation of the questionnaire, which passed through all the necessary phases, but ran up against the obstacle of the available time and personal availability of researchers and respondents during one phase.

Conclusion: The results can be considered positive and no strongly disagreeing standpoints by middle class parents towards compulsory education at nursery school were registered. It would be very useful for further research to survey parents who are not mainstream and children who appear disadvantaged when starting nursery school, chiefly due to the attitude of these parents.

Key words: importance of pre-school education, compulsory attendance of nursery school, parent, attitude to education.

Introduction

Education of five-year old children is compulsory in the Slovak Republic starting from school year 2021/22. This can be realised by either of two methods; by attending a nursery school, or home schooling, or, in the words of the law, individual education. This means that the Slovak Republic has adopted the institute of the obligation of education, not just attending school. The legislative amendment took place at a time when the state is still not fully capable of fulfilling the requirements of parents and the rights of children of pre-school age for education or institutional care in early age. This means that it also does not have the capacity to cover demand arising from the requirements of parents and also with regard to critical voices from the EU regarding the low level of schooling of pre-school age children in Slovakia.

This study is about this serious and current topic in Slovakia from the viewpoint of parents, consumers of pre-school education. Using a quantitatively orientated survey, it endeavours to present the attitudes of parents, which were registered at the time this legislation was approved, by means of a rating scale questionnaire of our own design. This has the standard structure of an empirical study. It therefore presents the theoretical basis of the research carried out, then its methodology and finally its results, which are discussed with regard to the situation in the field of pre-school education in Slovakia.

1 The theoretical background of the research

1.1 The importance of pre-school education

Parents of pre-school age children in Slovakia became members of the community of parents who are responsible for the fact that their child will receive compulsory education from the age of 5 in 2020. This means that a new element, which had previously only been linked to starting primary school, will be added to the standard parental obligations, and this is to ensure that their children start attending nursery school at least a year before starting primary school; or to provide the child with individual education (home schooling) if they have the motivation and conditions to do so.

The decision by Slovak legislators to legalise the obligation of pre-school education was certainly preceded by the conviction and consensus of its importance, not only for the child itself, but also for society, in which the child will function as an adult, in the broader aspect. It is therefore correct to repeat at this point that the credibility of pre-school education has undoubtedly risen over time. This ascribed importance is based on an increasing number of reasons that are rooted in economic analyses proving the effectiveness of investments directed towards pre-school education. This is actually a strategy promoting economic growth, because the future of society depends, to a significant degree, on the potential of an educated and qualified labour force (Heckman, 2013). The emphasis on the importance of pre-school education has also been based on the conclusion that the family and parents of a child are not capable of assuring conditions for the child's harmonic personality development and, from this aspect, education during a pre-school age is exceptionally beneficial (see for instance Barnet, 2008; Yoskihawa et al., 2013; Melhuish, 2004; Gambaro, Stewart & Waldfogel, 2014).

As in other countries[1], when approving the legislative amendments, the authors primarily considered children who need support during education for various reasons, most often due to poor or a complete lack of care by their parents. There also seemed to be problems in relation to the inter-cultural differences in family environments of children, who started primary school, without having any previous schooling, which means they were disadvantaged from the very beginning of their school education. Since it became a member of the EU, the Slovak Republic has been hearing from the European Commission (2006) that pre-school education has the highest return rate out of the entire continuum of

[1] We are closest (in time and distance) to the Czech Republic, where approval took place in 2016 and realisation began from September 2017. Pre-school education has been compulsory in this country for 4 years now. For instance in Poland, pre-school education is compulsory for all 6-year old children and children from 3 years of age have a guaranteed place at nursery school. Hungary is the leader in the availability of pre-school education, nursery school is compulsory for children from 3 years of age and it also has a high rate of participation in pre-primary education.

life-long education, particularly for children from a disadvantaged environment, and the results of this investment actually increase in value over time. The EU has regularly appealed to us to improve the availability of pre-school education. However, we are still rate very low from the aspect of education of children of pre-school age compared to other OECD countries (Vančíková, as cited in Hall et al., 2019).

The reasons concerning the personality of each child are also relevant in the context of the importance of and justification for pre-school education. Good pre-school education has the potential to support the child's mental and physical development, and naturally also its social skills. The question therefore is not whether to send a child to nursery school. Under the conditions in the Slovak Republic, the question is, at this time with regard to the available capacities, when, or at what age and where to send the child.

Discussions concerning pre-school education usually lead to the conclusion that it is incredibly important, or even the most important, for the child's progress (Heckman, 2011; Litjens & Taguma, 2010; Knudsen et al., 2006). On the other hand, we do not have a clear overview of what actually happens within the terms of this education, apart from the fact that it often seems relatively fragmented or poorly regulated (OECD, 019). It would therefore certainly be useful to reveal the field of pre-school education in all its contexts through research.

1.2 Parents in relation to pre-school education

There is no doubt today that pre-school education is closely linked to the parents and families of children who are the target group of this education. This is emphasised by most strategic concepts on the level of individual states and the EU or the OECD. At the lowest levels of school systems, every interested nursery school or primary school teachers, who are the key participants in initial education, is convinced of this.

Parents are powerful players in relation to nursery schools and must be taken into consideration. In this context, it should be repeated that this particularly concerns middle-class parents, who understand the semantics of the educational space and the impulses it affords, and they usually also have their own experience from nursery school. These parents, also with regard to the post-modern social trend, set quite demanding goals within the terms of their parenting and it can therefore be assumed that introduction of the obligation of education at pre-school age will not mean any significant difference to their parenting strategies. They are aware of the success of their children, at school and also in life and not least in their professional career. They are interested in their children's personality development, their self-realisation, in supporting their identity and authenticity with the goal of achieving harmony with themselves and with the world around them, all while utilising their hidden potential (Dudová & Vohlídalová, 2005). This means that consideration of any intervention in the configuration of pre-school education is useful with regard to

the parents and their attitude towards this level of education, or at least in the context of its demands, concepts or expectations.

The Slovak Republic has implemented compulsory pre-school education for all 5-year old children, in the interests of increasing the proportion of children who have received preliminary education before starting primary school. This should be realised in an institutionalised manner, with the option of whole-day or half-day attendance of nursery schools that are members of the network of schools and school facilities in the Slovak Republic. Another option should be individual or home schooling, or schooling in facilities that are not members of the network of schools and school facilities. This means that parents have a theoretical choice.[2] Parents usually do not differentiate between nursery schools that are members of the school network and "non-network" facilities. They also certainly do not assume that pre-school education can also be provided by non-qualified teachers at nursery schools that are not members of the school network according to valid legal regulations. The criterion for their satisfaction is primarily that their child flourishes.

The fact that their child will have a guaranteed place at a nursery school at their permanent place of residence when it reaches 5 years of age will certainly mean a major change for parents. However, this does not preclude the option of registering the child for compulsory education at another nursery school. The institute of postponed compulsory school attendance is also cancelled, the child will simply be able to continue compulsory pre-school education, but will have to start primary school when it reaches 7 years of age at the latest.

The most limiting issue currently seems to be the threat to assurance of education for younger children (younger than 5 years), whose probability of being admitted to a nursery school in some regions of Slovakia may be worsened considerably for capacity reasons. If a parent decides to home school their 5-year old child, another child may be temporarily admitted in this child's place at the nursery school, but only for the duration of home schooling, which may be terminated at the request of the parent, or for other reasons at any time during school year. In principle, this does not resolve the issue of the lack of capacity at nursery schools.

[2] The head of a school facility may decide on home schooling of a child on the basis of the child's poor state of health or on the basis of the parents' request. Home schooling at the parents' request is assured by the parent or another person who has at least a full secondary education. Compulsory pre-primary education may also be assured by a facility that is not a member of the school network. In this case, the parents are required to provide their cooperation and ensure that the child's personality development, as assured by the nursery school, is verified.

1.3 Attitude as a psychological and research category

During this research we were interested in the attitudes of parents in regard to the education of their children. We were interested in the fact that this concerns a relatively stable combination of trust, feelings and a tendency to behave in regard to socially important objects, groups, events or symbols (Hogg & Vaughan, 2005, p. 105) identified in parents. The rhetoric of the research applied the phenomenon of the parents' attitude to compulsory education at nursery school.

Most definitions of attitude accent its assessing nature, its overlap. We also based our research on definition of attitude as a specific assessing opinion, which a person assumes towards some sort of object, event, idea, item or another person (Nakonečný, 2009). For the requirements of our research and on the basis of Eagl and Chaiken (1993), we operationalized attitude as a psychological tendency, natural to a person, which is expressed by assessment of an entity - this being compulsory pre-school education in its selected context, with a specific degree of consent or disagreement.

When creating the research tool and within the terms of interpretation of research data, we also had to take into consideration other important aspects of attitude (Jhangiani & Tarry, 2014):

- attitude is formed by the cognitive element (opinions and ideas about the subject of the attitude), the affective elements (feelings, emotional response to the subject of the attitude), the active element (the tendency to behave and act in a specific way towards the subject of the attitude);
- attitude is partially inherited, it is also the result of a person's direct and indirect experience with the subject or object of the attitude;
- even though accord is expected between attitude and behaviour (this concerns the internal consistency of attitude, an accord between the cognitive and active element for instance), in some situations the relationship is stronger than in others, this also applies similarly in relation to people – in some this consistency is greater and in others weaker;
- we can assume a person's behaviour on the basis of the consistency of their attitude;
- some standpoints are more important for a person than others, because they have a greater impact on their everyday life, during which time the importance of a standpoint is assessed depending on quickly our mind reflects it and works with it;
- some standpoints are based on faith (to believe – to consider true), others are based on feelings or behaviour;
- we do not change strong standpoints very often, we trust them, with the understanding that they more often also guide our behaviour.

This conceptualisation was the basis for our research and assessment of the established results. When formulating our statements, we reflected the standpoint that opinion can be considered a specific type of attitude, or more

precisely, it is essentially part of its cognitive element. We considered that the emotions influencing a relationship to some object or situation, define attitude from opinion. We therefore also assumed the risk that attitude may not comply with the presented opinions of an individual.

2 Research on the attitudes of parents

The presented research is based on the statement that the parents of pre-school age children, who are obliged to undergo institutional education at a nursery school, are important participants in pre-school education. Not only from the aspect of their parental relationship with their own child, but also in reflexion of other important variables, which we can identify within the terms of pre-school education. For instance, with regard to the quality, nature or conditions of the education themselves. Parents also have the potential to become significantly involved in discussion of its importance.

We were interested in the attitudes of the parents of children in pre-school education in relation to the major change that affected it, which was implementation of the obligation to educate children a year before they started primary school. One of the options of realising this is compulsory attendance of a nursery school during the last year and we used this concept in our research. The research was directed at parents in the Czech Republic and in Slovakia, its main idea was to compare the attitudes of parents in both countries. We work with partial results from Slovakia for the requirements of this study.

2.1 Research goals and questions

The main goal of this research was to find out what the attitude of parents is towards compulsory pre-school education at nursery schools, which is to take place a year before their child starts primary school. This was preceded by development of a questionnaire, which would be a suitable tool for measuring these attitudes, which we consider one of the partial and individual goals of this research. The goal of the research was then specified in the following questions:

What are parents' attitudes:

- towards the obligation of assuring education of their child a year before it begins primary schools?
- towards the declared importance of compulsory education at nursery schools?
- towards compulsory education at nursery schools with regard to the educational outlook for their children?
- towards the intended focus of compulsory education at nursery schools?
- towards compulsory education at nursery schools in relation to assurance of staff and organisation?

2.2 Methods of collecting and analysing data

We chose a questionnaire that we designed to research attitude. In compliance with the applied method of measuring attitude by means of a Likert scale, we used a five-level scale reflecting the degree of consent or disagreement (from "I strongly agree" to "I strongly disagree", the middle of the scale consisted of the statement "I don't know"). In addition to an introductory passage, to establish contact with the respondents, the questionnaire has a main part filled with items for measuring attitude in its three elements and a section for acquiring demographic information about the respondents (education, age, gender, number of children, marital status). The questionnaire underwent validation through individual phases; the primary research was carried out using a tool that had 36 items divided into 5 dimensions (with a satellite of 6 demographic items).

Development of the questionnaire

Administration of the research tool was preceded by proposal of a battery of statements that were intended to represent the three main elements of attitude. Within the research team we summarised approximately one hundred statements, which we consulted with experts and parents of children of pre-school age, we took into consideration the attributes of attitudes and the requirement of creation of Likert scales for their measurement. Compiling a sufficient amount of statements, which would proportionately saturate the issue in all three elements of attitude - cognitive, affective and active - was a demanding part of this phase of construction of the questionnaire.

The subsequent version of the questionnaire contained 63 statements after modification. We administered this to 10 parents with the understanding that we communicated its completion with them once again. We finally initiated validation, by means of a factor assessment (FA) with 133 respondents, with a questionnaire consisting of 61 items. Its goal was to establish what its factor structure was. Our intention was also to reduce the number of items by removing items with a low factor burden.

However, the results of the FA, even after selection from several factor solutions, did not achieve a sufficient value for explanation of the overall variance of the questionnaire. This meant we had to go back to the individual items and propose their modification, also on the basis of the results of the FA. Due to the shortage of time and the limited number of respondents, we did not subject the new 36-item questionnaire to another FA and started collecting data.

After another consultation with experts and parents, and confrontation with the results within the terms of preliminary research, we divided the questionnaire into 5 thematic sections, during which time each of the contained 7-8

statements.[3] We give the names of the sections and an example of two items from each of them below.

I. The child's educational outlook (hereinafter Dimension I. The child's outlook)
33. Compulsory attendance at nursery school reduces the risk of the postponing the child's admittance at primary school.
8. Compulsory attendance at a nursery school is suitable for some children for various reasons.
II. The focus of compulsory pre-school education (hereinafter Dimension II. PE character)
32. Children should be taught through play within the terms of compulsory attendance at nursery school.
13. I wouldn't mind if the children were also given homework at nursery school.
III. The importance of pre-school education (hereinafter Dimension III. PE importance)
28. Implementation of compulsory pre-school education has increased its importance.
7. I cannot imagine that my child would not go to nursery school a year before attending primary school.
IV. The obligation of compulsory pre-school education (hereinafter Dimension IV. PE impact)
34. The compulsory attendance at nursery school means unnecessary acceleration of the child's school duties.
31. Implementation of the child's compulsory attendance at nursery school has not meant any changes to pre-school education.
V. Assurance of pre-school education (hereinafter Dimension V. PE assurance)
5. Only teachers with a university qualification should assure compulsory attendance of nursery school.
22. Excusing a child from compulsory education at nursery school could be a burden for parents.

We used basic statistical characteristics (arithmetic average, modus, median, statistical deviations, dispersal) on the level of first-level classification of data to process the research data. If the assumption for normal division of data was not fulfilled, we also used non-parametric tests. Primarily the Friedman test, which is a generalisation of the Wilcoxon signed-rank test, and is an analogue of analysis of dispersal of double classification with a single observation in each sub-class. During the Friedman test, we applied Nemény's method of multiple

[3] As we stated above, we intended to compare the attitudes of parents in the Czech Republic and in Slovakia, the questionnaire was created in two language versions and was also administered in the same manner.

observation for comparison of the differences between individual sets. We performed calculations using STATISTICA and SPSS software.

2.3 Selection and characteristics of the research sample

Data was collected at the time of the COVID-19 pandemic, at the turn of 2020/2021. This is also why the questionnaire was exclusively administered through a web interface. We posted the questionnaire through available electronic channels and networks, and we also used our personal and professional contacts. We therefore consider selection of the research sample reasonable.

We acquired data from 337 respondents; the sample of parents from the Slovak Republic contained 167 respondents (the remaining 175 parents are from the Czech Republic). Each of the respondents had to have at least one child of pre-school age.

Additional characteristics of the research sample in the Slovak Republic are presented in Table 1.

Table 1

Basic characteristics of the research sample

Respondents			
Gender	65.4% women	34.6% men	
Age	46.3% - 31-36 year	24.1% - 37-42 years	19.8% - 25-30 years
Education	48.8% - university	44.4% - secondary	6.2% - higher vocational
Marital status	61.1% - married	24.1% - single	14.8% - divorced
Has a child that will start primary school next year (child's age)	58.6% - no	41.4% - yes	
Number of children	54.3% - 2	37.7% - 1	8% - 3

We can essentially state that the questionnaire was completed most often by married women, aged over 30, with a university or secondary education, with two children, whose child will not start primary school next year.

2.4 Research limits

We chiefly consider the unclear validity of the research tool and the method by which respondents were chosen to be limits of the presented research. It is widely known that the available sample is the weakest type of selection of a research sample from the aspect of generalisation of the results, which is why the conclusion should be chiefly applied to the surveyed parents. Despite this, we believe that the results and conclusion of this research do give an idea of the attitudes of parents towards compulsory pre-school education at nursery schools

in Slovakia, which may be of interest in the context of the fact that this legislative step is of current significance. With regard to realisation of this legislative amendment in practice from the 2020/2021 school year, the conclusions have the potential to signalise the potential behaviour of parents. Although according to the attitudes of the mainstream group of parents of children in compulsory pre-school education, who are "more obvious" in research in the long-term and are more willing to share their opinions.

3 Results

3.1 The attitudes of parents for the entire sample

After the first phase of sorting data, we achieved the result we present as a summary in Table 2. Overall, we can state that the surveyed parents attribute the appropriate significance to compulsory education a year before children start primary school, they do not believe that implementation of this obligation will have any significant effect on the life of the family. On the contrary, they believe that this measure has a positive effect on the child's further education. In their attitudes, they rate the potential impact on organisation and assurance of pre-school education related to the newly originating obligation, acceptable. We analyse the specific results in the following passage.

Table 2

Basic results (AA - arithmetic mean, DD – determinant deviation) for individual dimensions

	Dimension I. Child's outlook	*Dimension II. PE focus*	*Dimension III. PE importance*	*Dimension IV. PE obligation*	*Dimension V. PE assurance*
AA	2.24	2.15	2.24	3.50	2.56
DD	0.650	0.470	0.800	0.620	0.580

In the first dimension we focused on the attitudes of parents to how they perceive the educational outlook of their children with regard to their participation in compulsory education at nursery school. We directed the statements towards declaration of a standpoint to how the parents perceive the risk of postponement of school attendance, the child's success during registration for primary school, the child's success in adaptation to the primary school routine, and also the child's results at the beginning of primary education. All this is in relation to the expected obligation of education a year before starting primary school. As it is evident from Table 2, the parents presented positive attitudes ranging on the level of consent at an AA = 2.24. When the individual elements of dimension I. are viewed more closely, the results of statement Compulsory attendance of nursery school will support the child's good adaptation to the routine at primary school (statement 1) with an AA =1.62, are interesting. It seems that parents have a clear opinion of the issue of

child's adaptation to the life of a pupil in relation to pre-school education, because their response was of a consensual nature. This can be considered a signal representing their positive approach to compulsory education at nursery school, although through the prism of interest in their own child, which is understandable and presumable in the long-term.

In the second dimension we had the ambition of covering the focus of compulsory education at nursery school from the viewpoint of the parents, and we presented statements directed towards its target configuration. In individual statements this concerned the degree of consent or disagreement with the fact that compulsory education should support the emotional and social development of the child, its creativity, foreign language education or learning skills, and that it should also take place through play activities. One of the statements was also directed at potential home schooling, and the AA in this statement was 2.6, which meant localisation around the medium value on the scale. As is evident from Table 2, the respondents again inclined towards consensual standpoints (AA=2.15). They agreed most with the statement that Compulsory education should take place through play (statement 32; AA=1.64), and agreed least with the statement that Children should learn to read and write a year before starting school (AA=2.77) (statement 2). This also shows that the surveyed parents have accepting attitudes towards the focus and nature of compulsory education at nursery school a year before starting primary school and respond positively overall to its current configuration.

The third dimension should reflect assessment of the importance and usefulness of compulsory pre-school education from the perspective of the questioned parents, on a general level. The responses of the respondents again fell within the first part of the scale, at around the level of consent, with an AA=2.24 (Tab. 2). The Slovak Republic has problems fully covering demand by parents for pre-school education from the aspect of capacity (Pupala, 2020). This is also why we can explain and understand why parents agreed most (AA=1.67) with the item I am glad that my child has to attend nursery school at least a year before starting primary school (statement 24), or I cannot imagine that my child would not attend nursery school before starting primary school (statement 7; AA=1.90). On the contrary, parents expressed a degree of disagreement with the obligation of children younger than 5 years old attending nursery school in the item Compulsory attendance should not only apply to children a year before starting primary school (statement 3), where the AA value reached 2.77, i.e. undecided to moderate disagreement.

In the fourth dimension we presented statements to parents by means of which we wanted to uncover their assessment of the obligation of compulsory education at nursery school itself. We chose the format of the reverse meaning of the statement concerning the need and reasoning for the obligation of attending nursery school, or with regard to the indicated changes to pre-school education. The surveyed parents usually expressed essentially disagreeing

attitudes in statements in dimension IV. (AA=3.50, Table 2), for example with the statement that Compulsory nursery school attendance means unnecessary acceleration of the child's school duties (statement 34; AA=3.67), that There are no grounds for it with regard to the child's age (statement 35; AA=3.56), or that Implementation of pre-school education will not change anything (statement 31; AA=3.03). From these results we can see the willingness of the surveyed parents to accept an obligation of educating their children even before they begin primary school and acceptance of this obligation configured according to the age of the child. We did not encounter a feeling of pointlessness or the inappropriate acceleration of the child's development in the parents' attitudes, however, parents also do not agree with the fact that pre-school education itself will not change.

In the fifth dimension we were interested in the attitudes of parents to the aspect of assuring staff, organisation and material for compulsory education at nursery school. In their responses respondents ranged around the middle of the scale (AA=2.56, Table 2). We registered a consensual attitude in statements concerning a Smaller number of children in the class than previously (statement 21; AA=2.10), Assurance of more intensive cooperation with the relevant experts (speech therapist, psychologist, paediatrician, primary school teacher) (statement 26; AA=1.81) and Specific adaptation of nursery school areas and equipment for the requirements of compulsory education (statement 11; AA=1.83). It can therefore be concluded on the basis of the responses from the surveyed parents that implementation of compulsory education before starting primary school is linked to the expectation of its more intensive assurance, which would be qualitatively more saturated with the support of experts, particularly with regard to the stipulated obligation. We repeat that the research sample of parents inclined towards middle-class parents of children of pre-school age and does not reflect extreme cases of parents.

3.2 The attitudes of parents according to the age of the child

We believe that the results may be intriguingly linked to the fact that the parents' attitudes originate under a situation in which the parent currently cooperates with the child on a daily basis at the age of compulsory pre-school education. Along with other classic demographic attributes, which are used regularly, we also assumed that this variable could have a relevant link to the parents' attitudes.

For further analysis we therefore chose to seek statistically significant relations between parents who have a child of this age and those who do not. (We used the item: Will your child start primary school next year?) For better orientation in the subsequent text we therefore chose to identify parents with a pre-schooler or without a pre-schooler. The basic descriptive data in relation to the monitored variable is given in Table 3.

Table 3

A in the dimensions classified by parent with or without a pre-schooler

	Dimension I. Child's outlook	*Dimension II. PE focus*	*Dimension III. PE importance*	*Dimension IV. PE obligation*	*Dimension V. PE assurance*
AA for parents with a pre-schooler	2.31	2.12	2.15	3.71	2.24
AA for parents without a pre-schooler	2.19	2.17	2.30	3.35	2.86
Total AA	2.24	2.15	2.24	3.50	2.56

When viewing Table 3 it is evident that the differences in arithmetic averages between the groups of respondents, who have or do not have a pre-schooler, are only more significant in dimensions IV. and V. In these dimensions a statistically significant difference was also confirmed during application of the Wilcox two-sample test. We tested the statistical significance for each dimension separately and we executed the test using STATISTICA software. After entering the input data we gained the following results in Table 4 for the chosen test: test criterion value Z and value p. In other cases (dimensions) the differences between the average values of the responses from respondents/parents (with pre-schooler/ without pre-schooler) were not statistically significant (Table 4).

Table 4

Differences between parents depending on parent with/without pre-schooler

dimension	*Z*	*p*
I.	1.18	0.24
II.	-0.34	0.74
III.	-0.90	0.37
IV.	3.91	0.00*
V.	4.29	0.00*

The aforementioned differences signalise that parents who are linked to a child who could be required to take part in pre-school education from the educational aspect, have a more positive attitude in relation to the obligation of pre-school education (dimension IV.) itself, and also to assurance of compulsory education (dimension V.) before starting primary school. It can therefore be assumed that the current personal experience can model parents' attitudes and shift them in the direction towards acceptance of the expected obligation.

In dimension IV. this means that these parents more strongly disagree that compulsory pre-school education could be considered unnecessary acceleration of the child's school duties and therefore without grounds with regard to its age. However, they also declared the tendency to disagree with the statement that legislative intervention in pre-school education will not change anything. It can therefore be assumed that consent to the obligation of educating your child before its starts primary school is also linked to awareness of the changes in circumstances affecting the life of the child and potentially the family.
The parents of pre-schoolers expressed stronger consent to their children having the opportunity of being educated in a smaller group of children, in adapted areas and with specific equipment, during the last year of nursery school attendance, in dimension V. The need to assure closer cooperation with other experts, who have the potential to detect or deal with potential problems encountered by children or make the path of transition to the next level of education easier (speech therapist, psychologist, paediatrician, primary school teacher) was similarly reflected.

4 Discussion

If we apply the results to the research questions, we can state that there is no essential animosity from parents in their attitudes to compulsory pre-school education. This is a good signal for launch of compulsory education at nursery schools in Slovakia. In their attitudes, parents incline towards feeling that compulsory education before starting primary school can help their child start its subsequent educational career, or assure a smoother transition between the two levels of education. We can observe an analogue to research by Jarkovská (2020) here, where parents from Czech state nursery schools (as a model for state nursery schools in the Slovak Republic) trust the state that it will provide a good service and also the nursery school that it will make this service available.
As we previously indicated, the conclusions from our research reflect the attitudes of parents essentially representing the middle class. We can assume that these individuals will be willing to listen to the school itself and defer or coordinate their family strategy to the challenges that come from the school, in our case from the state. (This is also why we use the formula "surveyed parents" in the result section). This complies with the discourse according to which the achieved level of education and the social-economic status of the parents are important predictors of their child's educational success. In addition to (and based on) the classics in this field (P. Bordieu, L. S. Vygotskij, B. Bernstein, J. Coleman) Starting Strong III (2012) also states this for instance in relation to the agenda of pre-school education, when the report summarises research background materials, according to which parents with limited education and a low social status are less capable of supporting the school and involving their children in learning activities (Ermisch, 2008; Feinstein et al., 2007, 2008). In Slovakia this is research by Kaščák and Betáková (2014), which implicitly

indicates that more sophisticated support of the child's development at nursery school can be expected from parents with university education. It must be mentioned for instance that our research did not cover parents who are not socially disadvantaged, do have a secondary school or university education and do not send their children to nursery schools. H. Picková (2017) executed research with such parents in the Czech Republic and found that these parents do not consider nursery schools to be institutions that would be able to assure their child's effective development and that they consider their most important purpose to be in the socialising effect of contact with peers. This is why they considered the obligation of educating their child before starting primary school unnecessary and restrictive.

The child's success at school is naturally preceded by its participation in education. One of the items in our questionnaire also focused on whether the parent would send his/her child to nursery school even if the child's participation in education were not compulsory. Parents agreed in this (AA=1.57) which is a signal that "mainstream" parents do not need this obligation for their attitudes, but it seems that they accept this need. The expected transformation of the principle of voluntarism into an obligation is relatively free of problems in the parents' declarations and concerns about premature scholarisation or restriction of parental rights did not appear. This complies with previous perception of the children's participation in pre-school education in Slovakia. A great number of 5-year old children, who had not previously attended nursery school, came from socially disadvantaged environments; there was also fairly low involvement in pre-school education in children with medical disabilities (Varšík, 2019).

The surveyed parents believed that this education should take place through play and develop their children's social skills and also learning skills. This is reminiscent of the discussion that parents of pre-school age children in the USA initiated, with the understanding that pre-school education should be based on play, discovery, cooperation within a group and not on educational activities directed subsequently towards the testing reading and pre-mathematical literacy (O'Hehir, 2010). Criticism and concerns over the course and focus of pre-school education has resonated in the USA for many years now, because according to it children spend time learning on the basis of normative teaching plans and during achievement of academic standards, instead of playing, exercising or developing their imagination (Miller & Almon, 2009).

Reflection of our results can also be based on comparison with the situation in the Czech Republic several years ago. Before planned approval, research was carried out with the goal of assessing the feasibility and effectiveness of implementation of compulsory education at nursery schools. The results indicate that even through this step was intended chiefly to help disadvantaged children; it actually had no effect on this group (Hůle et al., 2015). A similar pattern, which is also appearing in Slovakia, is relatively simple. For those who did send their children to nursery school, nothing will be essentially changed. There may

possibly be a slightly increased burden in relation to excusing absences from schooling. And for children from disadvantaged environments who should regularly attend, this will remain complicated. On the basis of previous experience, it will be difficult to enforce this duty on parents. Even though the state has prepared sanctions for parents who neglect this duty, through the institute of special child benefits. This reflects the same procedure as in the current compulsory school attendance; the parents only receive child benefits if the child fulfils its duty of compulsory school attendance (Stránska, 2019).

There is no doubt that the parent is an important participant in the education of pre-school age children. We also have studies, which delicately point out that the effects of pre-school education are overrated, particularly with regard to parents with a lower social-economic status, and we should also take these into consideration. According to the authors, pre-school education is evidently beneficial, but the intensity of its impact on the success of children at the next level of education fall hand in hand with parents who are less involved in working with the school and are also less educated (Cebolla-Boado, Radl, & Salazar, 2017). Education of children of pre-school age therefore means primarily influencing their parents, during which time it is evident that the more educated they are, the more effective cooperation in this area will be.

According to our results, middle-class parents have accepted the obligation of assuring education of their child a year before starting primary school. Today we know that education of children of pre-school age in Slovakia is one of the lowest in OECD and EU countries. It is even lower than the average in OECD countries, in all age categories, during which time we also register considerable regional differences (Vančíková, as cited in Hall et al., 2019). This means that the Slovak Republic currently has problems fully covering demand for pre-school education from the aspect of capacity and its implementation, which most parents will deal with by sending their child to nursery school may be as urgent a problem as supervising fulfilment of the obligation to send their children to nursery school or assure home schooling.

Conclusion

According to available data from registration for the 1st year of primary school, every 7th child has been insufficiently prepared for starting primary school in the last 5 years. The most frequent reason for this was zero or very occasional attendance at nursery school. Only 77% of children whose compulsory school attendance was postponed attended nursery school and arrived at repeated registration for primary school with similar problems due to which their compulsory school attendance had been postponed (Vančíková, as cited in Hall et al., 2019). From September 2021, all 5-year old children will be required to attend nursery school, unless the parent requests individual education (home schooling), which could affect the issue of the child's readiness to start school.

The presented research has shown that surveyed parents essentially do not have any issues in their attitudes. The question is, how would parents of children, for whose benefit this obligation is chiefly being implemented, would react. Our research did not cover this group and it would therefore be interesting to question them, or more precisely, to address parents who currently do not cooperate with nursery schools, with a lower social-economic status or education, within another research strategy. This presents another sub-topic of the issue of compulsory pre-school education in the viewpoints of parents, as an impulse to continue research.

Compulsory school education should support the development of children of pre-school age, regardless of their family or cultural background and promote equal opportunities in their education and overall development. The intensity of the positive impact of pre-school programmes within the meaning of each child's progress and how it thrives depends on the quality of these programmes. Following legislative amendment concerning this obligation, we should also devote attention to the quality of pre-school educational programmes in Slovakia and how prepared teachers are to realise them. It will be important to honestly reflect development and the tuition that available nursery schools provide, because the expected positive impact of pre-school education is conditional to its quality (Janta et al., 2016; Melhuish et al. 2015; Slot, 2017; Sylva et al., 2014), and this includes compulsory pre-school education. Some widely discussed topics in Slovakia in relation to this issue are the qualification of nursery school teachers, the numbers of children in classes and, according to Vargová (2021), the diversification of providers of compulsory pre-primary education. This education may also be provided by facilities that are not part of the network of schools and school facilities and under the administration of the Ministry of Education, which may limit the quality of the provided education.

However, the expected quality should take into consideration the attitudes of parents, should also reflect various cultures from which the parents originate and the uniqueness of parental visions. This is naturally preceded by becoming acquainted with and understanding the conditions that parents seek within the educational reality of nursery schools. Only then will it be possible to integrate these preferences into educational strategies at nursery schools and thereby also appreciate the benefits family brings to institutionalised education of their children.

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The Illusions on Digital Citizenship: What We Know and What We Do?

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Abstract:
Introduction: The purpose of this paper is to examine the relationship between the digital citizenship levels of information and communication technology teacher candidates and their user behaviours and habits in the digital world. The experimental work presented here provides one of the first investigations into a deeper understanding of misconceptions, problems, and deficiencies in digital citizenship and its sub-dimensions. Also, the study offers some important insights to bring solutions to the problems encountered in teaching the concept to individuals.
Methods: To reach the goal, a mixed-method approach was utilized. Participants of the study were 74 information and communication technology teacher candidates enrolling at a public university in Turkey. Data for this research were collected using Digital Citizenship Scale (Kocadağ, 2012) and the e-Citizen mobile application. A combination of quantitative and qualitative approaches was used in the data analysis.
Results: According to the research findings, it was established that the participants did not have sufficient awareness of the concept of digital citizenship in the sub-dimensions of digital security, digital health, digital rights and responsibilities, digital law, digital etiquette, and digital commerce. The digital citizenship levels of the participants in these dimensions obtained from the scale were not consistent with their digital technology user behaviours and habits. Considering digital access, digital communication, and digital literacy sub-dimensions, it was concluded that pre-service teachers had sufficient knowledge. Another research finding shows that the responses of the participants to the scales should be questioned and emphasizes the importance of using different data collection methods.
Discussion: It was specified that the average digital citizenship score of 74 information and communication technology teacher candidates participated in the study was found to be 262 and it was described as

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"Very Good." These results corroborate with the findings of a great deal of the previous works that show that digital citizenship levels of individuals have increased in recent years. However, data obtained from user habits and behaviours did not support this situation. This inconsistency may be due to the participants not acting objectively during scale scoring. The reason for this is not clear, but we thought possible causes maybe that teacher candidates may not express their real thoughts, may not want to get low scores on Digital Citizenship Scale (DCs) or they may see themselves as adequate despite their deficiencies. This situation is one of the biggest limitations of self-report measures and it is named "Social Desirability Bias" in the literature. There are, however, other possible explanations. In the study, participants have filled the DCs first and then used the e-Citizen application. Information and communication technology teacher candidates have taken lower scores from User Habits and Behaviours Surveys (UHBs) in each of the sub-dimensions compared to DCs. According to these data, we can infer that the participants may be able to increase their knowledge about digital citizenship and see their deficiencies thanks to the e-Citizen mobile application.

Limitations: It should not be forgotten that this study was limited by the validity and reliability of the digital citizenship scale, the efficiency of the mobile application, and the level of knowledge of the participant group and their objectivity in their answers.

Conclusion: Overall, this study strengthens the idea that there are problems in the concept of digital citizenship and its sub-dimension. As a result of the research, although the digital citizenship levels of the participants were measured to be very good, it was determined that there are inconsistencies with their behaviours and habits during the use of digital technologies in six of the nine sub-dimensions (security, health, rights and responsibilities, law, etiquette, and commerce). In three sub-dimensions: digital communication, access, and literacy, the data were relatively consistent. At the end of the study, the possible causes of the digital citizenship misconception experienced by teacher candidates were discussed separately and suggestions were made for future studies.

Key words: digital citizenship, e-Citizen, mobile application.

Introduction

Today's world is experiencing one of the fastest periods of progress and change in the history of civilization. The technology that causes this progress affects people in very different dimensions and pushes them to different habits of life (Görmez, 2016; Karaduman & Öztürk, 2014; Sakallı & Çiftçi, 2016). After digital technologies and the internet have started to play a significant role in people's daily lives, many people have been able to do most of their daily work in the virtual world, such as shopping, banking transactions, and tax payments

(Kaya & Kaya, 2014; Özer, 2016). Individuals can carry out their daily work through the digital world and interact with many different people, from inside or outside their own culture, using various communication tools, games, and virtual environments (Çubukcu & Bayzan, 2013; Engin & Sarsar, 2015). People can be parts of a global society by the help of technological possibilities (Engin & Sarsar, 2015). Nevertheless, this situation adds a different dimension to individuals' existing citizenship responsibilities (Elçi & Sarı, 2016; Görmez, 2016).

Each individual is regarded as an independent citizen in the digital world by public and private institutions, and these institutions impose many different obligations on people. These obligations that we encounter under the concept of digital citizenship are handled by researchers with minor differences but are generally defined as exhibiting behaviours that provide legal, ethical, safe, and responsible use of information and communication technologies in online environments (Görmez, 2016; Mossberger, Tolbert, & McNeal, 2007; Ribble & Bailey, 2007; Vizenor, 2014). Payne (2016) maintains that the implementation of legal and ethical behaviours in technology-related fields is the basis of digital citizenship. In a study conducted by Kabataş (2019), the basic principles of digital citizenship are expressed as (1) being respectful to themselves, others and intellectual rights, (2) protecting themselves, others and intellectual rights, and (3) educating themselves and others.

The construct of digital citizenship was first articulated by Marc Pensky in 2001, but over the past two decades, no consensus has been reached on the definition of the concept (Yalçınkaya & Cibaroğlu, 2019). Correlatively, in previous studies on digital citizenship, researchers have revealed very different results. Even in the same period of research, it has been observed that the knowledge of the participants about digital citizenship is at very different levels. It is obvious that the situation is not very different in terms of the sub-dimensions of digital citizenship. At a time when digital technologies are used in all areas of life, individuals need to be informed about the concept of digital citizenship, have sufficient awareness, and fulfill their responsibilities. Herein, first of all, it is necessary to reveal what problems are experienced in the field of digital citizenship in order to develop solutions. The experimental work presented here provides one of the first investigations into a deeper understanding of misconceptions, problems, and deficiencies in digital citizenship and its sub-dimensions. Also, the study offers some important insights to bring solutions to the problems encountered in teaching the concept to individuals.

1 Theoretical background

1.1 Digital citizenship and its sub-dimensions

Digital citizenship is defined by Ribble and Bailey (2006) as behavioural norms for the use of technology. Mossberger et al. (2007), on the other hand, explained digital citizenship as the ability of individuals to join society online. Recent studies mostly defined digital citizens as people who can use the internet regularly and who know their rights and responsibilities on the internet (Choi, 2016; Thomas, 2018). The definition of digital citizenship has changed over time. Previous research has established that the definition of the concept focused on the use of digital technologies in the early stages. But then, many recent studies have shown that the focus has been on the responsibilities that arise during the use of digital technologies. At this point, the importance of dimensions related to the digital citizenship concept has been understood because digital citizenship had a structure that could be handled from many different perspectives.

To better understand the concept of digital citizenship, Ribble and Bailey (2007) examined this subject in nine sub-dimensions. The definitions made by Mike S. Ribble and Gerald D. Bailey are generally accepted by the researchers and it has been stated in the literature that these nine sub-dimensions are the basis of the concept of digital citizenship (Elçi & Sarı, 2016; Gazi, 2016; Görmez, 2016; Kaya & Kaya, 2014; Vizenor, 2014). Ribble and Bailey (2007) labeled these sub-dimensions as (1) digital access, (2) digital commerce, (3) digital communication, (4) digital literacy, (5) digital etiquette, (6) digital law, (7) digital rights and responsibilities, (8) digital health, and (9) digital security.

In one well-known recent experiment, Buente (2011) associated digital citizenship with daily internet use and socio-demographic factors. In another study investigating digital citizenship sub-dimensions, Choi (2016) reported the four sub-dimensions as (1) ethics, (2) media and information literacy, (3) critical resistance, and (4) participation/engagement. Although there are different definitions in the literature, it is seen that the definitions made by Ribble and Bailey (2007) are taken as a basis in the research conducted on the sub-dimensions of digital citizenship.

1.2 Digital citizenship in education

In a situation where digital citizenship has become increasingly important for individuals in today's world, it has inevitably been considered in terms of education. Teaching the concept of digital citizenship correctly is the basis of training responsible digital individuals. The academic literature on digital citizenship has shown that researchers approach this concept in terms of both student's and teachers' perspectives. At this point, several researches have begun to determine the current level of knowledge of individuals about the concept of digital citizenship. To determine the digital citizenship level of individuals, various scales were developed by many researchers such as Karaduman (2011),

Kocadağ (2012), Oyademi (2012), Isman and Gungoren (2013), Elçi (2015), Öztürk (2015), and Choi, Glassman, and Cristol (2017). For instance, Oyademi (2012) developed a five-dimensional scale in the study of university students focusing on internet usage habits. In another research focusing on secondary school students, the scale developed by Öztürk (2015) has a single factor structure. Choi et al. (2017) developed a scale with 26 items and a five-dimensional structure in their studies with undergraduate and graduate students. In addition to these scales mentioned during the data collection phase, the researchers who conducted studies on digital citizenship also benefited from qualitative interview forms and questionnaires.

Numerous studies have attempted to explain how digital citizenship is perceived by students, teacher candidates, and teachers. In the research conducted by Karaduman and Öztürk (2014), sixth-grade students were made to take part in activities related to digital citizenship and its sub-dimensions for thirteen weeks. As a result of the study, it was stated that students' awareness about digital citizenship increased but a permanent result could not be obtained. In the same year, Çepni, Oğuz, and Kılcan (2014) observed that the opinions of primary school students about digital citizenship attitudes changed according to gender, the monthly income level of the family, internet connection at home, and frequency of access to the internet. Öztürk (2015), analyzed the data from sixth, seventh, and eighth-grade students and concluded that students commonly use digital technologies but do not have sufficient information about their rights and responsibilities in the digital world.

In the first of the studies in which teacher candidates or teachers constituted the research group, Kocadağ (2012) measured 0.36% of the participants had a very low level of digital citizenship and 33.32% were very good. In the research carried out by Kaya and Kaya (2014), also, teacher candidates have determined as the participant group. The researchers found that the vast majority of teacher candidates addressed the concept of “digital” and “citizenship” separately when defining digital citizenship and had difficulty in establishing the relationship between the two terms. In another article, Engin and Sarsar (2015) reported that the teacher candidates' knowledge and skill levels required by digital citizenship are not high enough. Unlike the previous research results, Sakallı and Çiftçi (2016) concluded that the digital citizenship levels of the teacher candidates were high. Similarly, Gazi (2016) showed that the awareness of the participants regarding digital citizenship and digital citizenship knowledge improved. On the other hand, in another study conducted in the same period as these researches, it was found that most of the teacher candidates had not heard about the concept of digital citizenship, despite using the internet for an average of four and a half hours a day (Özer, 2016). In a similar vein, Görmez (2016) measured that the participants did not have a satisfactory level of knowledge about the concept of digital citizenship. In the recent study carried out by Kabataş (2019), it was determined that teacher candidates’ digital citizenship levels are very good.

Of late years, researchers attempted to evaluate the impact of the sub-dimensions of digital citizenship to individuals. In 2018, Choi, Cristol, and Gimbert (2018) reported that teachers only had a high level of knowledge in digital communication and digital literacy sub-dimensions. As a result of the study conducted by Vural and Kurt (2018), it was concluded that the teacher candidates were good in some sub-dimensions of digital citizenship, and in other dimensions, they did not have sufficient information. Based on their results, researchers have suggested that studies should be carried out, especially in terms of digital health and digital rights and responsibilities. Takavarasha, Cilliers, and Chinyamurindi (2018) observed that the participants had problems in the digital security dimension. Similarly, Yalçınkaya and Cibaroğlu (2019), working on the sub-dimensions of digital citizenship recently, emphasized that the participants have deficiencies, especially in digital health.

1.3 Problems in digital citizenship education

Adopting the concept of digital citizenship from an early age and raising awareness on this issue is important in terms of both reducing the problems that children and young people can experience in a virtual environment (Karaduman & Öztürk, 2014; Palfrey & Gasser, 2011) and developing this culture. Researches especially emphasize the importance of helping students to be the right digital citizen (Farmer, 2010). Hollandsworth, Donovan, and Welch (2017) indicated that digital citizenship should be taught at a young age, and it is important to raise awareness of digital citizenship among educators and administrators. Accordingly, teachers, administrators, technology leaders, and parents should be supported to obtain the information they need to use digital technologies correctly (Gazi, 2016). It should not be forgotten that especially teachers have a big role in informing students and young people correctly. Given all that has been mentioned so far, one may suppose that teacher candidates' and teachers' awareness about digital citizenship is insufficient in the early studies, whereas in some studies conducted between 2015 and 2017 this situation has changed in a positive way. However, in recent studies, the researchers focused on the sub-dimensions of digital citizenship and they showed that the participants still do not have enough information about the concept of digital citizenship.

Many recent studies (Engin & Sarsar, 2015; Kabataş, 2019; Kaya & Kaya, 2014; Özer, 2016; Takavarasha et al., 2018; Vural & Kurt, 2018; Yalçınkaya & Cibaroğlu, 2019), have shown that the level of perceptions of teacher candidates and teachers' digital citizenship concept is still a problem. As for the sub-dimensions of digital citizenship, it is obvious that although there is an increase in the number of recent studies, it is still not sufficient. On the other hand, the vast majority of studies on digital citizenship have been quantitative and much of the research has focused on evaluating the scales. In some studies, scale evaluation results were supported by qualitative interview data. However, at the

stage of collecting data, no different approach was taken. This situation makes it difficult to determine where the deficiencies in the concept of digital citizenship and its sub-dimensions originate from. In addition to these mentioned problems, another remarkable point is that no solution has been proposed other than adding this concept to the curriculum to overcome the lack of information about digital citizenship.

1.4 Research questions

In light of the problems mentioned in the previous section, the main purpose of this study is to determine the digital citizenship levels of ICT teacher candidates and to compare them with their user behaviours and habits in the digital world. In line with the determined basic purpose, answers to the following research questions were sought:

1) What is the level of digital citizenship of ICT teacher candidates?
2) Do the digital citizenship levels of ICT teacher candidates and digital technology usage behaviours and habits show similarities?

2 Methodology

2.1 Research design

A mixed-method approach was used to obtain further in-depth information on problems and deficiencies of digital citizenship. This method is particularly useful in studying the use of quantitative and qualitative data together. Within the scope of the research, the digital citizenship knowledge levels of the participants were determined by the help of a Digital Citizenship Scale (DCs). Then, participants were asked to examine a mobile application called e-Citizen, which explained the concept of digital citizenship and its sub-dimensions. The data gathered from the e-Citizen mobile application about participants' user behaviours and habits on digital technology was stored in a database. In research, firstly, the process of collecting quantitative data, and then qualitative data was carried out. However, qualitative data were not planned to support quantitative data. For this reason, "Transformative Sequential Design" was chosen as a research design within the mixed method. The transformative sequential design allows the data to be collected in quantitative-qualitative or qualitative-quantitative order and to be combined in the analysis section.

2.2 Participants

Seventy-four participants studying at Computer Education and Instructional Technologies Department at Marmara University in the 2019-2020 academic year were recruited for this study. Just over half the sample (53%; 39 participants) was male and others female (47%; 35 participants).

2.3 Data collection tools

2.3.1 Digital Citizenship Scale (DCs)

Quantitative data were collected using the Digital Citizenship Scale (DCs) developed by Kocadağ (2012). The construct validity of the scale, which was developed to determine the digital citizenship levels of teacher candidates, was tested by Kocadağ (2012) through factor analysis. As a result of the exploratory factor analysis, it was determined that the scale consists of 63 items and 7 dimensions (Kocadağ, 2012). The scale's dimensions were expressed as follows: (i) digital communication and literacy features, (ii) digital etiquette and law features, (iii) digital access features, (iv) digital rights and responsibilities features, (v) digital health features, (vi) digital security features, and (vii) digital commerce features. The scale has a 5-point Likert type scoring system. Participants can get a maximum of 315 points and a minimum of 63 points from the scale. In determining the digital citizenship levels of the participants within the scope of their scores, the evaluation method put forward by Kocadağ (2012) is given in Table 1.

Table 1

Digital citizenship scale levels and score ranges

Level	*Score Range*
Extremely Week	63 – 98
Too week	99 – 134
Week	135 – 170
Intermediate	171 – 206
Good	207 – 242
Very Good	243 – 278
Extremely Good (Excellent)	279 – 315

2.3.2 Mobile application: e-Citizen

The e-Citizen is a mobile application developed by researchers to teach individuals the concept of digital citizenship and its nine sub-dimensions. In addition to being an educational application, the e-Citizen application allows us to detect some mistakes that individuals make in the digital world. In this way, qualitative data were collected using this application. HTML5, JavaScript, and Google Firebase technologies were used during the development of the mobile application. Sample screenshots of the e-Citizen application are given in Figure 1.

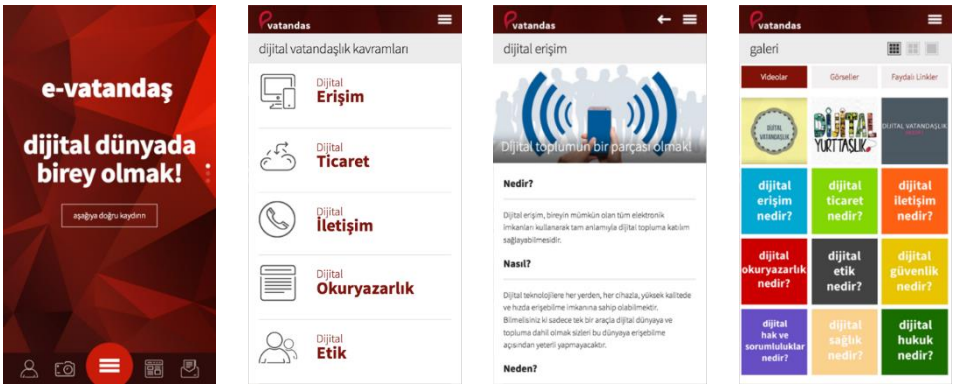

Figure 1. e-Citizen mobile application sample screenshots.

2.3.3 User habits and behaviours surveys (UHBs)

To determine the user habits and behaviours of the ICT teacher candidates on the digital world, short questionnaire items, and qualitative questions were added to the end of the lessons in the e-Citizen application. Some of the questions posed to the participants are open-ended, some are multiple-choice and some are designed in such a way that more than one option can be preferred. The questionnaire items and qualitative questions directed to participants were arranged to coincide with the items included in the Digital Citizenship Scale developed by Kocadağ (2012), thus, data diversification was made.

2.4 Data collection process

A scenario was designed to ensure the naturalness, neutrality, and accuracy of the data to be obtained from the participants. According to this scenario, the faculty member teaching the course of ICT teacher candidates; first asked a few questions that tested the students' concept of digital citizenship. Then she said that students can learn their level with the Digital Citizenship Scale. And, she applied the scale to those who voluntarily wanted it. Then, she mentioned that a postgraduate student has developed a mobile application named e-Citizen that provides digital citizenship education and this application was still in the testing phase. Also, she said that those who wanted can examine this application by installing it on their smart-phones, evaluate the contents, and increase their knowledge about digital citizenship. Finally, she mentioned that those who wish could give feedback on the application and content from the communication menu.

3 Findings

3.1 Digital citizenship levels of ICT teacher candidates

RQ1: What is the level of digital citizenship of ICT teacher candidates?

To determine digital citizenship levels of ICT teacher candidates, the Digital Citizenship Scale (DCs) was used. Table 2 shows the quantitative data on the digital citizenship levels of participants.

Table 2

Digital citizenship levels of the participants

Level	*Participants*	*Percentage (%)*	*Average DCs Score*
Extremely weak	0	0 %	0
Too weak	0	0 %	0
Weak	1	1.35 %	145
Intermediate	0	0 %	0
Good	11	14.86 %	227
Very good	43	58.11 %	261
Extremely good (Excellent)	19	25.68 %	290
Total	74	100 %	262

As can be seen from Table 2, digital citizenship levels of ICT teacher candidates were at a very good level with an average of 262 points. Considering the digital citizenship levels of all participants (n = 74), it was found that 83.79% of teacher candidates were at a very good and higher level, while only one (1) person was at the weak level.

The results obtained from DCs were handled within the scope of the seven sub-dimensions and it has been shown in Table 3. The lowest score and the highest score represent the minimum and maximum score that can be taken from the dimensions in the scale.

Table 3

Average scores obtained from sub-dimensions of DCs

Sub-dimensions	*Lowest Score*	*Highest Score*	*Participants' Average Score*
Digital Access	7	35	30.03
Digital Etiquette and Law	16	80	68.56
Digital Security	5	25	21.59
Digital Rights and Responsibilities	3	15	11.46
Digital Communication and Literacy	24	120	102.16
Digital Health	5	25	18.96
Digital Commerce	3	15	13.16

Table 3 provides an overview of the knowledge level of teacher candidates on digital citizenship sub-dimensions. It can be seen that the participants achieved the highest average in digital communication and literacy with 102.16 points and the lowest average in digital rights and responsibilities with 11.46 points.

3.2 Digital technology usage habits and behaviours of ICT teacher candidates

RQ2: Do the digital citizenship levels of IT teacher candidates and digital technology usage behaviours and habits show similarities?

Section 1

The process of determining the answer to this research question consists of two parts. Firstly, data that could shed light on the behaviours and habits of the participants were obtained during the installation and membership registration of the e-Citizen mobile application.

During the e-Citizen installation phase, the participants were asked to give permissions such as access to microphones, contacts, and photos which are outside the scope of the application. In this way, the knowledge levels and awareness of the ICT teacher candidates about digital security were measured. No information was provided to the participants during the request of these permissions. Whether the participants checked the access privileges requested by the mobile application was recorded based on their statements.

Table 4

Participants' status of questioning the permissions requested by the mobile application

	Number of Participants (%)
Those who check permissions	4 (5.40%)
Those who do not check permissions	70 (94.60%)

It can be seen from the data in Table 4 that 94.60% of the participants who used the application did not provide any feedback regarding the permissions. On the other hand, a minority of the participants (5.40%) asked researchers some questions about why these permissions were requested. These questions can be summarized as follows: “Why does this application require microphone access?, What is the purpose of reaching our contacts?” Also, one individual stated that the permissions requested did not match the purpose of the mobile application.

As with almost every mobile application, there was a "User Rights and Agreement" menu/window in the e-Citizen application. By the help of this menu/window, data were obtained to determine the behaviours and habits of the participants in the sub-dimension of user rights and responsibilities. The data as to whether the users have opened the agreement menu, and how long they remained on the screen if they opened the window, were recorded.

Table 5

Participants' status of reading "User Rights and Agreement"

	Number of Participants (%)	*Average Reading Time*
Those who read the agreement	2 (2.70%)	3,05 sec.
Those who do not read the agreement	72 (97.30%)	0

Table 5 shows that 97.30% of teacher candidates never opened the contract. Besides, the average duration of reading the agreement for the two participants was found to be 3.05 seconds. This result is somewhat counterintuitive.

Section 2

In the second part, the relationship between participants' digital citizenship levels and their user behaviours and habits in the digital world were analyzed using DCs and UHBs data. While the DCs questions utilized a 5-point Likert scale, UHBs questions were open-ended, multiple-choice, or designed in such a way that more than one option could be preferred. Therefore, to compare the data obtained from the DCs with the data obtained from the UHBs, a normalization study was conducted. Normalization allows comparing the data obtained from two different data collection tools evaluated with different scoring systems in a single frame. After the normalization study, the data obtained from DCs and UHBs were handled in the range of 0 to 1.

Two different questions were asked to the participants at the end of the digital access subject in the e-Citizen mobile application. Question 1: "Which of the following devices and digital technologies do you have?" and Question 2: “We think that you do activities such as research, homework, and exchange of ideas through digital technologies. So, which methods do you prefer?” The first graphic in Figure 2 shows the distributions of digital technologies that the participants possess. The relational results of the DCs and UHBs are given in Figure 3.

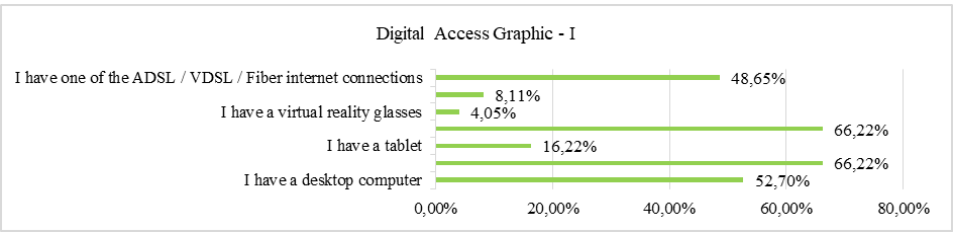

Figure 2. Distribution of digital technologies owned by the participants.

From the graph above we can see that 66.22% of the users had both a laptop and a smart-phone as a result of the data obtained by the UHBs but do not take place in the DCs. What is interesting about the data in this table is that 48.65% of users have access to the internet at home.

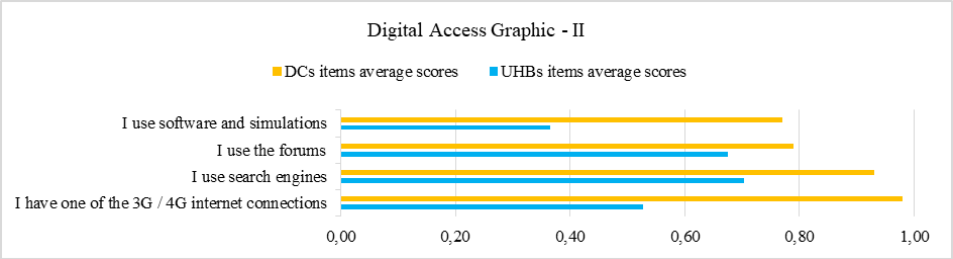

Figure 3. Relationship graphic in digital access sub-dimension.

As shown in Figure 3, it is seen that the habits of the participants in using search engines and forums were relatively consistent with the answers they give on DCs, but the data did not overlap with the use of software and simulations. On the other hand, it was determined that DCs and UHBs data did not show consistency in terms of participants having a mobile internet connection.
The questions posed to the participants within the scope of the digital etiquette dimension were as follows; Q1: "Which of the options below do you think should be considered within the context of digital ethics?" and Q2: "Well, which of the following do you think is not ethical?" Relational results are given in Figure 4.

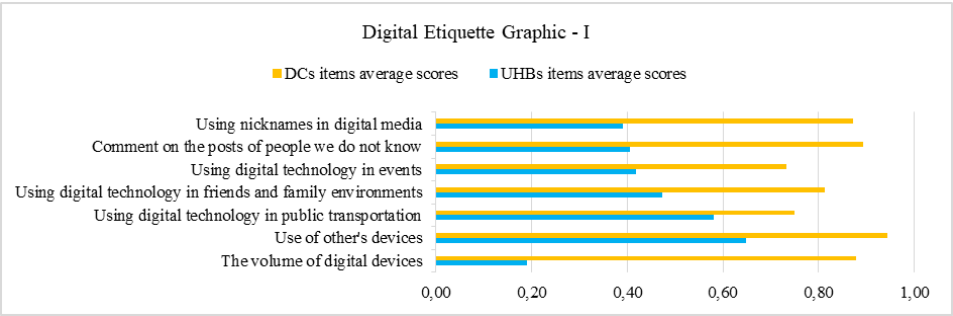

Figure 4. Relationship graphic in digital etiquette sub-dimension.

The figure above illustrates that the participants are relatively sensitive about the use of others' devices. On the other hand, from the data in Figure 4, it appears that there is a weak overlap between participants' digital citizenship levels and their user behaviours and habits on the usage of digital technology. ICT teacher

candidates have achieved high scores on the "I use my real name when communicating in digital media" item on DCs, but the majority of participants thought that using nicknames in digital media should not be considered within the scope of digital etiquette. A similar situation can be seen in other topics such as comments on posts of people they do not know or the sound volume of digital devices in society.

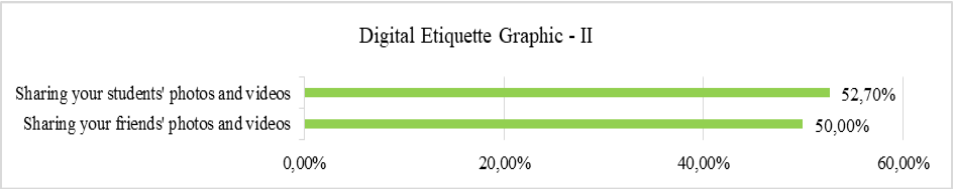

Figure 5. Digital etiquette data graphic.

As can be seen from Figure 5, the most striking result to emerge from the data is that only half of the teacher candidates think that sharing videos or photos of their friends and students without permission from them is ethical (50.00% for friends and 52.70% for students).

Two different questions were asked to the participants at the end of the digital law subject in the e-Citizen mobile application. Q1: “Which of the following concepts do you think you have sufficient knowledge about?” and Q2: “We carry out different works and shares with digital technologies every day. So, which of the following do you pay attention to?” The relational results of the DCs and UHBs are given in Figure 6.

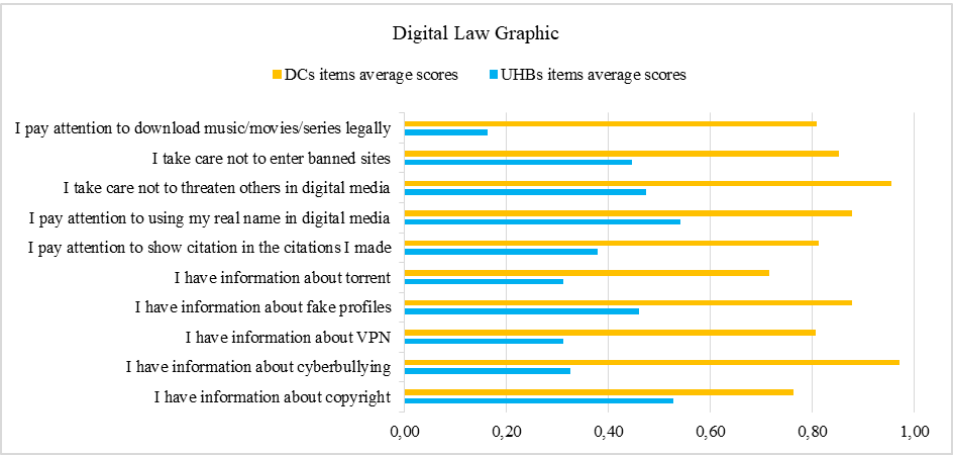

Figure 6. Relationship graphic in digital law sub-dimension.

Figure 6 shows that the scores given by participants to the digital law items of DCs are quite high. For instance, ICT teacher candidates obtained a high score (4.53) on the item "I take care to act under the laws set by the state in a virtual environment" in DCs. In contrast, in the answers given to the UHBs, it is seen that they are not sensitive enough about digital law. It can be seen from the data in Figure 6 that less than half of the participants stated that they were careful not to enter banned sites. Also, the rate of those who state that they have knowledge about cyberbullying is only 32.43%. At the same time, over one-third of the participants (37.70%) stated that they pay attention to referring to their studies, while the percentage of teacher candidates who said "I pay attention to downloading music/movies/TV series legally" is quite low (16.22%). These are remarkable results.

The questions posed to the participants within the scope of the digital security dimension were as follows; Q1: "We have listed some security protocols/concepts for you. Which of these are you familiar with?" and Q2: "Which of the following habits do you have when using digital technologies?" Relational results are given in Figure 7. In the second graphic in Figure 8, the distribution of the digital security concepts that the participants are familiar with is shown.

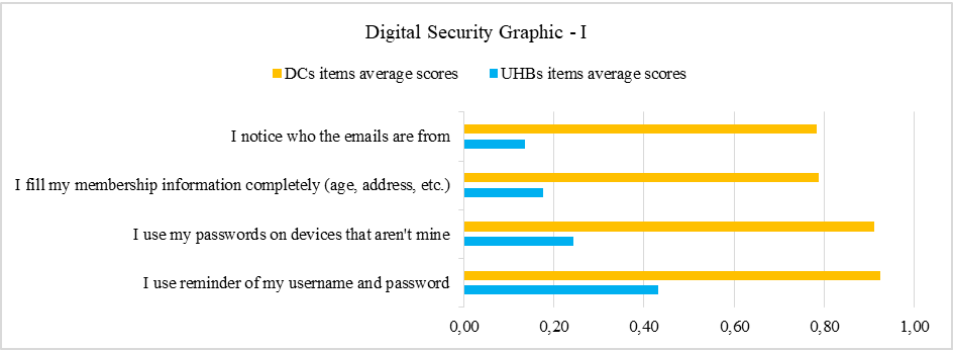

Figure 7. Relationship graphic in digital security sub-dimension.

From the graph above we can see that the scores given by the participants to the digital security items are quite high. However, there is a discrepancy between the participants' levels of digital citizenship and behaviours and habits on the usage of digital technology. To illustrate, only 17.57% of teacher candidates stated that they have completely filled their membership information on the websites. Although this is a positive situation in terms of digital security, almost half of the participants indicated that they use the username and password reminder feature on digital devices. Similarly, the percentage of participants said that they used their passwords on devices that did not belong to them was low

(24.32%), but the majority of teacher candidates (86.49%) stated that they did not pay attention who sent the e-mail.

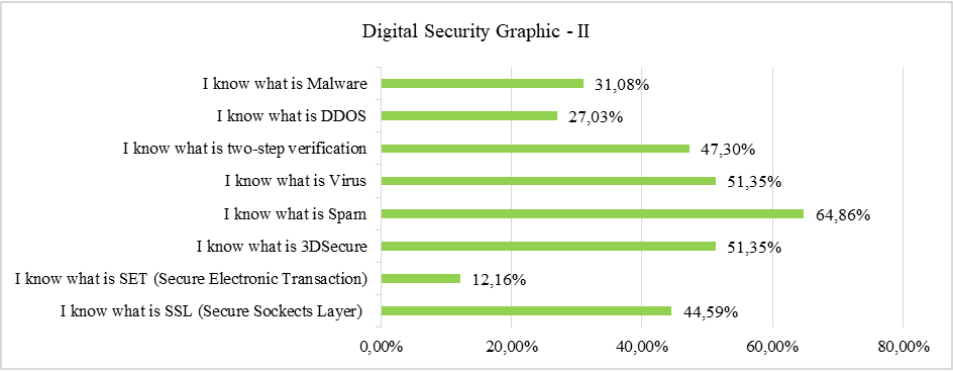

Figure 8. Relationship graphic in digital security sub-dimension.

Figure 8 shows an overview of the participants' awareness of digital security protocols. As seen in Figure 8 the participants partially know common concepts such as viruses, spam, and 3DSecure, but they do not have sufficient information about security protocols and security threats.

Two different questions were asked to the participants at the end of the digital literacy subject in the e-Citizen mobile application. Q1: "Which of the digital citizenship skills do below do you think you have?" and Q2: "So, which of the digital tools below can you use?" The relational results of the DCs and UHBs are given in Figure 9.

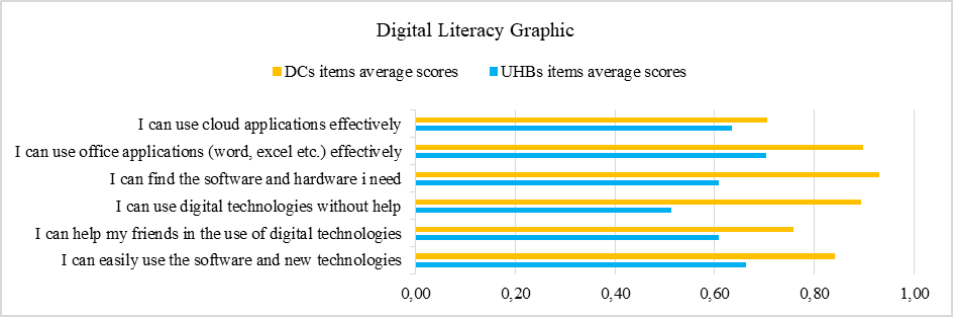

Figure 9. Relationship graphic in digital literacy sub-dimension.

As seen above from Figure 9, there is a consistency between the participants' levels of digital literacy and behaviours and habits on using digital technology.

The vast majority of participants considered themselves adequate about office applications and cloud applications.
The questions posed to the participants within the scope of the digital health dimension were as follows; Q1: “Some health problems experienced while using digital technologies are given below. Do you have any of these problems?” and Q2: “We can also say that digital technologies force people psychologically. Do you think that you are experiencing the following due to digital technology?”. Relational results are given in Figure 10. The distributions related to the health problems experienced by the participants are shown in Figure 11.

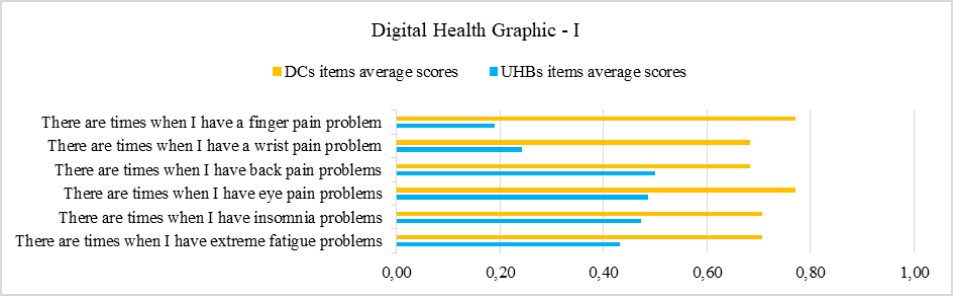

Figure 10. Relationship graphic in digital health sub-dimension.

It can be seen from the data in Figure 10 that the scores given by the participants to digital health items in DCs are relatively low compared to other dimensions. Nonetheless, participants have scored above the average for the item "I do activities that will keep me fit so that I do not experience uncomfortable situations such as fatigue, insomnia, distractibility during the use of digital devices". In contrast, in the answers given to the UHBs, the rate of those who stated that they had problems such as insomnia and excessive fatigue was 47.98%. Similarly, while the participants give a high score for the item “I will determine a correct sitting position when using a computer”, the participants who say they have problems such as shoulder, back, or eye pain are remarkably high.

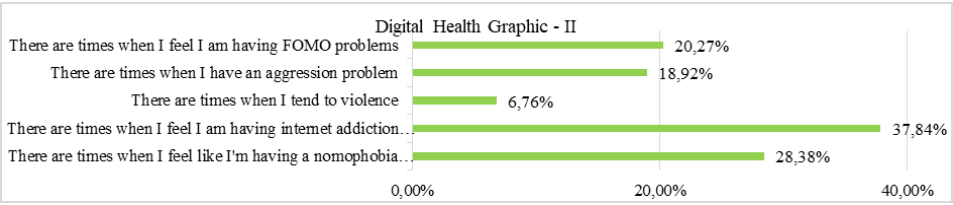

Figure 11. Digital health data graphic.

The results obtained from the analysis of psychological health survey data are summarized in Figure 11. As can be seen from figure 11, 37.84% of the participants thought that they were addicted to the internet, while 28.38% thought they had a nomophobia problem.

Two different questions were asked to the participants at the end of the digital commerce subject in the e-Citizen mobile application. Q1: "Which of the following trade and payment methods do you use?" and Q2: "Some components used in digital commerce are listed below. Which of these do you recognize?" Relational results are given in Figure 12.

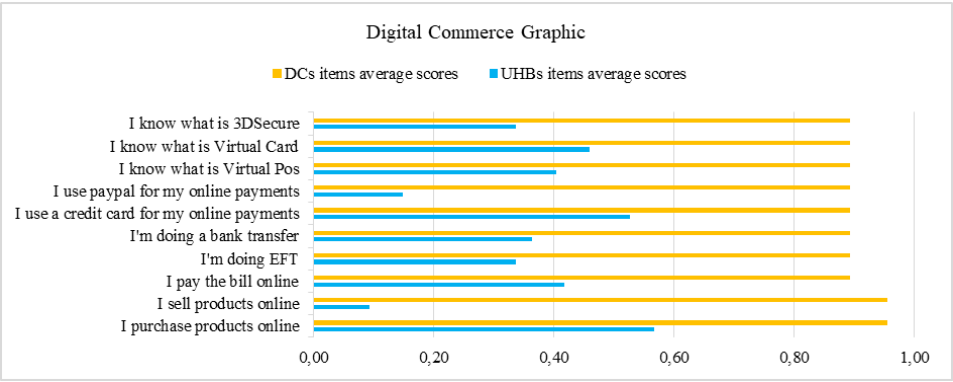

Figure 12. Relationship graphic in digital commerce sub-dimension.

As shown in Figure 12, the scores given by the participants to digital commerce items in DCs are quite high. A fairly above score (4.78) has given for the item that "I can do my online banking transactions, bill payments, and shopping when I need it" in the DCs by participants. However, in the responses given to the UHBs questions, it is seen that they do not perform banking transactions via digital ways or do not have enough information about this subject. Similarly, the data in Figure 12 shows that users have little knowledge of virtual shopping payment methods.

The questions posed to the participants within the scope of the digital rights and responsibilities dimension were as follows; Q1: "Do you pay attention to the one's factors while using digital technologies?" and Q2: "Do you know that you have responsibilities and rights against the mobile application you use?" UHBs items to determine user habits and behaviours in this dimension are not directly related to the items in the DCs. Since all three items in the DCs contain general expressions, the items in the UHBs were prepared per the content of the subject in terms of rights and responsibilities. The graph of the data obtained from the participants is shown in Figure 13.

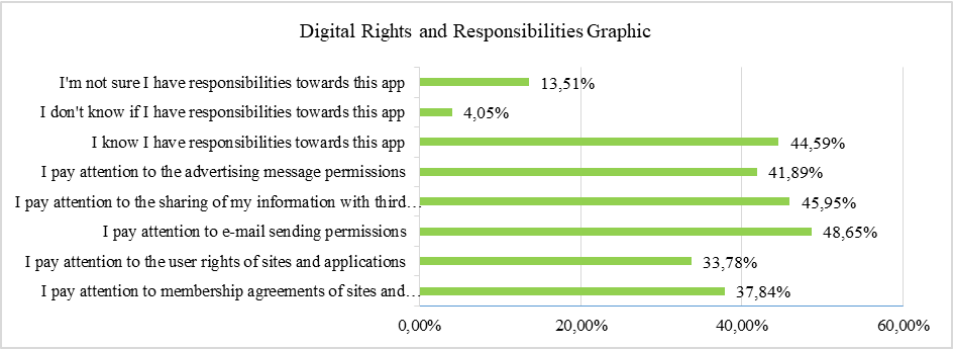

Figure 13. Digital rights and responsibilities data graphic.

In Figure 13 it is clear that participants do not pay attention to the membership agreements of websites and mobile applications. Similarly, just about one-third of the participants stated that they paid attention to user rights on websites and mobile applications. Besides, more than half of the participants (51.35%) do not pay attention to e-mail sending permissions. On the other hand, less than half of ICT teacher candidates (44.59%) know that they have responsibilities towards the mobile application (e-Citizen) they use.

Two different questions were asked to the participants at the end of the digital communication subject in the e-Citizen mobile application. Q1: "Which of the following digital communication channels do you use?" and Q2: "So which of the digital communication and sharing applications do you use?". UHBs items to determine user habits and behaviours in this dimension are not directly related to the items in the DCs. Since all three items in the DCs contain general expressions, the items in the UHBs were prepared per the content of the subject in terms of communication. The graph of the data obtained from the participants is shown in Figure 14.

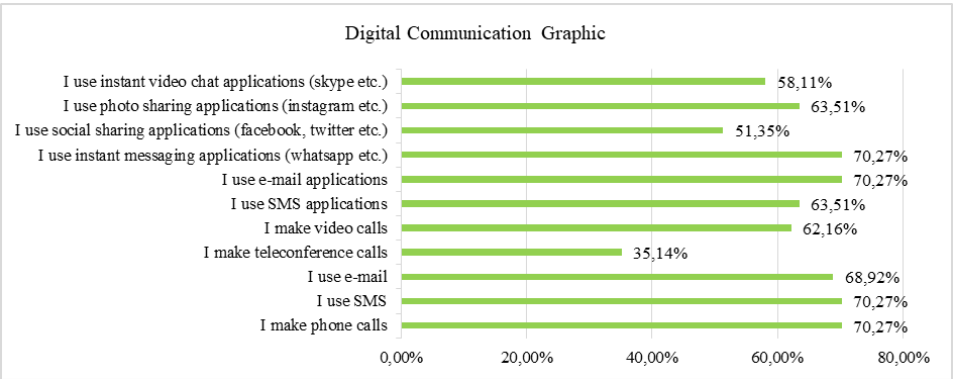

Figure 14. Digital communication data graphic.

As can be seen from Figure 14, participants use most of the digital communication technologies. In the digital communication sub-dimension, it can be stated that the participants have high awareness.

4 Discussion

4.1 Discussion

The main purpose of this study was to examine the relationship between digital citizenship knowledge levels of ICT teacher candidates and their digital technology usage habits. The results of this study were discussed in three sections. Firstly, the results of the digital citizenship levels of the participants were provided. Secondly, the details of the sub-dimensions showing consistency as a result of comparing the digital citizenship levels of the teacher candidates and the habits of using digital technologies were given. Lastly, the results of the sub-dimensions showing inconsistency were given.

In the first part of the study, it was specified that the average digital citizenship score of 74 ICT teacher candidates participated in the study was found to be 262 and it was described as "Very Good" according to the DCs. It is noteworthy that only one person from the participating group had a poor digital citizenship level. These results corroborate with the findings of a great deal of the previous works that show that digital citizenship levels of individuals have increased in recent years (Choi et al., 2018; Gazi, 2016; Kabataş, 2019; Sakallı & Çiftçi, 2016). A possible explanation for these results may be due to the participants' studying in the department of Computer Education and Instructional Technologies. Participants may have seen themselves very adequate in digital citizenship, which is a related topic to the field in which they are studying, however, data obtained from user habits and behaviours did not support this situation. This inconsistency may be due to the participants not acting objectively during scale scoring. The reason for this is not clear, but we thought possible causes may be that teacher candidates may not express their real thoughts, may not want to get low scores on DCs or they may see themselves adequate despite their deficiencies. This situation is one of the biggest limitations of self-report measures and it is named "Social Desirability Bias" in the literature (Erten, 2015; Porter, 2011). If such a possibility exists, the scales and answers filled by the participants will have to be questioned. There are, however, other possible explanations. In the study, participants have filled the DCs first and then used the e-Citizen application. ICT teacher candidates have taken lower scores from UHBs in each of the sub-dimensions compared to DCs. According to these data, we can infer that the participants may be able to increase their knowledge about digital citizenship and see their deficiencies thanks to the e-Citizen mobile application. It should not be forgotten that the mobile application was developed

to provide digital citizenship education, and at this point, it may have helped teacher candidates gain more awareness and see their deficiencies.

In the second part, the titles that showed consistency as a result of comparing the scores obtained by the participants from the sub-dimensions of the DCs and the habits of using digital technologies were examined. The results of this study indicated that in digital literacy, digital communication, and digital access sub-dimensions, participants' high scores on the DCs and the UHBs show positive consistency. For instance, it has been determined that the participants' habits of using search engines, software, and cloud technologies in the digital literacy dimension are high. These results are in line with those of previous studies that concluded that the participants are generally at a good level in digital literacy (Choi et al., 2018; Vural & Kurt, 2018). The relatively inadequate issue at the end of the research was the participants' use of new technologies without assistance. Nevertheless, when the participants were asked "what skills do you think a good digital literate should have?", the majority commented that a good digital literate should have skills such as "keep their data safely, follow the new technologies and developments, do have not a difficulty in accessing information, confirm the knowledge obtained from different sources".

Considering the user behaviours in the digital communication dimension, it was seen that the majority of participants had a good level of knowledge. This study confirms current researches (Torun, 2020) that students use digital communication channels and social media tools to a large extent and follow the developments. The participants on the whole stated that they preferred digital communication methods for reasons such as "saving time and cost, communicating quickly and facilitating accessibility". In the previous studies, Kocadağ (2012) combined the communication dimension with another dimension, Vural and Kurt (2018) stated that the communication dimension should be evaluated separately from digital citizenship. However, these findings may help us to understand the development of digital communication tools and the new problems they may pose. Young people who prefer digital communication methods should use these communication tools consciously and have sufficient knowledge about the problems they may encounter.

The current study found that digital access is another dimension that shows consistency between DCs and UHBs. According to the data, the vast majority of participants do not have problems accessing digital technologies and the internet. Besides, it was determined that the participants had access to many different digital technologies. This situation appears as a result of the increasing spread of digital technologies and becoming an indispensable part of life. There were some suggestions from participants about this dimension. Some ICT teacher candidates argued that "social media applications, cloud technologies, smart-phone reception" can be evaluated within the scope of digital access.

Finally, in the third section, the titles that showed inconsistency as a result of comparing the scores obtained by the participants from the sub-dimensions of

the DCs and the habits of using digital technologies were examined. Findings revealed that teacher candidates did not have enough information in six sub-dimensions of digital citizenship: security, health, rights and responsibilities, law, etiquette, and commerce, or do not display the correct user behaviour. For instance, the participants were careless about the requested permissions during the installation of the e-Citizen mobile application. Only four participants paid attention to this point. Similarly, although the DCs scores obtained from the digital security sub-dimension of the teacher candidates included in the study were high, they have shown that there were deficiencies in the user habits and behaviours in the security dimension. This finding is consistent with the results of Takavarasha et al. (2018) who revealed that there are problems in digital security. However, in this study, the sources of the problems were tried to be explained. According to the findings, the most striking result is that the basic habits of the participants, especially during the daily use of the technology, are wrong and they have insufficient knowledge about the security protocols. One of the main reasons behind these behaviours may be the idea that "it is not possible to be safe in the digital world" as the majority of the participants stated within the scope of the open-ended question. Another possible explanation is that the installation of a mobile application is now a daily routine. The main factor causing this routine is that mobile applications cannot be installed if necessary permissions are not given.

The most obvious finding to emerge from the analysis is that the vast majority of participants (97.30%) have not opened the user rights and agreement menu. Only two teacher candidates read the user agreement but it was recorded that their average reading time was 3.05 sec. This is an unexpected outcome. Similarly, as a result of the data obtained from the items in UHBs, it was determined that the participants did not have sufficient information about their rights and responsibilities in the digital world. These results support those of Vural and Kurt (2018) who also found that there was a problem with digital rights and responsibilities. The ICT teacher candidates stated the causes of the problems they faced in terms of digital rights and responsibilities with the open-ended question. A common view amongst participants was that user agreements on mobile applications or websites are not written in clear language. Only a small number of respondents indicated that they are not informed clearly by online platforms on the point of sharing information. These findings will be having important implications on efforts to improve awareness of user rights and responsibilities.

Another important finding was that there is also an inconsistency in the digital etiquette dimension. The results of this study indicated that the participants were not conscious enough especially of the use of digital technologies in society and cyberbullying. It is a striking result that only half of the participants do not find it ethical to share their friends' and students' photos/videos without permission. In some studies, in the literature, it is seen that the etiquette sub-dimension was

combined with different sub-dimensions and dealt with under a new dimension (Oyademi, 2012; Vural & Kurt, 2018). However, the findings of the current study do not support the previous research. The majority of participants agreed with the statement that they faced unethical situations in the digital world. For this reason, it is a fact that it is necessary to carry out more comprehensive studies on ethical sub-dimension. Besides, a possible explanation for these results may be the lack of information about the scope of digital ethics.

In the context of digital law, the knowledge of participants was insufficient as in the etiquette dimension. Surprisingly, a majority of respondents stated that they did not pay attention to refer to the quotations they made. Similarly, almost half of the participants indicated that they did not have information about copyright terms. Another important finding was that the rate of participating in illegal activities during the use of digital technologies of the teacher candidates was considerably high. Notwithstanding, the results of this study showed that participants' level of knowledge about cyberbullying was also insufficient. Vural and Kurt (2018) stated that the subject of digital law is not under any dimension in their research and this may be due to the fact that it is not yet aware of the legal regulations in the field of information technologies. The vast majority of teacher candidates stated that a separate law was needed for digital technologies and made suggestions on the topics that may be included in its scope. This finding broadly supports the work of other studies in this area (e.g. Vural & Kurt, 2018). At this point, there are two possible reasons why participants may have problems. A possible explanation for this might be that there is indeed a deficiency in the point of digital law. Another possible explanation for this is that the participants may have a lack of information about the regulations and laws.

On the dimension of digital health, this study found that most of the participants experienced physical problems such as shoulder, back, and eye pain, even though they scored very high on DCs. In addition to this result, 37.84% of the participants considered that they had internet addiction problems. Similarly, the participants believed that they had different psychological problems such as aggression, nomophobia, and FOMO. These results corroborate with the findings of a great deal of the previous works which reported identical problems in the digital health dimension (Vural & Kurt, 2018; Yalçınkaya & Cibaroğlu, 2019). There are several possible explanations for this result. One of the possible causes of these results is explained in the answers to the open-ended question addressed to ICT teacher candidates. The majority of those who responded to this item stated that there was a lack of information at an adequate level from the authorities regarding the conscious use of digital technologies. Another possible reason may be that the health problems experienced are ignored by individuals.

One unanticipated finding was that there was an inconsistency in the digital commerce sub-dimension. The participants' level of digital commerce was remarkably high according to DCs scores. However, the results obtained from

the UHBs items showed inconsistency with these high scores. The results of this study indicated that teacher candidates had insufficient information especially about security protocols in the digital commerce dimension. Another important finding was that participants do not have enough competencies to take measures against possible problems. As part of the open-ended question asked in the digital commerce dimension, the vast majority of the participants stated that they prefer "reliable shopping sites, take customer reviews and ratings into account" while shopping in the virtual environment. However, it is seen that there is a lack of information about the features of reliable shopping sites.

4.2 Future research directions

The findings of this study have a number of practical implications for digital citizenship. In light of the data described in the findings section and the possible problems mentioned in the discussion section of the study, some suggestions were made to guide the teachers, administrators, and researchers in future studies.

Adopting the concept of digital citizenship from an early age and raising awareness on this issue is important to the point of reducing the problems that children and young people can experience in the virtual environment (Karaduman & Öztürk, 2014; Palfrey & Gasser, 2011). Farmer (2010) stated that it is important to help students be the right digital citizen. At this point, the biggest share belongs to educators, namely teachers. But, firstly, teacher candidates and teachers should be good digital citizens. In this regard, educators should primarily conduct studies that can ensure their development. Then, they can contribute to students by developing awareness-raising educational content, activities, and applications on digital citizenship.

At the point of raising awareness of educators, the main task falls on managers. School administrators, university administrators, higher education institution officials, ministry officials, ministers, and other educational institutions of the state, which are in the management section of the education world, should carry out comprehensive and systematic studies to raise the awareness of teacher candidates and teachers about digital citizenship. According to the findings, a vast majority of participants indicated that they have not been informed by authorities about digital citizenship and its sub-dimensions. From this point of view, it is recommended that administrators prepare comprehensive and systematic information content and present these contents not only as printed material but also in the form of in-service training. Besides, the developed content can be supported by educational virtual projects, videos, augmented reality applications, and mobile applications. At the same time, these contents can be used as educational content not only for educators but also for all individuals in society. Studies to be carried out in this area may enable members of society to become digital citizens over time and systematically.

This study has gone some way towards enhancing our understanding of digital citizenship and its sub-dimensions. As can be seen in the current research, there are inconsistencies between participants' digital citizenship levels and their user behaviours and habits in terms of the concept. However, in many studies, it is known that only scales are used and in some studies, scale results are supported with qualitative data. The results of this study indicate that the participants may not make correct scoring in the scales or that they may lack what they thought they knew. It is recommended that researchers use different types of data collection tools during data collection for future studies. In this way, it might be possible to determine the behaviours of the participants in the real world by making data diversification. Also, further research needs to be carried out to determine how students can be effectively educated on the concept of digital citizenship. The e-Citizen mobile application was developed to provide digital citizenship education in the scope of research and the majority of the participants stated that they found the application informative and effective. In future studies, similar applications can be developed to raise awareness of participants on digital citizenship. Besides, there is not a consensus among researchers on the definition of the concept of digital citizenship (Yalçınkaya & Cibaroğlu, 2019). As stated by Hamutoğlu and Ünal (2015), to develop a full picture of digital citizenship, additional studies will be needed that determine the concept of digital citizenship and the right behaviours of a digital citizen. This is an important issue for educators, administrators, and researchers. Finally, further studies with more focus on sub-dimensions of digital citizenship are therefore suggested. Several studies have used the sub-dimensions of digital citizenship combined with other dimensions or excluded out of scope (Kocadağ, 2012; Oyademi, 2012; Vural & Kurt, 2018). However, the results of this study showed that there are big problems in six of the nine sub-dimensions. Although participants' knowledge level in the other three sub-dimensions seems relatively higher, there are deficiencies in these sub-dimensions as well. There are still many unanswered questions about the sub-dimension of digital citizenship.

Conclusion

The main question raised by this study is whether ICT teacher candidates' digital citizenship levels show consistency with their user behaviours and habits in the digital world. The research data in this paper were obtained from two main sources: The Digital Citizenship Scale and e-Citizen mobile application. By comparing these data obtained from two different data collection tools after normalization studies, analyses were carried out and the findings of the research were shared.

Overall, this study strengthens the idea that there are problems in the concept of digital citizenship and its sub-dimension. As a result of the research, although the digital citizenship levels of the participants were measured to be very good, it was determined that there are inconsistencies with their behaviours and habits

during the use of digital technologies in six of the nine sub-dimensions (security, health, rights and responsibilities, law, etiquette, and commerce). In three sub-dimensions: digital communication, access, and literacy, the data were relatively consistent. At the end of the study, the possible causes of the digital citizenship misconception experienced by teacher candidates were discussed separately and suggestions were made for future studies.

It should not be forgotten that this study was limited by the validity and reliability of the digital citizenship scale, the efficiency of the mobile application, and the level of knowledge of the participant group and their objectivity in their answers.

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Employment Status and Educational Achievements in Universities: Evidence from Southeast Nigeria

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Abstract:
Introduction: Educational achievement has remained the common yardstick for assessing human capital development across the world. However, it has been observed that Nigeria is one of the developing countries facing the challenge of low level of academic achievement by employees in the university system, which in turn has grave implications for the overall performance of the Nigerian university system in terms of efficient work delivery.
Methods: This study adopts a robust and stratified sampling technique to select 4,122 employees in selected federal universities in the southeast of Nigeria and uses structural questionnaire and binary logistic regression to analyse the effect of employment status on academic achievement in South East Nigeria.
Results: The findings show that employment status negatively and significantly influences the academic achievement of employees in Nigerian universities.
Discussion: The major focus of this study is to examine the impact of employment status on educational achievement in the universities for southeast, Nigeria. To drive more effective and efficient service delivery in the universities, there is need for adequate salary enhancement for employees in order to motivate them to strive for higher educational attainments.

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Limitations: The study was carried out in federal universities in Nigeria. It is expected to expand the study to cut across both private, states in Nigeria for effective and efficient comparison among the universities found in southeast geopolitical zones.
Conclusion: The study concludes that government should continuously motivate these employees so that they can strive for higher educational attainments.

Key words: employment, academic achievement, human capital development, binary logit regression model, Nigeria.

Introduction

The benefits of academic achievement for economic growth and development cannot be overemphasised. In underdeveloped countries like Nigeria, academic achievement is recognised as most prerequisite for appointment, promotion, job placement, employment status as well as a core value of assessment for human capacity and development. It is also used to measure the general knowledge individuals acquired through their exposure to research and learning in the university or other institutions of higher learning (IHL). According to Gordon (1984), academic achievement is described as academic degrees used to explain good reflections of ability, indicators of attitude, perseverance and effort. Academic achievement provide basis for institutional promotion and accreditation process in the university (Baverstock & Wenger, 2018).This study focuses on academic degree as an indicator for measuring academic achievement in the university. This indicator takes a value of one if an employee in the university possesses higher degree, while it takes a value of zero if otherwise.

It has been recently observed that employment status and academic achievement are two important issues affecting the academic calendar of universities in most developing countries like Nigeria. These issues are important because they have serious implications for the welfare of university workers, who have incessantly embarked on strike actions in recent years, thereby creating inefficiency in service delivery in the university system. Figure 1 shows the percentage distribution of academic achievement by employment status of workers Nigerian universities in Southeast, Nigeria.

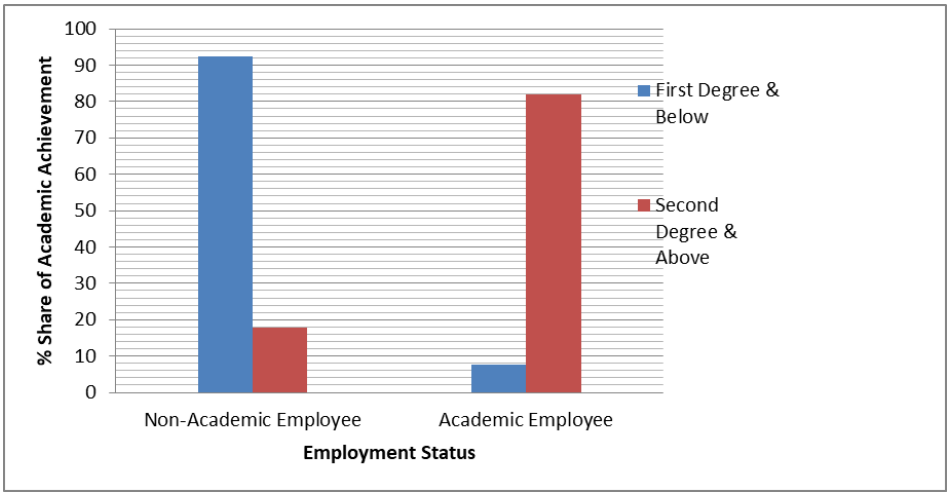

Figure 1. Author's computation on employee degree in Nigerian universities for southeast geopolitical zone using SPSS (Source: Author's computation on employee degree in Nigerian universities for southeast geopolitical zone using SPSS).

Figure 1 shows that the employment status for non-academic employees indicate higher share of academic achievement for the first degree and below than for the second degree and above. Figure 1 shows that 92.37% of non-academic employees had the first degree and below, whereas only 7.63% of academic employees had the first degree and below. Additionally, the employment status for academic employees in Figure 1 shows that academic employees have more academic achievement for the second degree and above than they have of the first degree and below. The percentage share of academic achievement shows that about 17.93% of non-academic employees had the second degree and above, while 82.07% of academic employees had the second degree and above. In general, Figure 1 illustrates that the employment status for academic employees on the average shows more of the second degree and above than for non-academic employees, while the employment status for non-academic employees indicates more academic achievement for the first degree and below.

The importance of academic achievement by university employees cannot be overstressed in the third world countries like Nigeria. The significance of academic achievement among these employees according to Quach & Mullineux (2006) includes: income acquisition through enhancement of salaries, improved standard of living and consumption. According to Dunn (2008), employment enhances self-esteem and makes the employee feel needed, valued, and appreciated. It also enables them to receive affirmations not easily acquired elsewhere. Furthermore, it provides financial freedom, inclusive growth and decision making power (Min & Xiaolin 2011). It is a stronghold for

sustainability of economic growth and development (Tripathi 2013). However, the issue examined in this paper is if employment status influences employee academic achievement in the universities. In general terms, employment is assumed to offer an adequate help for academic achievement, efficient service delivery, commitment to duty and full participation in the academic business of the university.

Despite the important role of employment in enhancing academic achievement among employees in Nigerian universities in the South-East, it has been revealed that overtime, the university system in Nigeria has failed to achieve a reasonable level of capacity building, intellectual capital as well as quality knowledge to drive the economy in the present dispensation (Iheriohanma, 2011). The systemic failure in the university system has seriously affected the university structure including human capital development of both academic and non-academic employees. The work environment in Nigerian universities has not been fair in terms of promoting academic achievement, research, teaching and human capital development. Indeed, most of the service periods available to the system are spent on strike actions and demonstrations by employees in the university. These incessant strikes among the employees in the university system have greatly affected the efficient service delivery and robustness of intellectual development among the employees in Nigerian universities (Osoba, 1996).

Adeniji and Adekunjo (2010) provided some insights on the purpose for establishing universities in Nigeria. They revealed that university is a citadel established for academic purposes, and that they should not be seen as separate entity from the larger society where they operate. They also revealed that the Nigerian university system operates with groups of individuals performing certain unique uniform roles to make the system efficient. For instance, academic employees are trained for imparting knowledge on students while non-academic employees execute the policies of the governing councils of the universities. This separation employment status into academic and non-academic were argued to have been the cause of major setback not only job efficiency but also willingness to attain higher academic achievements in the universities in most developing countries like Nigeria. A reasonable percentage of employees in the universities are not motivated in terms of promoting their career due to their poor academic achievement. This is because a greater percentage of workers still have limited academic achievement, which in turn may affect their morale and job performance. This issue has been found to constitute serious impediment against higher academic achievement by university employees.

Nigerian government has made enormous efforts through the execution of various policies to guarantee optimum academic achievement by employees of Nigerian universities. The National Universities Commission (NUC) was established as an advisory agency under the auspices of the Federal Ministry of Education. It was expected to be a channel for all external supports to Nigerian universities. Funding of the universities and payment of earned allowances and

minimum wage are the contributions from the government through the NUC to support employees of the universities in terms of income enhancement. The commission was established to monitor day to day activities of universities and promote academic achievement by the employees. These contributions from the government are aimed at ensuring that employees of Nigerian universities attain adequate academic achievement needed to meet up with global competitiveness. Despite these efforts by the NUC, it appears that employment status has not been able to provide the needed help to promote the academic achievement of employees in Nigerian universities.

1 Contributions to knowledge and value addition

Many studies in the current literature, particularly those from outside Nigeria (Arratibel et al., 2007; Min & Xiaolin, 2011; Tripathi, 2013; Biswas & Saha, 2014; Aoyagi & Ganelli, 2015; Georgescu & Herman, 2019; Aliyu, 2019; Lajčin, 2021; Semjén, Le, & Hermann, 2018) focused on how economic growth is influenced by employment. Biswas and Saha (2014), for instance, investigated how economic growth impacted by employment using aggregated data. In Nigeria, studies like Igbatayo et al. (2017) focused on the contributions of employment creation on inclusiveness of economic growth, but did not consider the effect of employment status on academic achievement. Other studies in Nigeria (Igboegwu& Okonkwo, 2012; Titus et al., 2016; Fredrick, 2011) examined the influence of gender and location on the academic achievement of students. These studies did not consider the important role of university degree as an indicator in measuring academic achievement using cross-sectional survey data. In addition, most of these existing studies employed time series data that have to do with aggregation effects. Thus, despite the growing literature on employment, the influence of employment status on academic achievement in Nigerian universities is yet to be investigated. It is the goal of this study to contribute to the literature by filling this gap.

Hence, this study departs from the extant literature by estimating the influence of employment status on academic achievement using cross-sectional data. The covariates included in the model are location, age, marital status, and years of service. These covariates were incorporated into the study not only to enhance the robustness of the estimates but also to provide the evidence required by policymakers to address issues that could motivate employees in Nigerian universities to strive for higher academic achievement. The remaining sections of this paper are prepared as follows. The section 2 of this study captures the general overview of literature review followed by data and method of analysis in section 3. The next sections after 3 which are sections 4 and 5 present the empirical results and the conclusion of the paper respectively.

2 Theoretical and empirical literature

Some theoretical perspectives that have been used to explain issues surrounding academic achievement include Social Cognitive Theory, Theory of Educational Productivity, Human Capital Theory and Signalling Theory. The Social Cognitive Theory as described by Goddard (2003) argued that an environment for which an individual found him or herself has great negative influence on academic performance. The theory also posits that the individual characteristics of learners have significant roles in their academic success. This implies that school climate, family background and the larger community play important roles in an individual's academic achievement. The theory posits that social support is relevant and it influences the improvement of academic achievement. This implies that the role of social support in students' academic achievement cannot be called negligible.

The Theory of Educational Productivity advanced by Walberg (1981) identified the core variables that are responsible for students' academic achievements. This theory claims that students' cognitive, behavioural, and attitudinal traits as well as their immediate psychological conditions affect their academic achievements. The theorist explained that core variables like student ability/prior performance, support, developmental/age level, quantity/quality of instruction, climate of classroom, home environment and exposure influence students' academic achievements. The theory established that exogenous factors strong influence students' academic achievements. The exogenous factors as explained by the theory include family background, ethnicity, and gender.

An important theory that relates education to labour outcomes is the Theory of Human Capital proposed by (Becker, 1993). This theory postulates that higher educational achievement increases the productivity of an individual, thereby enhancing job performance. The theorists argue that education creates marketable knowledge and relevant abilities for job performance. Thus, the higher the educational achievement of an individual, the more successful the individual becomes in the labour market with respect to income and work opportunities. Even though this theory has been widely acknowledged as an important instrument for explaining the relationship between educational achievement and labour market outcomes, it has also been criticized based on its assumptions. The theory is founded on absolute foresight, which means that employers will assess employees' abilities objectively and rationally based on their educational achievements (Cai, 2012). However, labour market situations are characterized by uncertainties, among which are imperfect knowledge of job seekers' characteristics, uncertainty of quality of schooling and imperfect information of future condition for demand and supply (Cai, 2012; Levhari & Weiss, 1974).

The Signalling Theory (also known as the Screening Theory) deals with information asymmetries that are not easily resolved in principal-agent relationships (Arrow, 1973; Spence, 1973; Stiglitz, 1975). It is built on the

premise that an employer's hiring decision is an investment decision. Employers carry out the recruitment decision under conditions of uncertainty. As such, when taking recruitment decisions, employers consider signals portrayed by the level of educational achievement or attainment of the job seekers. Hence, employment seekers forward signals about their levels of ability to employers through their educational achievement, while employers interview the job seekers' ability through the signals that their educational credentials transmit (Cai, 2012). Educational achievement, therefore, becomes a yardstick to measure quality and ability.

Some studies in the extant literature have examined the synergy between outcomes of labour market and educational attainment. For example, Thomas and Daniel (2009) examined the influence of education on job performance in the U.S. using meta-analysis. The study also accounted for demographic and socio-economic factors. Significant results were obtained for race, job level, gender and job complexity, as important elements in the education-job performance relationship. The study also revealed that educational level contributes significantly to certain job categories like managerial jobs, but contrarily contributes less for training programme jobs. In another study, Tentama and Abdillah (2019) revealed a significant synergy between academic achievement and employability. The study confirmed that the higher the academic achievement and self-concept, the higher the employability among graduate students, and vice versa.

However, some scholars have also found mixed results while investigating the employment-academic achievement relationship among college students. Dadgar (2012), Daniels (2016), Simón et al. (2017) and Muluk (2017) investigated the impact of paid employment on academic performance of college students. Despite different statistical techniques adopted by these studies in various study areas, they all found that part-time employment does not significantly affect the level of academic achievement of the sampled students. Contrastingly, García-Vargas et al. (2016) found negative significant influence of employment on academic performance of students even after accounting for other socio-economic and demographic factors.

Some studies in Nigeria focused on the influence of some factors such as demographic and socio-economic on academic achievements. Fredrick (2011), Igboegwu and Okonkwo (2012), Alade et al. (2014), Alordiah et al. (2015), and Titus et al. (2016) estimated influence of school location, gender and socio-economic status on academic achievements in Mathematics, Chemistry, Economics and Agriculture. These studies used descriptive statistics focused on students in both urban and rural areas in Nigeria. The findings of these studies show that male students performed better academically than female students, students from urban areas performed better than students in rural areas and students from households with high socio-economic status outperformed students from households with low socio-economic status. Some other empirical

studies done in Nigeria clearly shows that education is a critical component of human capital development (Madueme, Orji, Johnson, & Anthony-Orji, 2021; Orji, Ogbuabor, Iwuagwu, & Anthony-Orji 2020; Orji, Ogbuabor, Anthony-Orji, Okoro, & Osondu, 2020; Orji, Ogbuabor, Nwosu, Anthony-Orji, & Isaac, 2019). However, the influence of employment status on academic achievement of employees in Nigerian universities has not yet been investigated. This study seeks to fill this important gap in the literature.

3 Methodology and theoretical framework

This study is built on the Social Cognitive Theory. According to Goddard (2003), this theory shows that an individual and level of academic achievement depends on the environment. Essentially, the theorist draws attention to situations in which some individuals are not able to obtain any form of support from their immediate environment in their quest for higher educational achievement. This situation in which an individual experiences deprivation in their quest for advancing in knowledge due to lack of support from their immediate environment can greatly hamper human capital development and slow down capacity building in Nigerian universities.

When investment in capacity building is obstructed due to lack of social support, the trickledown effect is that universities will eventually face the challenge of moral hazard or adverse selection due to environmental failure. This failure could affect the general performance of employees in Nigerian universities. This suggests that employment status may be relevant in promoting human capital development in the universities. Thus, the theory shows that when an individual experiences deprivation arising from lack of support from their immediate environment, such deprivation could greatly influence academic growth of such individual. Such deprivations, even when the individual has the desire for higher educational attainment, lead to some of the serious problems facing universities in third world countries like Nigeria (Iheriohanma, 2011).

A time dimensional approach for cross-sectional survey data of Nigerian Universities chosen from southeast Geo-political zone which comprises five states, Imo, Enugu, Ebonyi, Anambra and Abiawere used in the study. The study used one federal university to represent each state. For instance, University of Nigeria, Nsukka for Enugu state, Nnamdi Azikiwe University, Awka for Anambra state, Federal University of Technology, Owerri for Imo, Alex Ekwueme University, Ndufu-Alike for Ebonyi , and Michael Okpara University of Agriculture Umudike for Abia state (NUC, 2020). The study employed structural interviewer administered questionnaire to capture information from employees in each of the University. The target objective of the survey is to ascertain quantitative information with respect to employment status and academic achievement among employees in the Nigerian Universities for the state in the Southeast geo-political zone of Nigeria. The data sampling technique for the study is stratified random sampling technique, the same sampling

approach adopted by (Adejare et al., 2020; Yolcu, 2020). However, the sample size of four thousand one hundred and twenty-two (4,122) employees was used for the study.

4 Model specification and results

The logistic regression model is a probability estimation model used when the controlled variable is a binary variable while the covariate variables are scale variables (Verbeek, 2004; Ojonta & Ogbuabor, 2021). Accordingly, this study used a binary logit model in estimating the response of employee academic achievement to employment status in universities in South-eastern part of Nigeria. Since the controlled variable of this study, which is academic achievement, is a measurement variable categorised into two forms (i.e. it is a dichotomous variable), this study adopted the modelling technique of Astari and Kismiantini (2019). In the binary logit model adopted for this study, is used to represent the academic achievement of employees in Nigerian universities, while Xi is used to show the set of covariate variables, which are either continuous or categorical variables. It is assumed in this study that every category of academic achievement is not an independent event. Hence, the binary logit model is labelled as two results for the measurement of welfare on how employment status is influenced. This implies, the estimation of binary logistic regression influences the chances that an employee i has one of the j mutually exclusive university degree (0 = without higher degree; while 1 = with higher degree). Hence, Justino et al. (2008), this chances can be presented as:

$$P(\pi_i = j) = \frac{1}{1+e^{-(z)}} \qquad (1)$$

where: Z= $\beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_p X_p$; $\beta_0, \beta_1 ..., \beta_p$ are regression parameters; $X_1, X_2 ....., X_p$ are explanatory variables, and π is the probability that an employee operates with a higher degree as an academic achievement.

All the variables in equation (1) are defined as shown in Table 1. These variables are also interpreted as follows:

X_1denotes LOC, which is the location of assignment in the university. This is measured by job functions of the employees in the university (Categorical variable: 1 if the employee is located in a non-direct teaching unit in the universities; 2 if the employee is located in a direct teaching unit).

X_2 denotes SX, which describes the gender of employee in the university (Binary: 1 if employee is male and 0 otherwise).

X_3 denotes MS, which describes the marital status of the employees in the university (Binary: 1 if the employee is married and 0 if the employee is single).

X_4 denotes AG, which is the age at the point of employment in the university. This describes how old the employee was when he was employed. The age is a binary variable, such that 1 shows that the employee was 35 years old and

above, while 0 shows that the employee was more than 35 years old at the point of employment.
X_5 denotes LOS, which describes the length of service of an employee in the university until retirement (Categorical variable: 1 if employee has spent 20 years and below in the service of the university, and 2 if the employee has spent above 20 years in the service of the University).
X_6 denotes EMP, which stands for employment status of the employee (Binary: 1 if the employee is an academic staff, and 0 if the employee is a non-academic staff).

Table 1

Coding of variables included in the Binary Logit Model

Variable Name	*Variable Label*	*Coding*	*Expected Sign*
Dependent Variable: Academic achievement	ACH(Y)	1= With higher degree 0=Without higher degree	Not Applicable
Independent Variables			
Location	LOC(X_1)	1= Non-Direct Teaching Units 2= Teaching Units	(+/-)
Gender	SX(X_2)	1= Male 2=Female	(+/-)
Marital Status	MS(X_3)	1= Married 2 = Single	(+/-)
Age	AG(X_4)	1 = Below 35 Years 2 = Above 35 Years	(+/-)
Year	LOS(X_5)	1=1-20Years 2=Above 20Years	(+/-)
Employment Status	EMP(X_6)	1=Academic Employment 2= Non-Academic Employment	(+/-)

Source: Author's computation on employee degree in Nigerian universities for southeast geopolitical zone using SPSS

Table 2 shows the share of teaching and non-teaching (academic & non-academic) employees by percentage in Nigerian universities. The table shows that higher degree category reported higher percentage for academic employees than non-academic employees for both male and female. Conversely, non-higher degree category shows higher percentage for non-academic employees than

academic employees. This implies that academic employees attained higher academic achievements than non-academic employees regardless of whether the employees in question were male or female. These are shown quantitatively in Table 2.

Table 2

Percentage share of academic achievement according to employment status

	Academic Employee				*Non-Academic Employee*			
	Male	*% Share*	*Female*	*% Share*	*Male*	*% Share*	*Female*	*% Share*
Higher Degree	828	81.1	499	77.36	776	62.73	648	53.16
Non-Higher Degree	193	18.9	146	22.64	461	37.27	571	46.84
Total	1021	100	645	100	1237	100	1219	100

Table 3 provides the results of the binary regression model on the influence of employment status on academic achievement of employees in Nigerian universities. The p-values of the Wald statistics for each covariate variable indicate whether the contribution of each covariate variable is significant at the 5% level or otherwise. From the table, the "p-value" column shows the variables that are contributing significantly to the predictive ability of the model at 5% level of significance. These variables are location, gender, marital status, age, year, and employment status. The dependent variable, which is academic achievement, is a dummy categorised as probability (Pr =1) if employee has a higher degree and Pr=0 if the employee does not have a higher degree.

Table 3

Logistics regression estimates of factors influencing academic achievement

Observation: 4122
Pseudo R-Square: 0.193
Correctly predicted: 70.1%
Dependent Variable: Academic achievement

Variables	*B*	*Std Error*	*p-value*	*Exp(B)*
Location	0.201	0.082	(0.015)**	1.222
Gender	0.346	0.073	(0.000)***	1.414
Marital status	0.926	0.086	(0.000)***	2.525
Age	-0.459	0.074	(0.000)***	0.632
Year	-1.500	0.133	(0.000)***	0.223
Employment status	-1.288	0.088	(0.000)***	0.276
Intercept	2.121	0.180	(0.000)***	8.341

Note: B.: Represents Coefficient Estimation
Std Error: Robust Standard Error
Exp(B): The Odd ratio computed as exponential of Coefficient
p-value: Computed for test of significance
***, ** Indicate the significance level at 1% and 5% respectively.

At 1% level, Table 3 shows that employment status significantly affects academic achievement in the universities using non-higher degree as base outcome. From the table, the significance (Sig) level determines the variables that contribute to the academic achievement. These variables are location, gender, and marital status. The results suggest that the higher the employment status is observed in the university, the lower the tendency that employee will achieve higher degree. This finding is in line with Agboola (2006). It is also in line with the study of Owolabi and Etuk-Irien (2009), which showed that age and years of service have negative influence on academic achievement. Thus, employment status has a negative influence on the academic achievement of employees in the university. The probability value of 0.000, which is significant at 1% level, shows that the year which represents year of service is another important factor. This result implies that the more the year of service, the lesser the tendency that the employees will have academic achievement, which is in line with the findings of Owolabi and Etuk-Irien(2009),which also established that location is an important factor influencing academic achievement. It is also in line with the study by Ganai and Muhammad (2013), who demonstrated that gender is relevant for academic achievement. The results are also in line with the findings of Busch (1995) and Ali (2013), which suggest that marital status positively and significantly influence academic achievement.

Conclusion

This paper estimated the impact of employment status on academic achievement of employees in the universities in Southeast, Nigeria. The covariate variables included in the study are location, sex, marital status, year of service, employment status and age. The findings indicate that three factors (including location, gender, and marital status) impact positively and significantly on academic achievement at the 5% level. In addition, it is also observed that employment status, age and years of service have negative and statistically significant influences on academic achievement. The main policy issue emerging from this study is that there is the need for the government to factor in location, gender, and marital status when making decisions about adequate funding and extension of service years, as well as the need to ensure adequate salary enhancement for employees in order to motivate them to strive for higher educational attainments, which will in turn drive more effective and efficient service delivery in the university system.

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Acta Educationis Generalis
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Submission of an article implies that the work described has not been published previously, that is not under consideration for publication elsewhere, that its publication is approved by all the authors, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language. The journal does not have article processing charges (APCs) nor article submission charges.

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Abstract. A structured abstract (15-20 lines) is required as follows:

a) Research study:

Introduction: context of the study, main research aims/questions
Methods: sampling, design, methods of data collection and analysis
Results: main findings
Discussion: relevance of findings
Limitations: limitations of research (e.g. sample size, range of participants)
Conclusions: explanations of obtained results, areas of further research
Key words: 3-5 words that describe key aspects

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Introduction: context of the review, background
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Methods: parameters and inclusion criteria, search strategy and procedures, methods of analysis
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Berndt, T. J. (1981a). Age changes and changes over time in prosocial intentions and behavior between friends. *Developmental Psychology, 17,* 408-416.

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