EDITORIAL BOARD

CONTENTS

FOREWORD

Dear Readers!

You have just started browsing the summer issue our Acta Educationis Generalis characteristic by number twos - number 2, volume 12, and year 2022. In this issue, research results from Hungary, Algeria and Turkey – three very different countries – are presented. Their unifying feature is the common goal - to reveal, find, and propose solutions for educational topics and issues in various types and at different levels of schools. We selected the following topics and authors:

The first study by Erika Homoki and Laura Tímea Nyitrai is entitled "The Teaching Dimension of Digital Education due to COVID-19 in the Light of a Survey in Hungary". The authors point out that in the information society, the stimulus threshold for learners has changed, which requires a novel education strategy. They examined the level of digital competence of public education teachers before the pandemic and during the second pandemic wave in Hungary. The pandemic revealed serious shortcomings in the level of digital competence development in both teachers and students. However, it also opened the way for catching up on both sides, but regional development differences and a lack of digital tools have widened the gap between students. The authors conclude that in the context of further improvements, teachers' advanced digital competencies can play the crucial role as they can represent the key to effective interactions with students and educational work.

The research study by Kübra Okumuş Dağdeler and Hakan Demiröz "EFL Instructors' Perceptions of Utilizing Mobile-Assisted Language Learning in Higher Education" deals with the issues of foreign language teaching using Mobile-Assisted Language Learning (MALL). The researchers aimed at identifying instructors' perceptions. Based on content analysis of the results of a qualitative research with the sample of 24 instructors working at different universities, the following benefits were revealed: learning at anytime and from anywhere, stronger students' interest, higher motivation and autonomy, and individualized and collaborative learning. MALL users also faced some challenges, such as weak internet connection and battery, time consumption in terms of preparing content for the class, classroom management problems and low digital literacy of both students and instructors. If the challenges are minimized, it will have a positive impact on education.

"English as a Foreign Language Teachers' Techno-Cultural Awareness Levels and Self-Reported Competencies" is the title of the study by İsmail Çakır and Yıldıray Kurnaz. The study aims to reveal techno-cultural awareness levels and self-reported competencies in secondary school EFL teachers. The results show that even though the participants have positive attitudes towards using technology in EFL classes, most teachers do not feel prepared. They call for in-service training programmes for their further professional development in the field and the authors also pointed out

the differences between the attitudes of novice and experienced teachers towards using digital technologies for language teaching.

A psychological but an important topic "Adjustment to School as the Predictor of School Burnout in University Students" is dealt with by Mehmet Buğra Özhan and Mehmet Boyaci. As accentuated by the authors, burnout emerges as a common problem during the university period when social competition and expectations from the individual increase, and daily life becomes increasingly complicated due to augmenting stress factors. The aim of this study was to examine whether the school burnout in university students can be predicted by adjustment to school. In the study, a correlational survey model was used. The sample of the study comprised a total of 334 students. According to the findings, students with high adjustment to university life experience less academic burnout. In this context, both individual and group work to be conducted by the guidance and psychological counselling units of universities gain importance. The authors consider particularly beneficial to conduct studies for adjustment to university life, such as psycho-education, group psychological counselling, or peer guidance.

In the study "Attitudes of University Professors towards Distance Education during the COVID-19 Pandemic", Souraya Hamida, Kamel Hazhazi, and Abdelhafid Kadri investigated into university teachers' attitudes towards distance education during the home-quarantine period in Algeria. The sample included 426 teachers from 37 universities across the country. The results indicate that distance learning can be adopted by both genders without any additional special features and also suggested that distance learning could be one of the promising pedagogical technologies for higher education in Algeria.

The field of pathological phenomena is dealt with in a current study entitled "Do Positivity and Sensitivity to Cyber-Bullying Decrease Cyber-Bullying?" by Adem Peker and Furkan Kasikci. The aim of the research study was to examine the moderate role of positivity and sensitivity towards cyber-bullying between cyber-victimization and cyber-bullying on the sample of 342 university students. It was found out that 35% of the participants were exposed to cyber-bullying and 1.4% were engaging in cyber-bullying. The results indicate that a decrease in positivity and sensitivity results in cyber-bullying behaviour, whereas an increase in positivity and sensitivity decreases cyber-bullying behaviour. In addition, the results provide useful information in the preparation of cyberbullying intervention programs.

Mathematics teachers are in the centre of attention in the study "Same Mathematical Structure, Different Design: How Does Task Format Affect Creative Problem-Posing Performance?" by Ercan Özdemir, Tuğrul Kar, and Tuğba Öçal. The purpose of the study was to investigate into the effect of task format on pre-service mathematics teachers' creative problem-posing performance. In this quantitative study, a figural and a written pattern related to daily life with the same mathematical structure were presented to participants and they were asked to write as many problems as they could. The only statistical difference was observed in the originality component. Moreover, it has been found out that some of the participants wrote similar problems in both tasks; however, the problems in the figural pattern were inclined to be more

difficult. It can be assumed that changing tasks' design can have an impact on creativity when performing them.

In their study, Fevzi Dursun and Özge Maviş Sevim investigate into demanding situations that foreign students experience in a new country. The study is entitled "Receiving Education in a Different Country: Challenges Encountered by Foreign Students and Proposed Solutions". The goal of the research study was to involve primary and secondary school teachers who had at least one foreign student in their class, to reveal their problems, and to propose solutions to these problems. The findings of the study reveal that the most basic problem experienced by foreign students is the language problem, which brings problems of adaptation to school, teachers and classmates. The majority of the teachers mentioned that these students need additional activities related to reading and writing. Orientation programs, language and literacy courses, family education, therapy for children, programs for foreign students and being taught by teachers. Currently, it is a topical issue as students from Ukraine experience the same problems in other countries because of the war.

The last study in this issue of the Journal is entitled "An Investigation of the Relationship between Prospective Teachers' Self-Management and Self-Control Skills, Metacognition and E-Mobile Learning Readiness Perceptions", written by Ali İbrahim Can Gözüm and Özden Demir. The authors accentuate that according to the results of the study, mobile learning readiness perception is positively affected by metacognition. Metacognition is positively affected by self-management and self-control skills. In the study, the effects of e-mobile learning readiness perceptions on both metacognition and self-management and self-control skills were discussed in accordance with the proposed model.

The Editorial office of Acta Educationis Generalis believes that the selected studies are interesting, topical and motivational for you - dear Readers and Authors - and will inspire you to carry out research in the presented fields.

Wishing you a nice and relaxing summer without diseases or suffering from war and with deep respect to you,

Viola Tamášová
Editor-in-Chief

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The Teaching Dimension of Digital Education due to COVID-19 in the Light of a Survey in Hungary

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Abstract:
Introduction: In the information society, the stimulus threshold for learners has changed, which requires a novel education strategy. Today, it is no longer what attracts students' attention that it was 20 years ago. In addition to the rapid development of ICT, public education cannot go either. We believe that advanced teacher digital competence can be one of the keys of finding common ground with students and doing effective teaching work.
Methods: In our research we examine the level of digital competence of public education teachers before the pandemic and during the 2nd wave in Hungary (2020 autumn). We examine the development of digital competence, student performance, and the effectiveness of education outside the classroom in the spring period based on teacher experience. Data from the completed forms were evaluated by using basic statistical indicators.
Results: According to the data received, the pandemic revealed serious shortcomings in the level of development of the digital competence of both teachers and students. However, it also opened the way for catching up on both sides. Teachers were already better prepared during the second wave, so they were able to solve education more efficiently. Regional development differences and a lack of digital tools have widened the gap between students.
Discussion: The COVID-19 pandemic has exposed these shortcomings in education. For here the process of teaching had to be placed in digital space from one moment to the next.
Limitations: The research shows data valid only for Hungary.
Conclusions: Expected result is the demonstrable development of competences.

Key words: Hungary, digital competence, digital education, COVID-19, extracurricular learning.

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Introduction

Over the past 20 years, the technical conditions of digital education have been developed in several programs in Hungary, just as in other European countries. The concept of digital competence has also been gradually introduced in the materials regulating Hungarian public education (243/2003. (XII. 17.) Korm. rendelet, 2003; 110/2012. (VI. 4.) Korm. rendelet, 2012; 5/2020. (I. 31.) Korm. rendelet, 2020) and the necessity of its development. However, the digital coercion transition, which appears to be well prepared on paper, nevertheless caused many problems in spring 2020, not only for schools, but also for families, who have taken over part of the school's function.

Hungary's Prime Minister announced that schools had switched to digital education on 16 March 2020 due to the COVID-19 virus. One day to the next, teacher digital competence has become extremely important and gaps in competencies and techniques were revealed. With the closing down of the educational institutions a decentralized situation emerged (Litvack, 2019; Haug, 2009). This situation requires a lot of innovations, creative solutions and digital competencies from both teachers and students in education. According to the theory of digital Darwinism, it is not necessarily the smartest and the strongest that survives, but the one who is best able to adapt to changes in his environment (Racskó, 2017; Kreutzer & Land, 2015) and this situation required that. From the teachers' point of view the digital pedagogy has not been developed yet, and it is widespread only in a narrow segment. The reason for this could be complex, although the tools have been available for some time, but due to significant territorial economic differences in the regions of the country, (e.g. network coverage), there has not been a time of necessity, which would have made the use of digital pedagogy mandatory, its incorporation into the learning process was slow. A large improvement in teacher digital competence can be seen, but student performance has declined. Eurostat's 2019 survey shows that Hungary's digital skills level is below that of other European countries (Table 1).

Table 1

The level of basic digital skills of the entire population in Europe (2015-2019) (Eurostat, 2021)

GEO/TIME	*2015*	*2016*	*2017*	*2019*
Iceland	:	:	85	85
Norway	80	75	77	83
Netherlands	72	77	79	79
Switzerland	:	:	76	77
Finland	74	73	76	76
United Kingdom	67	69	71	74

Sweden	72	69	77	72
Germany (until 1990 former territory of the FRG)	67	68	68	70
Denmark	75	78	71	70
Austria	64	65	67	66
Luxembourg	86	86	85	65
Estonia	65	60	60	62
Czechia	57	54	60	62
Belgium	60	61	61	61
European Union - 28 countries (2013-2020)	55	56	57	58
Spain	54	53	55	57
France	57	56	57	57
Malta	53	50	57	56
Lithuania	51	52	55	56
European Union - 27 countries (from 2020)	54	54	55	56
Slovenia	51	53	54	55
Slovakia	53	55	59	54
Ireland	44	44	48	53
Croatia	51	55	41	53
Portugal	48	48	50	52
Greece	44	46	46	51
Hungary	**50**	**51**	**50**	**49**
Serbia	32	:	39	46
Cyprus	43	43	50	45
Poland	40	44	46	44
Latvia	49	50	48	43
Italy	43	44	:	42
Turkey	23	28	34	36
North Macedonia	37	34	32	32
Romania	26	28	29	31
Bulgaria	31	26	29	29
Montenegro	:	:	50	:

From among the European countries with similar experience, only the basic knowledge of the Romanian and Bulgarian populations is worse than that of Hungarians, and the situation is similar among young people aged 16-24. According to the measurements, 68% of Hungarian young people (16-24) 68% have basic digital knowledge, while the EU average is 80% (Lehman, 2019) and there is no improvement in this area. Based on the data of previous years, it can be said that the basic digital knowledge of young people in Hungary has not developed, or even decreased (10%), compared to 2015 data (Eurostat, 2020). In 2015, 78% of Young Hungarians had basic digital knowledge, by 2019 this

figure had become 68%. In contrast, Romania and Serbia have seen an increase in the share of people with digital skills (Eurostat, 2020). This data could assume that Hungarian families can take the obstacles smoothly in digital education, since they can support each other, but the territorial differences were significant.
Disadvantaged pupils were also disadvantaged in terms of digital competence during the first wave. According to Nóra L. Ritók (head of the Foundation for the Support and Support of Disadvantaged Children and Families living in Extreme Poverty), even though the technical conditions necessary for the implementation of digital education are present in almost all Hungarian or disadvantaged families, e.g. smartphones, if there is a lack of knowledge on how to use them for educational and learning purposes. According to the head of the foundation, 20% of children did not join digital education in the spring, but this could be a higher proportion in distanced areas (Figure 1). The technical background alone is not enough to make digital education effective, there is presumably no space and tranquility for home learning, and there is a lack of basic skills that are essential for self-study.

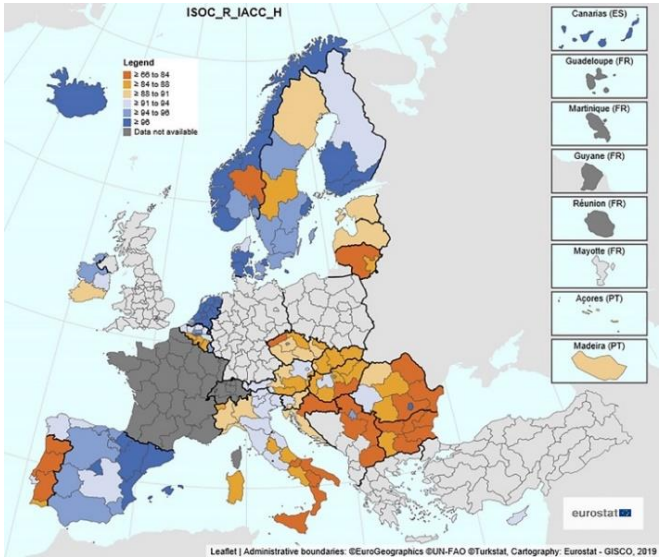

Figure 1. Households with access to the internet at home (https://ec.europa.eu/eurostat/databrowser/view/isoc_r_iacc_h/default/map?lang=en).

In the case of student digital competence deficiencies, we are talking not only about user problems, but also about the lack of tools in the absence of resources

in the first place. Thus, at the beginning of our research, we assumed that the individual differences in the level of digital competence would show quite a large territorial difference in the case of teachers and students, as well as in families. Reinforcing social segregation, digital segregation is emerging, which will have a strong impact on students' later lives, increasing the already huge social disparities but we will be able to study these effects in the future. In the absence of tools, an effective learning-teaching process in the online space is difficult to implement, almost impossible.

Marshall McLuhan (2001) was the first to say that, in addition to the rise of television, book-based teaching will become ineffective and irritable in education, so the new electronic culture should be put in the place of book culture. The generation that grows up on TV and socializes is already struggling to adapt to the traditional education and education system. McLuhan recognized this situation as early as the 1960s, which has become timely intensifying today. In addition to television, households were inundated with electronic devices that provided information. Phones and computers are almost standard equipment in a student backpack. This situation presents new challenges and expectations for education. This does not mean that book culture, writing or reading must be completely ignored, in our opinion, this is an essential condition for navigability in the media-centric information world. It is necessary to create an educational environment that provides space for innovative teaching methods for an effective teaching and learning process.

In addition to the family background, it is also important to talk about the fact that many educators only used the school's digital background to teach, because their own children used home devices. Thus, the school conditions also severely limited the possibilities of teachers. According to an international survey, which uses questionnaire and interview methods to draw an idea of the situation in Hungary in 2019, the supply of our schools is far below the EU average at all levels of public education. The difference is more than 50% (European Commission, 2019). In addition, the ever-renewing smart devices, if any, are not the most modern, fastest types, because the market cannot be tracked so quickly by public education and neither can families (Medzini et al., 2014).

Another important aspect is the tools that students have. In this area, too, we can say, based on national and international research results (Figure 2), that the situation is not satisfactory (Századvég, 2021; European Commission, 2019). Based on the research results of Századvég, 87.3% of the participants used their own device in the digital learning environment. Only 1.8% of the school received tools to get through digital education. The loss of jobs and reserves caused by COVID-19 also did not support the possibility of replacing the assets.

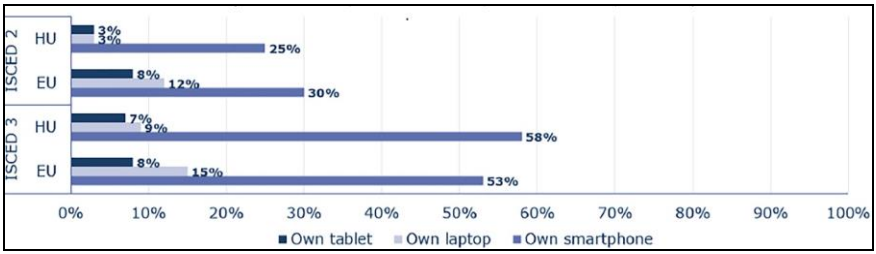

Figure 2. Own equipment used for learning during lessons ISCED 2 and 3 2017-2018 (European Commission, 2019).

Based on the survey, differences in issues relating to the quality of digital competences for parents, teachers and pupils were not as significant as for issues relating to the supply of tools, in fact, responses to parents had higher results than the EU average (European Commission, 2019).

ICT as a formal definition of the European Union, expresses the convergence and integration of information technology and electronic communications (Nemzeti Fejlesztési Minisztérium, 2014). ICT includes tools, applications, technologies and the effective application of the listed units from state level to individual level. Question is, what we mean by digital education? Digital education is not primarily about the use of tools, but about the strategy and management of information provision (Nicholson, 2000; Racskó, 2017).

According to György Molnár (2018), in an ever-changing and evolving world, the scientific mission of digital pedagogy is to explain the challenges, innovation opportunities and tasks which today's digital citizens are faced with. The key to prosperity in the digital world is the acquisition and effective application of digital competences. One of the main protagonists in education is the teacher, who, in addition to his existing knowledge and competences, must constantly acquire new skills and knowledge to create a learning environment adapted to emerging needs. A high level of knowledge transfer should be ensured in line with the increasingly computer and Internet-centric approach of learners (Racskó, 2017).

It is also necessary to incorporate new innovative opportunities in geography education. In the field of digital education, we would prefer real-time observations and measurements to analyze data, but we are not fully prepared for this even in teacher training, let alone in public education. We suspected that teachers who had already been given insight and could test themselves in the digital education space more and more easily use these techniques in their teaching process (digital techs, remote sensing, etc.) (Curtis, 2019; European

Commission 2019), as has already been confirmed by other foreign investigations (Medzini et al., 2014; Ávila et al., 2020).
In the research, the following groups of questions are framed as the answer:
- questions related to teacher actions in digital education,
- student performance questions,
- questions about teacher digital competence.

Our hypothesis is that teacher digital competence has evolved during digital education (will be judged to be at least 5% better), and student performance in digital education may vary nationwide depending on how economically advanced (GDP per capita by county) the county is where the student lives. Our hypothesis was based on the following sentences. Economic and social development is closely linked. In more developed counties, GDP is much higher, and the number of graduates is much higher than in economically underdeveloped counties (Nemes, 1997). GDP and graduate ratios are related to differences in student performance in each area. Outstanding student performance is found in the north-west counties of the country and is mainly seen in the metropolitan agglomeration. Low student performance is observed in the north-eastern counties and in the southern part of Transdanubia (Figure 1) (Hegedűs, 2016).

1 Materials and methods

For the research, we prepared two questionnaires. With the first questionnaire, we assessed the experience of the digital competence of students and teachers before digital education in the spring, and the experience of the second in digital education, and we examined the extent to which teachers' digital competence has developed. The second questionnaire was launched at the beginning of the 2020/2021 school year.
Compilation and evaluation of the questionnaire was based on the theories of Babbie's (2001) and Lengyelné's (2013) research methodology. The questionnaire was created using Google forms, so it was available online. The form consists of 22 questions, of which 3 are open ended and 19 are closed partly by comparative ranking and partly by semantic differential scale (Babbie, 2001). We used a Likert scale for requesting teachers' opinions and attitudes. Teachers took part in filling in the questionnaire.
Selection was random (Babbie, 2001; Vitál, 2006). With a confidence interval of 95% accepted in pedagogical research, the sample was compiled with a 5% margin of error in mind. In the survey we reached 173 people. The arcs would have been suitable for researching social contexts on the basis of status issues: social stratification (age, workplace, residence, geographer previous education etc.), however, the geography degree could not be analysed on the basis of the replies received. Processing done with Excel, SPSS 21.0. During the analyses,

basic statistical indicators (standard deviation, mode, distribution)), significance test to detect correlations ($\chi 2$-test) (Ketskeméty & Izsó, 2005) and analysis of variance was performed between the parameters given by the status questions and the responses.

1.1 Sociometry data of the sample

36% of the teachers completing the questionnaire teach in primary school (ISCED 2), 22% in secondary school (ISCED 3), and 21% in lower secondary school (ISCED 1A) (Figure 3). Almost a fifth of fillers (22%) work in other types of educational establishments, e.g., vocational schools, or higher education institutions. (ISCED 3-4) (European Commission, 2021). The fillers have been working as teachers for an average of 22 years.

There were 75,428 teachers in primary schools in 2019, while the number of secondary and vocational school teachers was also lower than 35,376 (Central Statistical Office, 2019). Therefore, the results of the study show the picture of primary and secondary education.

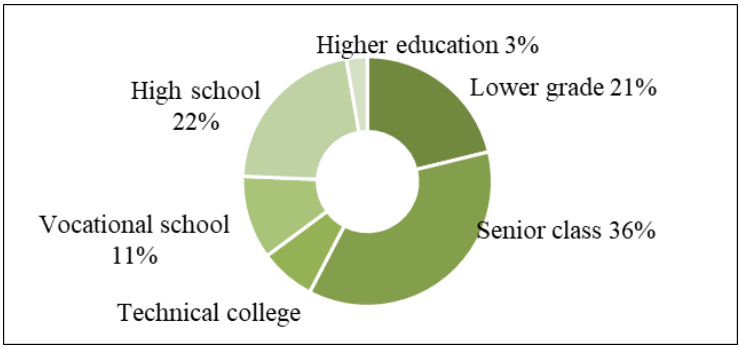

Figure 3. Respondents' workplace.

In terms of territorial distribution, 28% of the forms was sent back from Tolna County (Figure 4). The questionnaire was sent out from Tolna county, so a larger number of respondents was expected compared to the other counties. Pest County and Budapest have an extremely high completion rate: 21%. The fewest number (1 person) came from Hajdú-Bihar County (Figure 4). The county-level fill rate showed too much variance, so we were only able to partially conduct regional surveys.

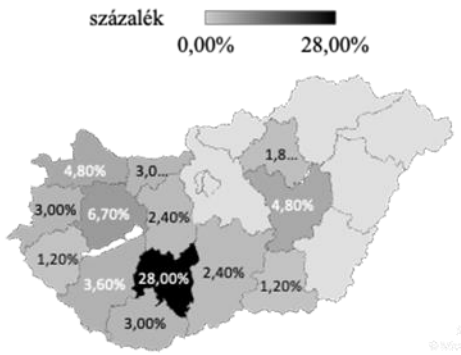

Figure 4. County-wide distribution of respondents.

2 Results

2.1 Teacher aspect of digital education

Almost half (49%) of the teachers, who filled in the questionnaire, used Google Classroom, the online interface to connect with students (Figure 5). This educational tool is included in Google Apps education suites. This educational tool is included in Google Apps education suites. One of the reasons for the high rate is that this platform has been available since 2014 and was already known to many teachers. It is free of charge and easy organization and collection of tasks contributed to the success of the application. In addition to Google's digital classroom, 12% of teachers did their teaching and teaching related work through Facebook. The teachers we interviewed, who chose Facebook, said that they can communicate the most and it provides the fastest way to communicate with students, and for both the teacher and the student, it is one of the easiest-to-use interfaces. It seems a convenient solution, but social media has often distracted students from other content. According to social psychologists Jonathan Haidt, researchers in many cases consider social media as sugar. If consumed in small amounts, it is harmless, but if children get it in high doses, then it is harmful (Haidt & Allen, 2020). With this solution, teachers opened the way to harmful stimuli, which could have harmed students' mental health. Teams and Kréta (Basic System of Public Education Registration and Studies) system were marked in 11-11% by teachers (Figure 5). 3% of the fillers worked on multiple surfaces at the same time e.g.: Moodle, E-mail, Redmenta, Skype, Zoom. One third of the students accessed the listed interfaces from a mobile phone, two thirds from a tablet or computer.

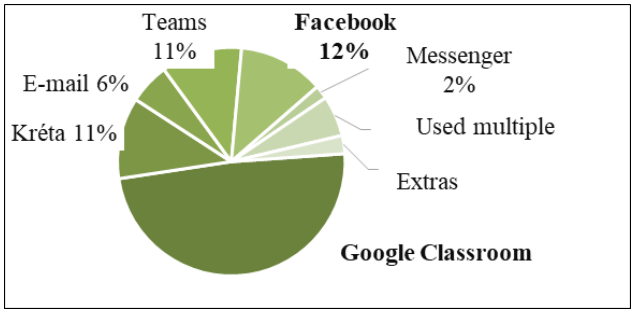

Figure 5. Form of communication during digital education.

Table 2

Lessons by live stream or recording (%)

Settlement type	*The filling teacher held live streams or recorded lessons.*	
	yes	*no*
Capital	88	12
County seat	53	47
Big-, or middle town	67	33
Small town	57	43
Villages	36	64

Our next question was about using live or recorded lessons. We were curious to see if the type of settlement could affect the response, we received in terms of the percentage indicators in the table (Table 2) teachers working in the capital had the highest number (88%) live lessons or by broadcasting recorded hours. Only 36% of educators teaching in the municipalities chose this form of digital education. An interesting observation is that the use of live lessons or recorded lessons decreases in proportion to the decrease in the size and rank of the settlement (Simonyi & Homoki, 2020).

Teachers who answered yes to the above question on a scale of 1 to 5 graded the success of live or pre-recorded lessons (1: It was not successful at all, 5: It was completely successful). Based on the results, 20% of teachers said they were fully successful, with 52% nominated grade 4 of the scale. There was no teacher who felt completely unsuccessful in holding live lessons. In pre-lessons, teachers can use some of their best practices, success also depends on the tools of the learners and on taking this form of education seriously enough. However, lack of feedback and constant contact can be a problem. Many teachers have had difficulty speaking in front of a camera, so they say there is significantly less

interaction, students ask less questions than in contact classes, so feedback is difficult to achieve.

We were looking for a link between the school type and the effectiveness of digital education, but according to the single-point variance analysis (ANOVA) there is no significant inter-group difference in the extent to how effective they felt about digital education what type of school they teach (F=1.664, =.186).

The lack of correlation may be due to the low number of sample items and the disproportionate distribution. We expected negative results in terms of efficiency in lower primary school. Due to the characteristics of the age group, students are unable to learn effectively online without parental help. In this age, instant feedback and continuous reinforcement are very important, which is not achieved in the digital environment (Lénárd, 2019), and it can reduce motivation and, proportionately, performance.

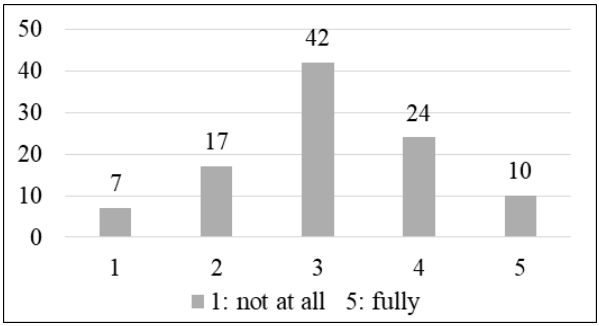

Figure 6. How prepared were the students for digital education? (%).

According to almost one half (42%) of filling teachers two thirds of pupils were not prepared for digital education (Figure 6). Categories 3-4 are the most typical (66%), but the mode is 3 and its frequency is 71. The average is 3.1. The lack of preparedness was mainly not due to the tools, but also highlighted the shortcomings of student digital competence. 10% of fillers experienced maximum preparedness. In primary school (ISCED1) pupils have little or no IT skills, in this case, the help of the parent was essential. In primary and secondary schools, the digital competence of students is already improved, but they are often limited to knowledge learned in IT classes. In many cases, during digital education the tools and applications must be managed alone by students at user level, but there are still many shortcomings e.g.: searching and filtering for information, managing information and netiquette. Based on experience, the IT subject could provide an opportunity to prepare for digital education. It would be

worth incorporating the shortcomings identified in the current situation into the curriculum.

Based on the data, the effectiveness of spring term digital education is unlikely to have approached the minimum level. "Three months of blind spots" (in most cases) characterizes the knowledge acquired by students in primary and secondary education systems in most cases. This was not revealed to other groups of the society only because of the instruction to repeat the year, but the majority of parents and educators clearly feel this in the autumn semester.

The fact how long an educator has been working as a teacher is slightly positively related to how effective he felt compared to his previous practice ($r=.176$, $p<0.05$), the same does not show a significant relationship with becoming more prepared. And those who felt effective in digital education in the spring also felt more prepared in the fall, which manifested itself as a mild positive significant link in the test ($r=.206$, $p<0.01$). Young teachers are already digital immigrants, and their digital competence is assumed to be at a higher level than that of older teachers. Yet they did not feel that education was more effective in the online space, which may be due to methodological unpreparedness.

It is very important that teachers and parents learn about the characteristics of the digital environment, especially those which are different from the usual social environment, with all the advantages and opportunities that the digital environment can offer (Lénárd, 2019).

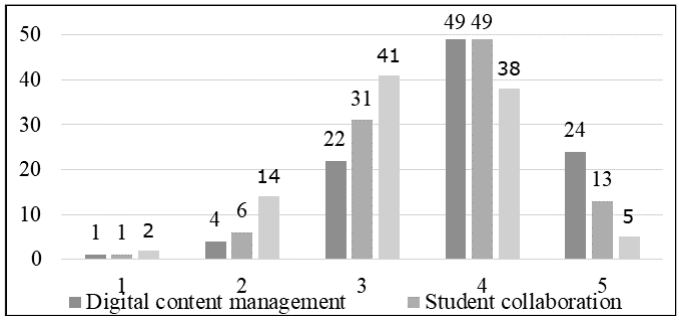

Figure 7. Characterisation of student performance (%) (1: Not at all, 5: Fully).

„A word shouted into the desert" this is the problem that characterises student performance in digital education for answers to an open question. The distribution shifts towards the right compared to the normal distribution but there is no maximum satisfaction (Figure 7). In primary school, teachers needed parental help, so the measurement of performance was not authoritative, it was

influenced by a strong parental background. In the case of upper primary and especially secondary education, problems in managing digital content hindered the effectiveness of teaching. 27% of respondents were dissatisfied with digital content management (Figure 7). The 4.5 category covers 73%, the mode is 4, and the average is 3.9. So, there have been better results in terms of content management than in terms of collaboration and meeting deadlines. Student cooperation has not been fully achieved. The frequency of value 4 is 84, mode is 4, average 3.69.

Several teachers felt that students experienced the extraordinary educational situation as a summer break, only 13% of respondents said there was a maximum level of cooperation. Meeting with deadlines was one of the crucial problems, continuous monitoring was hindered by students' ignoring deadlines. In this case, the mode is 3 and its frequency is 70. Average 3.3. Among the questions related to the characterisation of student performance, the respondents were the least satisfied with the deadline. Maximum points, only 5% marked. 55% of teachers perceived the problem which hindered their day-to-day work.

Several people have asked the question before, whether we need schools and teachers in the 21st century. In the information society, almost all information can be found via the Internet, therefore, knowledge no longer comes from the teacher, but from the information super-highway. An important consequence of the digital revolution is a change in the role of teachers and students' attitudes towards school, knowledge acquisition and learning (Kóródy et al., 2020). The COVID-19 situation has demonstrated that teachers and schools are needed because, although digital natives are assumed to have high level of digital competence, experience shows otherwise. According to Prensky (2001), people are called digital natives who have lived among advanced digital devices since birth, and managing the devices is not a problem because they grow up living up to technological advances.

Almost half of the teachers had at least one, but typically more students who could not participate in digital education (Figure 8). In disadvantaged large families, there were times when three students had one computer.

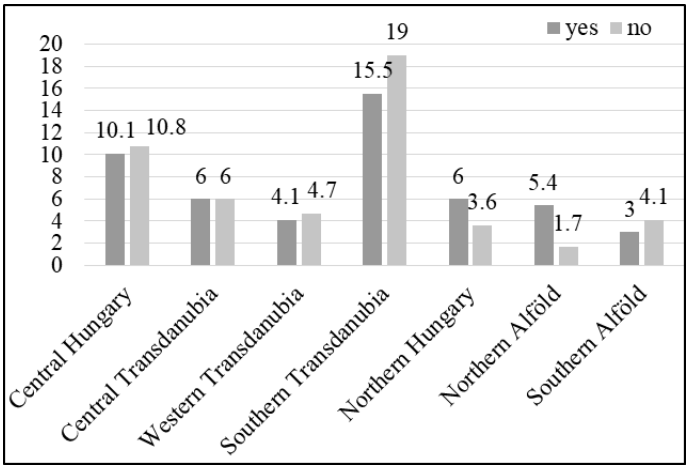

Figure 8. Students who were unable to participate in digital education (%).

According to another survey, the students were subject to technical conditions. According to parents, 86.5% of students had unlimited access to the Internet at home. If the students did not have their own device, the school gave them, for example, a laptop or desktop computer (Századvég, 2021). According to our survey, there were one or more students in each region who could not participate in digital education. Teachers have tried to manage this problem several ways. Students were contacted on paper, often by post, personal face-to-face consultations, year-end individual catching up, text messages, or telephone contact, often by mail, but this was a special burden for teachers (52%). Students who could not be reached anyhow and disappeared during digital education unfortunately failed (3%). Catching up with pupils who have not been able to participate in digital education will be a major problem in the future. According to a nationwide survey where teachers were also asked about their experiences during digital education, four-fifths of the students from Budapest participated in digital education, while only 65 percent of students were involved in the villages. According to the survey data, the higher the proportion of students with multiple disadvantages, the lower the proportion of participants in digital education. The main reason for this is the lack of adequate infrastructure, internet access or equipment. One in five teachers says children don't take part in digital education because they have a lot of adult tasks to solve e.g. supervision of a younger brother or housework (Partners Hungary, 2020).

2.2 Development of teacher digital competence

The development of teacher digital competence has been positively impacted by the closure of schools. Two-thirds of teachers (78%) felt that their digital competence had developed during that time. Their use of digital tools has become more confident, and digital toolkits have grown. Society reacted quickly to the situation. In the autumn, digital education already had more online interfaces and digital content available to teachers than before, which greatly helped teachers. And teachers have made greater use of these opportunities. There is a significant positive link between the development of teacher digital competence and the effectiveness of digital distance learning ($r=.214$, $p<0.01$). This result can be attributed to the fact that teachers, who were able to use new methods during their extra-curricular teaching work, were forced to switch to ICT tools to achieve an effective teaching-learning process. However, it was a common mistake for several educators to carry over the usual methods of contact lessons into the online space, which reduced efficiency in many cases, as new approaches and methodological solutions are needed in the digital space.

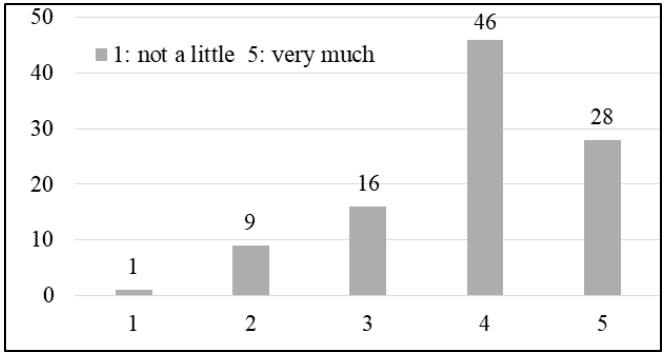

Figure 9. Level of preparedness compared to digital education in spring.

At the beginning of the 2020/20201 school year, digital education was expected to be reintroduced. Nearly two-thirds of teachers (71%) felt more prepared than in the spring (Figure 9). Categories 4-5 cover 74%, mode 4. The frequency of 4 is 78. The average is 3.9. Teacher digital competence evolved after the first digital education. Slightly for less than a third of the teachers the spring digital education period was no longer a problem, and their digital competence was probably stable. Teacher digital competence was certainly well affected by the spring transition. Due to the constraint situation, the tested competence developed mainly in an independent way. The cooperation and helpfulness of the teaching society has facilitated the development. Teachers shared their

experiences, helped each other, and prepared self-made content available to each other, thereby facilitating development.

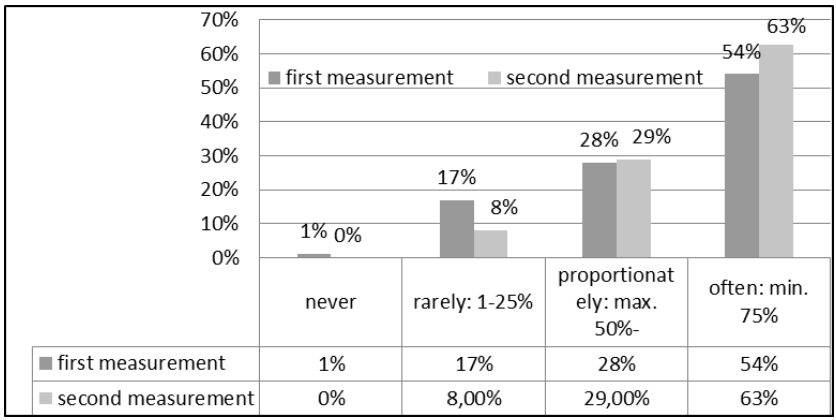

Figure 10. Rate of use of ICT tools and digital content in lessons.

Most of the teachers responded to the new situation in a way that was appropriate of their vocation. In a previous questionnaire study, only 54% of filling teachers used ICT tools, because of the switch to digital education, 63% of digital content was introduced into education during the second measurement on a minimum of 75% (Figure 10). These proportions are partly due to the necessity of the situation. However, there are teachers who are much more confident using ICT, many teachers have come to know new content, created self-edited digital content and task sheets, which they will use in normal contact lessons in the future. Progress is numerical; however, it should be mentioned how mentally and physically this situation has exhausted both teachers and students. Educational work was limited only to education, thus wasting valuable time from the students' point of view, which could have been spent on students' personal development.

3 Discussion

In the case of issues related to the teaching activities of digital education, it can be said that a significant number of teachers had difficulties in the course of digital education in the spring and in fact digital education was not implemented. The methods remained the same, they just moved to online space (Figure 11). Those who held live classes were usually dominated by verbal communication, but a significant proportion of teachers did not even take it. In this case, he only

published the page number of the textbook, the assignments he had to send to the students. In many cases, students did not meet with the teacher for 3 months. The interface was the Google Classroom they used. It was not possible to make live videos here at the time.

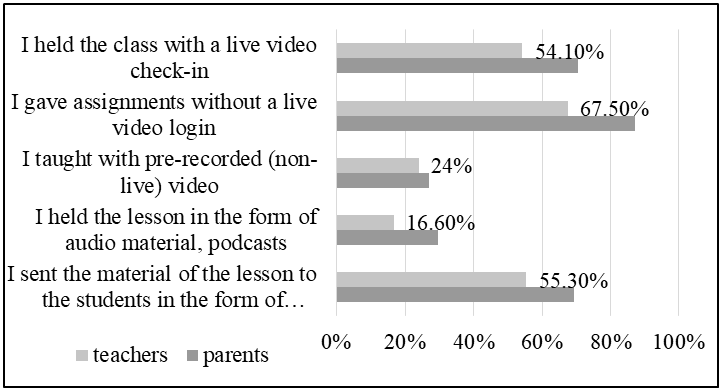

Figure 11. How to keep lessons (several possiblen answers) (Századvég, 2021).

65% of respondents were more dissatisfied with student performance. Although it should be stated here that their research covered both semesters and that the autumn period was already better than the spring period. Dropouts and deficiencies are quite significant, especially among those living on the periphery. However, through school leadership, public education leaders have restricted the publicity of real data on backlogs. In our own teaching experience, a significant number of students joined in, but in many cases at the other end of the line we did not know what they were doing because they did not connect a camera. The illegal use of resources was also discovered several times during the audits and reports. Despite all these biases, a significant number of educators focused not only on the curriculum, but also on the mental state of the children, so they also devoted more time to conversations once they had taken on online lessons.

Conclusion

Institutions and educators who used different digital platforms and ICT tools before the 'virus' have taken advantage of those who only later began to deal with digital competence and the possibilities of digital education under duress. Teachers who lacked digital literacy, based on our questionnaire study, tried to catch up behind others by striving to catch up, thus avoiding falling behind in the digital world. Teacher digital competence has developed measurably over the

period under review. In the second round of digital education, which has since been reintroduced, a further rapidly positive change in this competence can be assumed.

During the second wave, the world was a little more prepared for the fact of the new closure, including Hungary. Teachers prepared in spirit for the possibility of hybrid education, which occurred several times in the 2020/21 school year even in classes 1 - 4. Based on the measurement carried out in the autumn semester, the proportion of teachers providing online lessons above 50% increased by 10%, and the repertoire of applied surfaces and software has also been expanded. This result was confirmed by the contact tests. And that those who felt digital education was more effective were teachers who were more self-friendly users and felt a stronger development in their abilities. The pandemic highlighted the truth of what Mátyás Turós said about the operation of Waldorf schools and IT: "a more and more crucial task for human beings is to embed technology into the world through the intellect" (Turós, 2022, p. 106).

During that time, teachers and parents faced a new problem which we believe is a common task to solve. Students were in front of the computer all day, which may involve dangers. Excessive internet use and the online world can alienate children from real social connections. It may become a primary social factor among learners (Amichai, 2003). Negative opinions online can have a devastating effect on the emerging self-image of young people in public education (Valkenburg et al., 2006). The emerging self-image of young people in public education can be affected by negative reviews online (Valkenburg et al., 2006). The threat factor is growing in digital education, by often allowing students into the online school schedule without external supervision.

According to another research, looking at the specificities of the teaching and learning process in the digital work schedule, it is important to mention that teachers spent much more time preparing for their lessons in proportion. While previously 6-10 hours were spent preparing weekly (33% of the fillers), during the digital work schedule, up to 26 hours or more time spent preparing (21%) (Századvég, 2021). This fact confirms that there is room for improvement in the field of digital competence.

Regional differences in pupil performance could hardly have been established due to the territorial distribution of the sample, but it decreased based on the teacher's experience, in which in many cases the lack of equipment or motivation played a role. However, from the interviews started as a continuation of the research, the picture can be seen, which was reflected in Table 2, that the territorial hierarchy has a very much influence on the performance and participation rate of students in digital education. This problem needs to be addressed as soon as possible, as the intensification of segregation in the digital education space will only happen after years, and then we will not be able to

remedy it. According to some estimates, a third of disadvantaged pupils were unable to participate in digital education (Kende et al., 2021). In Budapest, the proportion of students involved in digital teaching is 80%, while in the villages it is 65%. According to the data, the higher the proportion of students with multiple disadvantages, the lower the proportion of people in digital education. In relation to the causes of the outage, most people mentioned the lack of adequate infrastructure, computers and internet connections. In many cases, contact teaching was provided in these segregated schools during quarantine to reduce backlog.

The other problem to be solved is the transformation of teacher training and further training, where teachers and teacher candidates must now be specifically prepared to stand up in a similar educational environment, to comment on mental problems, to deal with them. In this respect, several foreign research results can be used (Medzini et al., 2014; Ávila et al., 2020), examples of digital opportunities within the framework of geography on certain topics, in our case. However, we must add that the standard of living of the majority of Hungarian society is an obstacle in their application, as in many cases students' tools are not suitable for the use of these innovations and conditions.

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EFL Instructors' Perceptions of Utilizing Mobile-Assisted Language Learning in Higher Education

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Abstract:

Introduction: One of the prominent approaches in language education is Mobile-Assisted Language Learning (MALL) due to recent advances in technology. To benefit from MALL effectively and develop it when it is required, it is important to know the perceptions of the ones who use it. Although much research related to students' and teachers' perceptions of MALL in primary and secondary education is present in the literature, research related to perceptions of instructors in higher education is limited. Thus, this study aimed at identifying the instructors' perceptions of utilizing MALL in higher education.

Methods: As the perceptions of the participants were aimed to be explored in detail, the qualitative research design was adopted. An open-ended questionnaire was developed by the researchers and administered to 24 instructors working at the English Language Teaching (ELT) departments of different universities in Turkey. The data were analyzed through content analysis.

Results: It was found that the instructors defined MALL as using mobile technologies for language learning. Moreover, the participants had positive perceptions about MALL as it had some benefits, such as anytime, anywhere learning, stronger students' interest, higher motivation and autonomy, individualized and collaborative learning. However, MALL users faced some challenges, such as weak internet connection and battery, time consumption in terms of preparing content for the class, classroom management problems and low digital literacy of both students and instructors.

Discussion: The results of the study were parallel to the findings of the previous studies in the literature. This study found that MALL contributed to learning independent of time and place, high motivation and interest, saving time and energy, individualized learning, collaborative learning, autonomous learning, and learning with fun.

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Limitations: This study is not without limitations. Triangulation of data with in-depth interviews could be implemented to increase detailed information and reliability.
Conclusions: The results of the study showed that instructors who had benefitted from technology in their teaching process had positive perceptions despite some challenges. To this end, it is suggested that MALL be utilized in language teaching by minimizing its challenges.

Key words: mobile-assisted language learning, EFL instructors, higher education, perception

Introduction

Educational approaches and applications are affected by what is going on in the world. One of the latest examples of this is the COVID-19 pandemic which has affected all societies in all fields including education. Due to a long recess in schools, education has to be realized in online environments. Thus, the importance of integrating technology into education has been understood more than ever. Being one of the approaches that unify technology and pedagogy, mobile learning has become more of an issue as it provides learning "anytime and anywhere" (Kukulska-Hulme & Shield, 2008) which seems to be what we need nowadays.

Apart from the "rescuer" end of mobile learning (m-learning) during the pandemic, its characteristics make it necessary to consider using it in language learning classes. As m-learning "exploits the spontaneous and opportunistic nature of learning on the move" (Kukulska-Hulme & Traxler, 2005, p. 31), it may make learning a language easier. Mobile learning takes the name of Mobile-Assisted Language Learning (MALL) when it is adapted to language education. MALL can be seen as a shift from Computer-Assisted Language Learning (CALL). Emerging in 1983 (Chapelle, 2001), the term CALL was defined as "the search for and study of applications of the computer in language teaching and learning" (Levy, 1997, p. 1). It is a process where learners improve their foreign language by using a computer (Beatty, 2003). Although it has affected language learning and teaching profoundly, it has undergone an important change due to portable devices that have removed the limitations of sitting in front of a computer in a determined time and environment. Innovations in technology and pedagogy got the behaviorist structure of the first CALL and gave place to integrative CALL (Warschauer & Healey, 1998). Siemens (2005) stated that people's way of working and functioning changed when new devices were employed. Thus, new concepts such as Technology Enhanced Language

Learning (TELL) (Bush & Terry, 1997) and Mobile-Assisted Language Learning have emerged. MALL differs from CALL "in its use of personal, portable devices that enable new ways of learning, emphasizing continuity or spontaneity of access across different contexts of use" (Kukulska-Hulme & Shields, 2008, p. 273) but it "mirrors m-learning as they both focus on contextualized learning, flexibility and active community participation of the learner" (Çakmak, 2019, p. 37).

MALL is defined as "any sort of learning that happens when the learner is not fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies" (O'Malley et al., 2005, p. 6). It is using mobile devices such as smart-phones in the language learning process in which portability and situated learning are advantageous (Kukulska-Hulme, 2018). It provides learning a language without the limitations of place and time; in other words, anytime and anywhere. The term "assisted language learning" in MALL was criticized by Jarvis and Achilleos (2013) as conscious learning was insufficient to describe it and the term of Mobile-Assisted Language Use abbreviated as MALU was suggested. MALU is "non-native speakers [sic] using of a variety of mobile devices in order to access and/or communicate information on an anywhere/anytime basis and for a range of social and/or academic purposes" (p. 9). Although unconscious learning in MALL is a good point to be addressed, the learning process has many other dimensions except for technology. Thus, technology still assists language learning no matter how much it is penetrating into our educational lives day by day.

The related literature indicates that MALL can be utilized in foreign language learning for various aims such as developing linguistic skills of learners. Some research shows that it is effective to improve vocabulary (Ağca & Özdemir, 2013; Başoğlu & Akdemir, 2010; Chen & Chung, 2008; Çavuş & İbrahim, 2009; Lu, 2008; Okumuş Dağdeler, 2018; Stockwell, 2007, 2010; Zhang, Song, & Burston, 2011), speaking (Ataeifar, Sadighi, Bagheri, Behjat, & Wang, 2019; Hadi & Emzir, 2016; Tonekaboni, 2019), reading (Chang & Hsu, 2011), listening (Gaber, 2015; Huang & Sun, 2010; Hwang & Chen, 2013), writing (John & Yunus, 2019; Li & Hegelheimer, 2013), grammar (Baleghizadeh & Oladrostam, 2010; Khodabandeh, Alian, & Soleimani, 2017; Rozina, Shima, Rahmah, & Hafiza, 2017) and pronunciation (Arashnia & Shahrokhi, 2016; Ardi, 2017; Saran, Seferoğlu, & Çağıltay, 2009). Moreover, it is important in terms of some affective behaviors such as learner autonomy (Gaber, 2015; Leis, Cooke, & Tohei, 2015; Lyddon, 2016), motivation (Lawrence, 2015; Sandberg, Maris, & de Geus, 2011), self-efficacy (Yorgancı, 2017), and readiness (Mahat, Ayub, & Luan, 2018; Shuib, Azizan, & Ganapathy, 2018). These studies addressing one of the dimensions of language learning indicate the possible contributions of

MALL to language education. It is also essential to know how the users such as students and teachers perceive MALL. Thus, some research has been done to see teachers' and students' beliefs about MALL in primary and secondary education (e.g., Azli, Shah, & Mohamad, 2018; John & Yunus, 2019; Steel, 2012). However, higher education is still needed to be investigated.

1 Literature review

The studies carried out in higher education are generally oriented to the students. The number of studies about instructors' perceptions of MALL in higher education is limited. Findings of research on both the students' and instructors' perceptions of MALL were presented below (e.g. Hişmanoğlu, Ersan, & Çolak, 2017; Saidouni & Bahloul, 2016).

The review of the literature shows that English as a Foreign Language (EFL)/English as a Second Language (ESL) learners' attitudes towards MALL are mainly positive. They believe that MALL is a valuable asset for language learning (Jimenez, 2019). MALL is favorable among EFL learners as it provides learning anytime and anywhere. EFL learners are glad to be able to discuss online whenever and wherever they want (Yang, 2012) and benefit from their smartphones and iPads before, during and after classes for different activities (Kwangsawad, 2019). Students feel comfortable learning through mobiles both inside and outside the classroom (Ali et al., 2010). Both the technical features of mobile devices and mobile applications related to language learning provide personalized and individual learning. Mobile devices are designed technically for individual use. On the other hand, mobile applications providing socializing, such as WhatsApp, and many language applications enhance collaborative learning. This feature of MALL is appreciated by EFL learners. They explain that MALL promotes working individually and also collaboratively (Yang, 2012; Yudhiantara & Nasir, 2017). MALL is found beneficial also in terms of motivation, language awareness, immediate feedback, autonomy, access to various materials (Deng & Shao, 2011; Klimova & Polakova; 2020; Nino, 2015; Okumuş Dağdeler, 2018; Perez-Paradez et al., 2019; Soleimani et al., 2014). Moreover, EFL learners develop good attitudes towards MALL as they believe that it develops their speaking, listening, reading skills, phonological knowledge and information about the culture of target language Aatefari et al., 2019; Saidouni & Bahloul, 2016; Yudhiantara & Nasir, 2017). On the other hand, Hsu (2013) has found that learners think that not all linguistic skills can be developed only through mobile devices. Similarly, the study of Nami (2020) has concluded that all language skills cannot be practiced equally via mobile applications.

On the contrary to these positive attitudes, the participants in the study of Fujimoto (2012) have expressed negative feelings about using mobile devices for educational purposes due to screen size, cost of mobile devices and limited

functions of mobile devices. Like many other technological devices, mobile devices have also some weaknesses and MALL also has its limitations. The weaknesses of mobile devices that EFL learners utter mostly are a low duration of the mobile battery, the problem of storing big data and small screen size (Al-Said, 2015; Aygül, 2019). Jimenez (2019) argues that learners' preferences for mobile devices should be taken into consideration; not every mobile device should be used. Moreover, some pedagogical concerns such as distraction make learners uncertain about the usage of MALL. The participants of Kwangsawad (2019) study note that there should be strict rules so that students cannot misuse mobile devices.

The research shows that pre-service English teachers, who will be the practitioners of language teaching process, know what the term MALL means. Nariyati et al., 2020). Pre-service teachers regard MALL as learning "anywhere and anytime" which is the definition of Kukulska-Hulme and Shield (2008), who are one of the scholars that have contributed much to the conceptualization of mobile learning. MALL removes the limitation of time and place according to the pre-service teachers (Öz, 2014) and it provides ubiquitous learning (Pourabad, 2016). On the other hand, pre-service teachers are sceptical due to some challenges of using MALL, such as lack of mobile devices, internet connection and low digital literacy (Öz, 2014; Pourabad, 2016). Some pre-service teachers consider mobile phones as a dangerous factor leading to addiction while most of the participants explain positive opinions regarding mobile phones as useful and entertaining devices which are parts of daily life (Şenel, 2016). Mobile devices provide authentic, ubiquitous, easy and enjoyable language learning according to 142 pre-service English teachers (Aygül, 2019). Similarly, in-service English teachers have positive perceptions of MALL thanks to its benefits, such as facilitation of learning, portability, time-efficiency, and ubiquitous learning (Dashtestani, 2013). Interestingly, teachers do not utilize mobile devices in their courses although they have good attitudes towards them. Hişmanoğlu et al. (2017), who have sought the opinions of instructors working in universities' preparatory programs on MALL, have found that instructors believe that MALL develops communicative skills, but they are uncertain in using it in EFL teaching. This doubt can generate from some limitations of MALL, such as the difficulty of controlling students, lack of knowledge about technology use and distraction of learners' attention.

The previous research shows that there is still a need for understanding the practitioners of MALL in higher education. It is observed that there are some studies investigating students' perceptions of MALL; however, studies focusing on instructors' perceptions are rare. Thus, this study aimed at identifying ELT instructors' perceptions of the utilization of MALL in higher education. The

research question of the study is as follows: How do EFL/ESL instructors perceive utilizing MALL in higher education?

2 Methodology

This study adopted a qualitative research approach. The qualitative approach aims to interpret how humans who are the actors of the world perceive the world (Glesne, 2012). The focus of this study was to identify the perceptions of instructors.

2.1 Study group

The study group of this research consisted of 24 instructors working at different universities in Turkey. These instructors work in the department of English Language Teaching. The demographic information about the study group was given in the table below.

Table 1

Demographic information of study group

		f
Gender	Female	13
	Male	11
Age	29-32	10
	34-50	9
	51-65	5
Title	Prof.	4
	Assoc.	4
	Assist Prof. Dr.	8
	Lecturer	6
	Research Assistant	1
	Other	1
Teaching years	1-5	4
	6-10	8
	11-15	3
	16+	9

The table shows that most of the participants were female (f=13) and young mostly at the ages of between 29 and 32 (f=10), and 34 and 50 (f=9). There were five participants whose ages ranged between 51 and 65. As the academic title of the study group was examined, it was seen that there was diversity. Professors (f=4), associate professors (f=4), assistant professors (f=8), lecturers (f=6) and research assistant (f=1) were included in the study group. The teaching experience of the study group was high as nine participants were teaching

English for more than 16, 8 participants for 6-10 years, 4 participants for 1-5 years and 3 participants for 11-15 years.
The study group was asked whether they used technology in their classes and it was seen that all of the participants used it as can be seen in Figure 1.

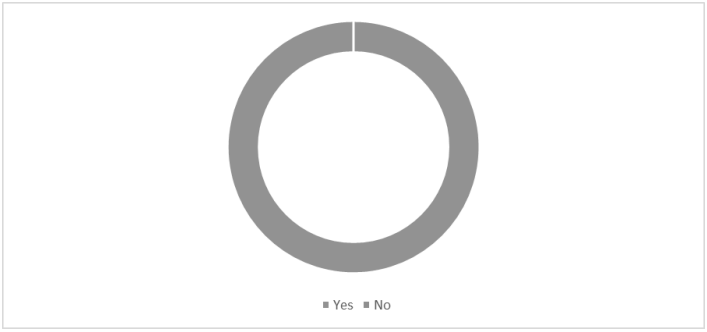

Figure 1. Do you benefit from technology when teaching English?

The types of technological devices that the instructors used in their classes were asked and the answers were presented in Figure 2.

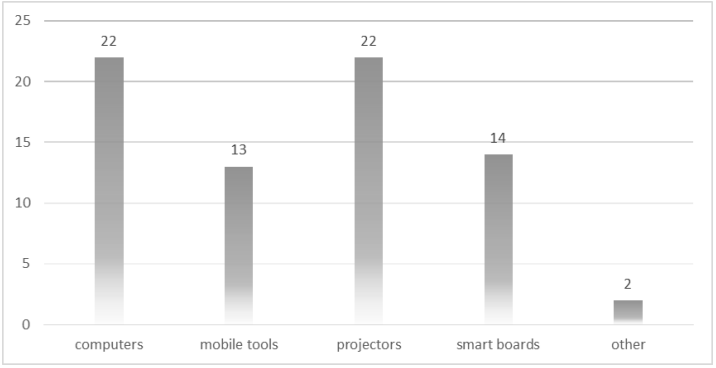

Figure 2. Technological devices.

Figure 2 shows that most of the participants used computers (f=22) and projectors (f=22) when teaching English. The number of those using mobile tools (f=13) and smart boards (f=14) was more than half of the participants.
The instructors' preference for instructional technology materials for language educations was as follows:

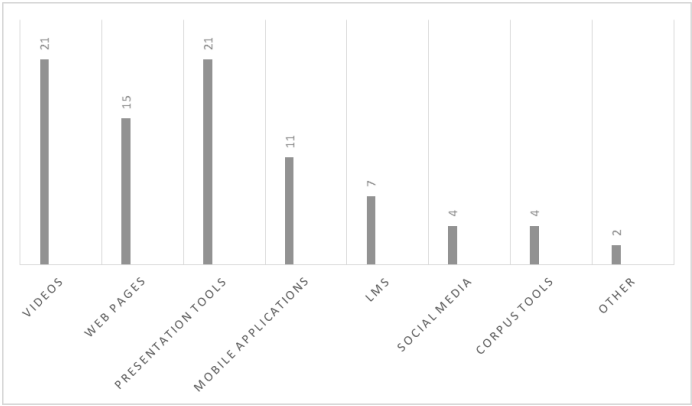

Figure 3. Instructional technology materials.

Figure 3 indicates that nearly all of the participants used videos (21) and presentation tools (21) such as PowerPoint and Prezi for language education. Most of the participants benefitted from different online sites (15) while some of them preferred mobile applications (f=11), Learning Management systems (LMS) (7), social media (4) and corpus tools (f=4).

2.2 Data collection tools

An open-ended questionnaire was prepared by the researchers. This questionnaire was sent to 2 experts of both English language and methodology of scientific research to get expert opinions. Then, the questionnaire was sent to 2 academics working at English language teaching departments for piloting. Both expert opinions and pilot participants showed that not many revisions were required on the questionnaire except for some grammatical mistakes. Thus, the questionnaire was sent to 71 instructors working at different universities in an online platform. By keeping in mind that the response rate could be low in online surveys, the questionnaire was sent to 71 academics although it was a high number for a qualitative research study. 24 instructors responded to the online survey and all of them were included in the data analysis.

2.3 Data analysis

To analyze data, content analysis in which a coding system was developed was used. A coding system involves searching through the data for finding regularities, patterns and topics and then writing down words and phrases to represent these patterns and topics (Bogdan & Biklen, 2007). The data were coded by the researchers. The frequency of codes was found and presented as

using numerical data in qualitative research to make some contributions to research such as helping researcher a) determine the diversity in the perceptions or beliefs of participants, b) provide evidence for his/her claims and interpretations c) make internal generalizability of researchers' claims (not of conclusions like in the quantitative research) and d) identify patterns which are not obvious in qualitative data that are not unquantified (Maxwell, 2010).

3 Results

The study group was asked what MALL meant to them and the answers were categorized as follows:

Table 2

Meaning of MALL

The meaning of MALL	*f*
Using mobile technology for language learning	13
Easiness while teaching	2
Motivation and usefulness	2
An opportunity to embed learning into the worlds of new generations	2
Innovation	2
A part of modern language learning	1
Using less stressful more practical data & input access for learning	1
A must in the courses for keeping up the technology	1
Learning in a fun way	1
Integrating real-life content into teaching	1

The table shows that most of the lecturers believed that MALL was integrating mobile technology in language learning. For example, Participant 7 defined MALL as follows:

"It can be broadly defined as using mobile devices when learning the target language."

The participants thought that MALL could be benefited in classes or outside classes. Some of the lecturers stated that it could be used both in and outside the class. The excerpts from some participants were as follows:

"MALL is integrating mobile phones into language learning both in and out of the classroom." (Participant 3)

"The students can use their mobile phones in and out of the classroom with the aim of learning." (Participant 4)

According to two lecturers, MALL was easy while teaching and it was motivating and useful. Again, two lecturers believed that MALL addressed the

new generation while teaching. Other perceptions related to the MALL were that it linked real life and teaching, and that it was a must in language learning and a part of modern language learning.

Although most of the lecturers used a general term like mobile tools, technology and devices *some* participants specified the type of mobile technology like mobile phones (f=4) and mobile applications (f=2). As analyzing the definitions of MALL for the participants, it was found that MALL was using mobile technology in language learning for the following aims:

Table 3

Aim of using MALL

Aims of using MALL	*f*
To enhance active learning	1
To share course-related materials	1
To give feedback before class time	1
To make the lesson more digital native friendly	1
To address the learners with diverse learning styles	1
To develop language skills	1
To save time	1

Table 3 shows that the participants utilized MALL with the aims of saving time, helping learners develop linguistic skills, promoting active learning, addressing learners with different types of learning styles, giving feedback, sharing materials with the learners, making the lessons digital native friendly.

It was asked what the benefits of integrating MALL into the classrooms were. Table 4 shows the thoughts of participants.

Table 4

Benefits of MALL

Benefits	*f*
Gets students interests to learning	7
Motivates the students	6
Provides autonomous learning	5
Provides reaching various resources and knowledge instantly for students	5
Makes giving feedback easier	3
Facilitates learning	3
Makes teaching and learning easier	3
Provides anywhere anytime learning	3
Provides learning in a fun way	3
Saves time and energy	3
Makes learner interact with course materials	1

Addresses different types of learners	1
Provides authentic language learning	1
Provides individualized learning	1
Provides collaborative learning	1

The results of the open-ended questionnaire indicated that there were many contributions of MALL according to the participants. The most addressed contribution was the attention-drawing dimension of MALL (f=7). The participants explained that using mobile devices got the interest of the students to the course. Some example excerpts were as follows:

"It helps draw students' attention and get rid of the boredom of traditional textbooks." (Participant 2)

"We can benefit from digital native students' interest in technology and turn [sic] into a learning tool." (Participant 5)

The other benefits of MALL that were addressed mostly by the participants were that it provided autonomous learning and motivated students. According to the participants, MALL…

"gives the students the opportunity to take the responsibility of their own learning." (Participant 12)

"is motivating both the teacher and students." (Participant 23)

The participants also believed that MALL provides *"anytime, anywhere learning"*, which can be seen as a de facto definition in the related literature (Kukulska-Hulme & Shield, 2008). This ubiquity may lead to another benefit that participants explained. MALL helped the students to have fast access to the knowledge and various materials. Some statements of the participants were as follows:

"…For students, it helps to reach knowledge fast, follow their interest, receive instant feedback about their performance and increase their autonomous language learning." (Participant 20)

According to the participants, MALL saved time and energy and makes learning process easier for the teachers. As for the students, learning was funnier through MALL. While one participant believed that MALL provided individualized learning (Participant 21), for another participant (Participant 20), it was a collaborative way of learning.

Although there were many benefits of MALL, there were also some challenges of it as to the participants. Table 5 shows the challenges of using MALL for language learning and teaching.

Table 5

Challenges of MALL

Challenges	*f*
Internet connection problems	7
Preparing for the class (e.g. Finding the right application) is time-consuming	6
Limited technological skills of students and teachers	5
Learners might be distracted	5
Lack of appropriate mobile devices	4
Lack of appropriate applications and activities	2
The difficulty of controlling the learners	2
Electricity outage	1
Not user-friendly applications	1
Battery problems of mobile phones	1
Not suitable for activities requiring high order skills	1

Table 5 shows that there were some technical problems and some problems related to students and teachers. The technical problems included internet connection problems, lack of appropriate applications, electricity outage, not user-friendly applications, and battery problems. The problems originating from students included difficulty in controlling them, their possibility of distraction and limited technological skills. The other challenges that the instructors uttered were that preparing for the class was time-consuming, limited technological skills of teachers, lack of mobile devices and the inconvenience for activities requiring high order skills. Some examples were as follows:

"I am also interested in MALL and use some MALL-oriented activities, but the common problem is the internet connection and it is not very suitable for activities that require higher-order thinking skills. For example, I am taking this survey on my phone and typing is a bit difficult on the phone." (Participant 18)

"Most of the activities related to the [sic] MALL in the class are based on smart-phones, and they generally require an internet connection. Then, poor internet connection can be a major problem during an activity. If teaching activity [sic] is not well designed and engaging for students, the students can be easily distracted and might prefer to spend time surfing on the net or chatting on social media instead of studying English. Also, some students might have limited technologic [sic] skills and have cell phones not supporting the activity or application because of the mobile operating system. These issues can hinder the effective use of the [sic] MALL in the class." (Participant 21)

4 Discussion

Both students' and teachers' perceptions on using mobile technologies in language learning are important as it may help its improvements of implementations. However, the number of studies focusing on EFL instructors' perceptions of MALL in higher education is limited. Thus, this study tried to fill this gap and set to work by firstly asking how the instructors defined MALL. The answers showed that the instructors defined MALL as using mobile technology for language learning. This definition is parallel with the earlier definitions of mobile learning. M-learning was defined as any kind of learning happening through a mobile tool (Trifonova, 2003). Then, it was reformed as "learning mediated via handheld devices potentially available anytime, anywhere" (Kukulska-Hulme & Shield, 2008, p. 273). Although the participants of this study did not refer to this "anytime anywhere" feature of MALL in their definitions, they mentioned it while addressing the benefits of MALL. A few participants emphasized that MALL was learning outside and inside the classroom.

Some distinctive features of mobile learning, such as mobility of technology, learner, and learning (Kim & Kwon, 2012) ensure some distinctive benefits in terms of language learning. This study found that these benefits were that MALL contributed to learning independent of time and place, high motivation and interest, saving time and energy, individualized learning, collaborative learning, autonomous learning, and learning with fun. This finding was in line with the other perception studies in the literature. The literature showed that MALL was useful in terms of time-efficiency and ubiquitous learning (Dashtestani, 2013); individual and collaborative learning (Yang, 2012; Yudhiantara & Nasir, 2017), easy access to various educational materials (Soleimani et al., 2014), and motivation and autonomy (Perez-Paradez et al., 2019).

These distinctive features of MALL imply not only benefits but also some challenges. Some challenges that the participants of this study addressed were internet connection problem, low digital literacy of teachers and students, lack of mobile devices and applications, distraction, and difficulty of classroom management. This finding supported the findings of Hişmanoğlu et al., (2017), who explored teachers' perceptions of MALL in higher education. It was found that the main challenges of using mobile phones in language learning were lack of knowledge about technology, distraction and difficulty of managing learners.

While discussing these findings, it was kept in mind that 13 of 24 participants used mobile tools in their teaching process. When the responses of participants were examined one by one, it was seen that all participants thought that there were both benefits and challenges of MALL. Thus, it was not observed a significant difference between the ones who used mobile tools and who did not in terms of positive or negative perceptions of MALL.

Conclusion

This study investigated the beliefs of instructors about the utilization of MALL in higher education. The results showed that instructors who had benefitted from technology in their teaching process had positive perceptions despite some challenges. Thus, it is suggested that MALL be utilized in language teaching by minimizing its challenges. To minimize those challenges a) some rules can be set to decrease the misuse of mobile devices (Kwangsawad, 2019), b) students' and teachers' awareness of MALL and its efficiency can be raised (Saidouni & Bahloul, 2016), and c) both teachers and students can be trained about technology use.

It is hoped that this study will contribute to the literature by examining the perceptions of practitioners who are educating future English teachers. This is important as pre-service teachers should "prepare themselves to teach in the digital era" (Nariyati et al., 2020, p. 44). Thus, it is required to see what the educators of pre-service teachers think about teaching with technology. Despite the contributions, this study is not without limitations. Triangulation of data collection tools with in-depth interviews could be provided to increase detailed information and reliability, which is suggested for further research.

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English as a Foreign Language Teachers' Techno-Cultural Awareness Levels and Self-Reported Competencies

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Abstract:

Introduction: In line with technological developments, many educational institutions offer students and teachers technical opportunities to benefit both inside and outside the schools. From the perspective of utilizing technology for a more effective language learning and teaching process, the present study aims to reveal techno-cultural awareness levels and self-reported competencies of secondary school English as a Foreign Language (EFL) teachers working in Turkey.

Methods: A total of 36 secondary school teachers participated in the study, and data were collected through a questionnaire and focus group interview. The focus group interview was conducted after the quantitative data analysis so that the quantitative data results guided the focus group interviews.

Results: The study's findings show that participants have positive attitudes towards using technology in EFL classes However, most participants still feel they are not competent enough to utilize it for instructional purposes. In this context, all participants agree that the education they received during pre-service and in-service training offered by the Ministry of National Education (MoNE) is insufficient.

Discussion: The results obtained from data analysis are in parallel with some other studies. According to the findings, pre-service teacher training programmes need to be developed in line with the needs and expectations of teachers and learners regarding the use of technology in language teaching. Furthermore, it is suggested that teachers should be supported with much more comprehensive in-service training programmes to keep them up-to-date. In this regard, professional development programmes based explicitly on improving teachers' technological awareness would motivate them to teach and significantly impact their self-reported capabilities.

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Limitations: This study was limited to 36 participants working in secondary schools in the same province. Therefore, the results cannot be generalized to all language teachers. Furthermore, the data collection process was carried out using questionnaires and focus group interviews.
Conclusions: What makes this study significant is that teachers are central to the research. From this point forth, the current study results reveal the analysis of the data obtained from a small province of Turkey. However, the study shows significant and representative results because the teachers included in the study are individuals with the same educational levels. They have graduated from different universities in Turkey, and their working environments somewhat reflect Turkey's working environments. Considering the differences between teachers' positive attitudes towards technology utilization in EFL classes and their capabilities, it is argued that in-service and pre-service training programmes should be reviewed to overcome these deficiencies and keep up with the new developments.

Key words: EFL teaching, technology, techno-cultural awareness, teacher training.

Introduction

New technologies that emerged in the second half of the twentieth century have reached the power to change social and economic conditions worldwide. In many parts of our daily life, we live with or without awareness of these technologies. In recent years, one of the technological products that have attracted intense interest is computers. The word computer has come to be heard and used dramatically in our daily lives. Additionally, various mobile devices that offer similar opportunities have also become indisputable tools of our daily lives recently. In other words, technology is becoming a natural part of our lives, and students of all ages are also involved in such a bundle of technology including educational settings. In this context, technology could be considered as an instrument for learning and developing learners' competence.

Moreover, when considering individuals' awareness and competence levels, the term 'techno-culture' has come into prominence in many studies. Techno-culture is the cultural climate built around today's science which is inseparably articulated with technology and turned into a techno-science. The technical reason behind society's goal to be predictable, computable, and controllable is to transform culture quickly to realize its ideology. The material conditions of this transformation are largely formed by the articulation of technology with science.

In addition to the ideas about the perspiration of technology in education, teachers' attitudes towards using their technological facilities and their self-

efficacy beliefs on this issue are of great importance. In this context, whatever the level of technology with which classrooms are equipped or the materials are developed is, the amount at which it could be utilized in formal education is determined by both attitudes and efficacies of the teachers. Needless to say, Turkey has taken considerable steps regarding the integration of technology in nearly every aspect of national education. As part of the FATİH (Movement for Increasing Opportunities and Improving Technology) Project initiated by the Ministry of National Education (MoNE), smart boards were installed in almost all public schools across the country, and tablets were distributed to students. Although the intended efficiency of the distributed tablets is not fully achieved, smart boards are very effective in almost every course, including English. It is obvious that for the new generation born into the age of technology and defined as digital native or generation Z (Csobanka, 2016), if such technological supports are used appropriately and effectively, they can fuel learning. Considering a large number of EFL teachers with various socio-cultural and educational backgrounds enrolled in the national education system, there are still some doubts and worries about whether every or at least a significant number of teachers are acting in parallel with national education policies in this regard.

1 Review of literature

Foreign language teaching has been a matter of problem for many countries' national education policies. The amount of the problem could heavily depend on the countries' familiarity with the target language regarding their socio-cultural and educational background. To Kachru (1985), the current status of English in the world can be categorized in three circles: inner circle, outer circle, and expanding circle. In the inner circle, English is spoken as a mother tongue in countries such as America, England, and Australia whereas it is spoken as a second language in countries such as India, the Republic of South Africa, Pakistan, and Kenya in the outer circle. In other words, in most of these countries, English is used either as an official language or a second language. On the other hand, in the countries located in the expanding circle such as Turkey, Russia, China, and Japan, English is learned and used as a foreign language. The countries included in the expanding circle are expected to make the greatest effort with various facilities to fuel their foreign language teaching policies and processes because of various limitations. In this sense, Cziko (2005) claims that there are a couple of limitations that negatively influence EFL classrooms. Limited amount of exposure to the target language, limited opportunities that could enable learners to use the target language, possible exposure to forms or expressions produced inaccurately by both peers and teachers, the lack of authentic communication production, and EFL teachers' possible unsatisfying language ability and cultural knowledge are the major limitations to list a few. In

order to overcome these limitations, integration of technology into EFL teaching can be claimed to be one of the most important issues that needs to be taken into account by course designers and policy makers in education.

With the rapid technological advancements in the 21st century, language teaching programmes have also had to review and revise their positions. Integrating the activities based on Technology-Enhanced Language Learning (TELL), Computer-Assisted Language Learning (CALL), and Mobile-Assisted Language Learning (MALL) has inevetably sharpened learning and teaching ecosystems. Thousands of useful software, e-books, web pages, and smartphone applications that we can use are also at the service of those who want to learn English. The concept of CALL was first introduced in the United States in the 1960s, and studies began in the US in the 1970s. While CALL was initially a costly undertaking, cost pressures disappeared as a result of the spreading of personal computers and the decline in prices. That is to say, with the widespread use of multi-media and internet opportunities, it has been emphasized that CALL has made significant contributions to the language learning process (Avent, 1994; Aytürk, 1999; Cardoso, 2018; Çakır, 2016; Fox, 1991; Kennedy, 1989; Kurt, 2002; Tuzcuoğlu, 2000; Uzunboylu, 1995).

It is safe to say that encouraging students to use language both inside and outside of the classroom with the help of technology has an undeniable effect on developing learners' attitudes and motivation towards language learning. To do this, it is important for learners and teachers to be familiarized with regarding technologies, and technology-integrated conceptions of language knowledge and skills need to be updated to include the technology-mediated contexts in which language learners communicate and learn. Simply put, as in other disciplines, utilizing technology has an indisputable role in education. Especially, as the requirement for technology use in language teaching is relatively higher in comparison to other fields (Kartal, 2005), the use of contemporary technological facilities for language learning and teaching comes into prominence.

The significant link between language and culture and the mediating influence of technology or techno-culture must be considered by studies on CALL to account for the 21st-century challenges of teaching and communicating across languages and cultures (Sauro & Chapelle, 2017). However, as teachers and material developers need a mechanism to incorporate innovation into teaching, and because the contexts of language learning and use change rapidly, its utilization is still limited to teachers' skills and attitudes. The spirit of innovation seems to be alive in practices that have yielded so many new options for learning from technological affordances. However, for the diffusion of innovation to take place, teachers and future teachers need to develop an attitude of continual openness (Blau & Peled, 2012). So, the roles of teachers cannot be underestimated during planning, designing, implementing, and assessing a

learning-teaching process. From the initial point to the end, integration of technology into language classes heavily depends on teachers' qualifications (Warschauer & Meskill, 2000). Because the change in technology use in classrooms affects not only learners but also their teachers (Wells, Lange, & Fieger, 2008). Therefore, for teachers, speaking the same language as students, keeping pace with these technological developments, and making these technologies a part of their courses have become extremely crucial.

At this point, preliminary issues that come forward are the pre-service and in-service teacher training programs, which have a significant role in shaping the teaching styles. Teacher training programs are the most suitable environments in providing technical knowledge and expertise to prospective teachers (Luke & Britten, 2007). It is commonly argued that pre-service EFL teachers do not gain necessary skills and knowledge for technology use during their teacher training program (Dudeney & Hockly, 2007; Egbert & Thomas, 2001; Gülbahar, 2008; Hubbard, 2008; Kay, 2006; Kessler, 2006; Koehler & Mishra, 2009; Niess, 2005). Receiving inadequate technology courses during university education may be one of the reasons for the failures in using the technology after graduation. Teacher roles that have been changing with technological developments necessitate teacher education to give importance to technology training (Andersson, 2006). Research proves that teachers need training about technology use for educational purposes (Lei, 2009), and in-service and pre-service teachers' perceptions and attitudes towards the use of technology in language classrooms are positive (Aydın, 2013; Çelik, 2013; Lau & Sim, 2008; Park & Son, 2009). Pajares (1992) postulates that teachers' attitudes rather than knowledge have a much greater effect on determining their classroom implications. In this respect, English teachers, who have positive attitudes towards technology are likely thought to be more successful in integrating technology into courses. On the other hand, their attitudes might also be shaped and influenced by their capabilities. More capable individuals tend to develop more positive attitudes towards a concept. Some studies (Cope & Ward, 2002; Sabzian, Gilakjani & Sodouri, 2013) support this idea revealing that more experienced teachers are more reluctant to use technology in language teaching in comparison to relatively more novice teachers. Their attitudes may result from inadequate knowledge about technology and relatively less exposure to it. This situation also reflects the importance of in-service teacher training programs for providing continuous professional development.

There are various research-based studies on EFL teachers' attitudes and competencies regarding technology use for EFL teaching purposes. To start with, in his research which constitutes the starting point of the present study, Albirini (2006) found that EFL teachers who participated in his survey have positive attitudes towards technology use in EFL classes in the general sense. Moreover,

it is implied in the study that EFL teachers' attitudes towards this subject are highly influenced and shaped by their cultural perceptions, experiences, and competence levels. Similarly, in their study conducted with 37 Indian EFL teachers, Cahyani and Cahyono (2012) found that EFL teachers at all levels have a high level of positive attitudes towards technology use. The results proved that the participants' frequency levels of technology use are all found to be high.

One other study conducted by Gilakjani and Leong (2012) aimed to analyze EFL teachers' attitudes from different perspectives regarding their computer training background, computer experience, and computer literacy. The results revealed that even though teachers may have positive attitudes towards technology use in the classroom, they may feel anxious and unable in doing so. The implications made in the light of their findings are providing continuous professional development services and training for the teachers with the intent of enabling them to keep pace with rapidly emerging and growing new technologies.

In a similar study conducted by Aydın (2013) with 157 EFL teachers in Turkey, it was found out that even though most EFL teachers have positive attitudes towards the abovementioned subject, their self-reported competence and self-confidence levels for integrating technology into classrooms in a multi-dimensional way are not satisfying. His findings also indicate that it is important to keep a continuous technical support for teachers to make sustainable peace with developing ICT technologies. Moreover, as Aydın (2013) states, despite numerous studies targeting to reveal the importance and advantages of technology use in EFL teaching, the number of studies targeting EFL teachers' attitudes and competencies considering the subject is limited, especially in Turkey which is aiming to leap forward in technology use in education as well as many other areas. For this purpose, the present study aims to fill the gap in this field regarding EFL teachers' attitudes and competencies, particularly in the EFL context.

2 Objectives of the study

The present study aims to investigate secondary school EFL teachers' attitudes towards technology use in their classes and their self-reported capabilities in doing so. Furthermore, the ultimate aim of the present study is to raise some suggestions and implications for pre-service and in-service teacher training programs regarding possible drawbacks of EFL teachers in using technology for a more comprehensible understanding of target language with its patterns. In this context, the following questions are aimed to be answered in the light of the quantitative and qualitative data:

1) What are EFL teachers' attitudes towards using technology in their classes for more comprehensible language learning and their capabilities in doing so?

2) What are the reasons for EFL teachers' possible negative attitudes towards technology use in their classes?
3) To what extent do EFL teachers think that they are capable of using technology in their classes?
4) What is the proportion of the variance in the attitudes of teachers toward ICT in education that can be explained by the selected independent variables?

3 Method

This is a descriptive study of an exploratory nature, which includes both qualitative and quantitative data collection methods as one part of the triangulation which is defined as the use of two or more methods for collecting data to analyze human attitudes (Cohen & Manion, 1994).

3.1 Participants

36 EFL teachers (25 females, 11 males) from different experience levels ranging between 1 to 8 years working at secondary schools in a small province of Turkey participated in the study. The technological facilities of each teacher's teaching environment are similar to each other. All participants are selected from government schools equipped with FATİH Project that facilitates government schools and students in Turkey with technological equipment. The target group included 39 teachers. However, 3 teachers did not want to participate in the study for various reasons. So, the number of participants was limited to 36.

3.2 Research instrument

Regarding triangulation for increasing confidence and decrease "method-boundedness" (Cohen & Manion, 1994, p. 234), both quantitative and qualitative research instruments are used. Quantitative data are collected through an adapted version of the questionnaire developed by Albirini (2006). The original version of the questionnaire was adapted regarding the views of three experts in the field working at state universities in Turkey as lecturers. Some terms and statements in the original survey were revised considering the developments in the field. For example, the word "computer", which is the target word in the original survey, has been replaced with Information Communication Techologies (ICT). Additionally, the adapted version of the questionnaire was reviewed, and some statements were retyped in the light of the reviews received from three EFL teachers after piloting. The latest version of the questionnaire included 71 items in total.

3.3 Data collection

At the beginning of the spring semester in the 2019-2020 academic year, data collection was conducted in two steps. First, a questionnaire was conducted with

the participants. To prevent any kind of misunderstanding, all of the participants were visited at their schools and each interview was carried out in person to acquire more reliable results. Second, a focus group interview was conducted following quantitative data analysis. Among the 36 participants of the questionnaire, 5 female and 2 male teachers voluntarily took part in the session which was held in a peaceful environment. A professor expert at educational research and another professor expert in the field were consulted for forming the content of the focus-group interview. The focus group interview was held after quantitative data were analysed so that the questions and the discussions were shaped considering the quantitative findings, which lead the participants to comment on the findings. So, even though flexible conversations appeared, a general outline of the questions to guide the interview was prepared in advance.
Also, regarding ethical issues, official permission was obtained from the provincial Directorate of National Education in the province where the study was conducted to enable teachers to participate in the questionnaire and focus group interviews in addition to visiting the teachers at their schools for implementing the questionnaire. Also, each participant was informed about the fact that their demographic information would be included in the present study and none of their personal information would be shared.

3.4 Data analysis

The data analysis procedure was completed in two steps. First, quantitative data were analyzed using Statistical Package for Social Science (SPSS 22). The reliability of the instrument was determined using Cronbach Alpha. A reliability coefficient of 0.88 was obtained, which indicates that the instrument was reliable for data collection. For a more trustworthy analysis, a lecturer, who is an expert at statistical analysis was consulted for the reliability of the data. For the analysis of the qualitative data obtained from focus-group interview, content analysis was used. Each statement on a particular topic targeted for inquiry is cited under that particular heading to be discussed, along with quantitative findings, to support or object to, in whole or in part. The statements made by the participants during the interviews were grouped according to their themes. While some statements regarding the findings were directly included in the study, some ideas were included as emerging themes.

4 Findings

The findings in this study were evaluated both qualitatively and quantitatively. Since the focus group interview was conducted after the analysis of the quantitative data to comment on the results, quantitative data, quantitative and qualitative data were interpreted interrelated to each other.

4.1 Teachers' attitudes towards ICT in education

Participants were asked to respond to 19 Likert-type statements dealing with their attitudes towards ICT in education (Appendix A). The items aim to measure the affective domain of ICT attitude (items 1-6), cognitive domain (items 7-15), and behavioral domain (items 15-19). ICT attitudes of EFL teachers were represented by a mean score on a 5-point scale, where 5 (Strongly Agree) represents the maximum score of the scale and 1 (Strongly Disagree) represents the minimum score.

Table 1

Distribution of mean scores on the attitude towards ICT scale

Scale	*N*	*Min.*	*Max.*	*Mean*	*Std. deviation*
Affect	36	3.33	5.00	4.36	.481
Cognition	36	3.37	5.00	4.46	.355
Behaviour	36	2.80	5.00	4.46	.519
Overall Attitude	36	3.63	4.95	4.43	.345

SD - strongly disagree (1); D - disagree (2); N - neutral (3); A - agree (4); SA - strongly agrees (5).

Table 1 illustrates the distribution of mean scores on the attitude towards the ICT scale. As Table 1 illustrates, teachers' overall attitudes towards ICT were positive with an overall mean score of 4.43 (SD=0.345). The respondents' positive attitudes were evident within the affective (mean=4.36), cognitive (mean=4.46) and behavioural (mean = 4.46) domains.

In the focus group meeting, all participants stated that they used information communication technologies in their classes, supporting quantitative data, and used expressions that supported each other. When the expressions of the participants in the interview were analyzed, the following statements supported the accepted view that ICT technologies should be included in classes. Some emerging themes regarding the topic are as follows:

"I am trying to incorporate ICT technologies into the content of the course as much as I can." (Participants 2, 4, 5, 7)

"I feel that my lessons have been fruitful after the courses I have integrated with ICT technologies." (Participants 4, 5, 6, 7)

Besides, considering that some teachers may be concerned about using ICT technologies, almost all of the participants supported their colleagues with the idea that *"Using ICT does not scare me under normal conditions."* Additionally, a conversation between three participants considering students' concentration loss appeared in the following way:

"ICT technologies can sometimes give harm to my students' concentration. So I can avoid from time to time." (Participant 3)

"I think that when used correctly, ICT technologies help my students to be more positive towards the lesson." (Participant 2)
"With effective management, its benefits, of course, surpasses its harms." (Participant 5)
Furthermore, all of the participants agreed upon the idea that they wish they had received more education on this issue to develop themselves both technically and pedagogically. As a result, it is seen that quantitative data support qualitative data in general and there can be some technical and pedagogical deficiencies of which some of the participants may not be aware beside their positive attitudes. For example, when one of the participants stated that *"As we started talking about ICT in detail here, I realized the fact that I am not aware of detailed ICT utilization in and out my classes."* (Participant 1), and two other participants showed their agreement with that idea.

4.2 Teachers' perceptions about ICT attributes

Participants were asked to respond to 15 (20-34), Likert-type statements dealing with their perceptions about the relative advantage of ICT (items 20-24), their compatibility with teachers' current practices (items 25-29), their simplicity/non-complexity (items 30-33), and their observability (34).
As Table 2 shows, respondents' perceptions of computers' attributes were positive with an overall mean score of 4.13 (SD=0.313). Respondents' positive perceptions varied across the four computer attributes examined in this study. Teachers' responses were most positive about the relative advantage of computers as an educational tool with an overall mean score of 4.48 (SD=0.420). Less positive were teachers' perceptions of the complexity (before the negative items were reversed) of computers with their current practices with an overall mean score of 3.90 (SD=0.447). Also, respondents' perceptions of ICT's attributes were somewhat positive with an overall mean score of 3.99 (SD=99). Lastly, teachers' responses on the observability subscale indicate positive perceptions (4.00, SD=0.755).

Table 2

Distribution of mean scores on the ICT attributes scale

Scale	*N*	*Min.*	*Max.*	*Mean*	*Std. deviation*
Advantage	36	3.20	5.00	4.48	.420
Compatibility	36	3.00	4.80	3.99	.383
Complexity	36	3.00	4.75	3.90	.447
Observability	36	3.00	5.00	4.00	.755
Overall Attribute	36	3.33	4.80	4.13	.313

SD - strongly disagree (1); D - disagree (2); N - neutral (3); A - agree (4); SA - strongly agrees (5).

The expressions of participants during the focus group discussions were not only close to each other's statements but they were also in parallel with the quantitative data on the contribution of ICT technologies to their courses. However, there were also some points at which the participants disagreed with each other. To consider participants' statements regarding their topics, even though *"ICT-supported EFL courses offer advantages over traditional methods"* (Participants 2, 4, 5, 7) is a generally approved idea, participants also agreed upon the statements that *"Over-adherence to ICT technologies poses some challenges when considering the course length and curriculum requirements and Using ICT can confuse me in some situations."* (Participants 1, 3, 6, 7)
Also, some participants realized the fact that there is still a lot to learn about. For example, while one participant was talking about how capable she thinks about using smart boards, she was interrupted by one another participant who asked her some specific questions, which she could not answer, about two applications. Her reaction was like *"Yeah, I guess I may not be able to cover this issue, contrary to what I thought."* (Participant 2)
Although these qualitative findings support the 'advantage' dimension of quantitative findings, 'compatibility' and 'complexity' dimensions are confirmed relatively less satisfactorily. Thus, it can be thought that the participants lack some of the issues they consider themselves sufficient.

4.3 Teachers' cultural perceptions regarding ICT

Participants were asked to respond to 15 (35-49), Likert-type statements dealing with their Cultural Perceptions regarding ICT. In general, participants' responses to the 16 items on the Cultural Perceptions scale were somewhat positive with an overall mean score of 3.53 (SD=0.348).

Table 3

Distribution of mean scores on the cultural perceptions regarding ICT

Scale	*N*	*Min.*	*Max.*	*Mean*	*Std. Deviation*
Cultural Perceptions	36	2.60	4.13	3.53	.348

SD - strongly disagree (1); D - disagree (2); N - neutral (3); A - agree (4); SA - strongly agree

In the focus group interview, the subject of cultural perception was the topic that participants preferred to remain relatively quiet compared to other sections. The participants expressed that they are not sure that ICT technologies can affect students positively or negatively in cultural and social terms. The most frequently emerging ideas about this topic were that ICT technologies could *"help students interact with the outer world", "cause technology addiction" and*

"separate students from friends and families". In other words, participants were confused about the fact that ICT technologies can help students develop themselves in sociocultural aspects, but it could cause them to be isolated from their environment as a result of careless guiding. Additionally, whether ICT technologies should include more fingerprints from Turkish culture, or the outer world was not discussed by the participants even though the researcher tried to get them into that topic.

4.4 Teacher's self-reported competencies in ICT

Participants were requested to mark 22 (50-71) Likert-type items related to self-reported ICT competences. As Table 4 shows, participants' responses to the 16 items on the Cultural Perceptions scale were somewhat positive with an overall mean score of 3.53 (SD=0.348) in general. However, participants' responses vary. While some of the statements received a high level of positive response, the level of participation in some statements remained neutral. This shows that the participants consider themselves technically sufficient in some subjects while they consider themselves less sufficient or inadequate in some other subjects. Regarding new tendencies in educational technology, it is seen that participants need some aid. For example, the statement "Creating multi-cultural interaction environments for students through telecollaboration or similar network tools" which is relatively a new trend in language teaching for supporting learners' multicultural development through real-life interaction received a low level of agreement with an overall mean score of 3.06 (SD=.984).

Besides, statements regarding the ability to keep up with technological developments and to have discussions with colleagues on this issue have also received a relatively low level of agreement with an overall mean score of 3.75 (SD=.906) and 3.69 (SD=.980), respectively. Also, statements related to making use of smart boards and different multimedia sources, and providing authentic material in the classroom received generally positive answers with overall mean scores of 4.14 (SD=1.018), 4.1 (SD=.622), and 4.19 (SD=.889), respectively.

Table 4

Distribution of mean scores on self-reported competencies in ICT

Statement	*N*	*Min*	*Max.*	*Mean*	*Std. d.*
Installing a new software on a computer	36	1	5	3.50	1.082
Using a printer	36	3	5	4.31	.668
Using a computer keyboard	36	3	5	4.36	.593
Operating a word processing program (e.g. Word)	36	2	5	4.28	.659
Operating a presentation program (e.g. PowerPoint)	36	2	5	4.28	.815

Operating a spreadsheet program (e.g. Excel)	36	1	5	2.92	1.025
Operating a database program (e.g. Access)	36	1	5	2.53	1.183
Using the Internet for communication (e.g. email)	36	3	5	4.33	.676
Using the World Wide Web to access different types of information	36	2	5	4.22	.760
Solving simple problems in operating computers	36	1	5	3.89	.979
Operating a graphics program (e.g. Photoshop)	36	1	5	2.97	1.207
Using computers for grade keeping	36	1	5	3.94	.893
Selecting and evaluate educational software	36	1	5	3.69	1.009
Creating and organizing computer files and folders	36	1	5	4.17	.910
Removing computer viruses	36	1	5	3.08	1.131
Making use of smart boards	36	1	5	4.14	1.018
Benefitting from various multimedia resources	36	3	5	4.11	.622
Keeping pace with new technological developments	36	2	5	3.75	.906
Discussing on new technology-based trends with colleagues	36	2	5	3.69	.980
Creating multi-cultural interaction environments for students through tele-collaboration or similar network tools	36	1	5	3.06	.984
Providing authentic texts, audios or videos through internet	36	2	5	4.19	.889
Encouraging students for a better ICT utilization for further grasp of the target language with all its patterns.	36	2	5	3.75	.770
Overall ICT Competence	36	2.55	4.73	3.78	.491

SD - strongly disagree (1); D - disagree (2); N - neutral (3); A - agree (4); SA - strongly agrees (5).

During the focus group interviews, participants used various expressions about how well equipped they think they are in ICT technologies. In addition to the participants who think they are quite sufficient in the technical sense, some participants think they are quite inadequate in terms of software usage. Aside from their technical competence, it is remarkable that the participants quite lack implementing the technologies in the classroom. Especially in the case of telecollaboration, the expressions used in focus group interviews have shown that qualitative data seem to be even more positive than they are. Almost all of the participants in the focus group interview were united around the fact that they *"cannot even fully define the term telecollaboration"*.

Another issue that participants agreed upon regarding ICT in education is the expectation of being provided with increased level of facilities to keep pace with new technological developments. Also, it was suggested by the participants that the education they received at the university and the training they are receiving during the seminar periods seem to be insufficient for them to develop themselves in this aspect and that the school administration and the Ministry of National Education should be more supportive. Some of the participants express their views as follows:

"I don't think that the education I received at the university has trained me enough on this subject." (Participant1)

"Within the scope of in-service training, training should be provided to improve our ability to use technology." (Participant 3)

"I would like our school administrators to give us more opportunities to develop our technology using skills." (Participant 6)

"Ministry of National Education should provide more support to teachers in this aspect." (Participant 7)

On the other hand, some participants were observed to be pleased with their pre-service and in-service training regarding this topic. They claimed that the training they received at undergraduate levels or in-service training they have been taking since they started working as teachers are not insufficient. However, after discussing with their colleagues about the topic, their positive tendencies seemed to have changed slightly to the point of 'it could be better'.

4.5 Proportion of variance in teachers' attitudes explained by the independent variables

A multiple regression analysis was performed to determine the proportion of the variance in teachers' attitudes toward ICT in language teaching which might be expressed by the three independent variables which are ICT attributes, cultural perceptions, and ICT competence. Simple correlations, using Pearson analyses, were first performed to identify independent variables that are in correlation with the attitudes toward ICT dependent variable. To obtain a more accurate prediction of the attitude variable and for showing the proportion of variance in that variable explained by the three independent variables, these variables were used in the multiple regression equation.

Table 5

Correlation analysis of the independent variables for the dependent attitude variable

	N	*r*	*p*
Overall attribute	36	.728**	.000
Cultural perceptions	36	.529**	.001
ICT competence	36	.300	.076

As Table 5 shows, the independent variables that correlate with the attitude variable are attribute (r=728, p=.000) and cultural perception (r=529, p=.001). No significant correlation is determined with the ICT competence independent variable (r=.300, p=.076).

Table 6

Analysis of variance

Sources	*Sum of Squares*	*DF*	*Mean Square*	*F value*	R^2	*Adjusted* R^2	*p*
Model	2.348	3	.783	13.696	.562	.521	.000[b]
Error	1.829	32	.053				
Total	4.177	35					

Furthermore, the summary of the multiple regression results is presented in Tables 6 and 7. The results shown in Table 6 indicated that 52% of the variance in computer attitude was explained by the independent variables included in this study. The test statistic was significant at the 0.05 level of significance (p=.000[b]).

Table 7

Multiple regression on a dependent variable (computer attitude)

Model	*Unstandardized b*	*Standardized b*	*t*	*p*
ICT attributes	.655	.595	4.024	.000
Cultural perceptions	.173	.175	1.222	.231
ICT competence	.086	.123	1.012	.319

As it is observable in Table 7, the results of multiple regression indicate that only one variable affects the teachers' attitudes toward ICT at the 0.05 level of significance despite the level of significant correlation with cultural perceptions (Table 5). The analysis suggests that the determinant independent variable explaining the significant amount of variance in ICT attitudes is ICT attributes (b=0.595, t=4.0324, p<0.05).

5 Discussion

This study investigated the attitudes and self-reported capabilities of secondary school EFL teachers in a Turkish province towards ICT and the relationship betwen teachers' attitudes and a selected set of independent variables. In this section, the research questions will be answered and evaluated in the light of the findings obtained within the scope of the study and comparative interpretations will be made with similar studies in the literature.

What are EFL teachers' attitudes towards using technology in their classes for more comprehensible language learning and their capabilities in doing so?

Background knowledge about a topic is, of course, an important determinant of a person's competence in it. However, the importance of attitude towards a phenomenon should not be underestimated. Pajares (1992) claims that teachers' attitudes rather than knowledge have a much greater effect on determining their classroom implications. In this respect, both quantitative and qualitative data revealed by the present study show that EFL teachers working at the secondary school level consider it important to benefit from technology in language teaching. Partcicipants, to a great extent, agree that they need to make language learning process more efficient by applying cognitive and affective means with the help of technology. The results obtained from this study are consistent with the findings of the similar studies (Albirini, 2006; Aydın, 2013; Çelik, 2013; Lau & Sim, 2008; Park & Son, 2009).

What are the reasons for EFL teachers' possible negative attitudes towards technology use in their classes?

The results in this study prove that teachers do not have a significant negative attitude towards using technology. However, some findings suggest that there may be some situations where teachers can avoid using technology. The reasons for these probable negative attitudes could be teachers' negative self-efficacy beliefs at some points, and their concerns such as class hours and curriculum limitations. At this point, it can be taken into consideration that they cannot use the course hours efficiently because of possible technological requirements. They cannot keep the students under control, especially outside the school and they are worried about keeping up with the innovations that are emerging every day. Also, the importance of teacher training in technology use should not be underestimated (Andersson, 2006; Lei, 2009; Luke & Britten, 2007). The participants' complaints about not getting enough support from the school administrators and the MoNE for professional development cannot be underestimated. Also, some participants' negative attitudes towards technology use might have resulted from their low self-efficacy perceptions on technology use.

To what extent do EFL teachers think that they are capable of using technology in their classes?
Both the results of the qualitative and quantitative data revealed that teachers have very different ideas about using technology effectively in their courses. The point that teachers feel most incomplete is being able to master the technical equipment. They even have difficulties in using smartboard applications, which are the most intensively used tools in classrooms. They agree that they need to be supported with professional development activities to overcome this technical inefficiency. Because every year different practices emerge, and teachers need to refresh their knowledge on these practices both through central resources and in consultation with their colleagues. Moreover, it can be concluded that the participants' self-efficacy beliefs in technology use in education are not the problem they faced today because they mostly agree that they are dissatisfied with the education they received at university. This inference supports the claims of Dudeney and Hockly (2007), Egbert and Thomas (2001), Gülbahar (2008), Hubbard (2008), Kay (2006), Kessler (2006), Koehler and Mishra (2009), and Niess (2005) about the inadequacy of graduate-level teacher training programs regarding prospective teachers' techno-cultural awareness and competence levels.

What is the proportion of the variance in the attitudes of teachers toward ICT in education that can be explained by the selected independent variables?
In the light of the correlation and regression analysis, it is conceivable that participants' attitudes toward ICT utilization in EFL teaching processes, in parallel with Albirini (2006), is in a very strong correlation with their perceptions of ICT attributes in the process. On the other hand, in contrast to some previous studies with the developing technology and the indisputable influence of globalization all over the world, teachers' attitudes towards ICT utilization in their classes are found not to be influenced by either their cultural perceptions or their self-reported competence levels (Albirini, 2006; Al-Oteawi, 2002; Na, 1993; Pelgrum, 2001). This result can be a strong claim about the fact that neither their computer skills nor their cultural perceptions have significant negative influences on EFL teachers' attitudes towards ICT utilization for their profession.

Conclusion
What makes the results of the present study significant is that teachers, the implementers of any educational policy or strategy, are central to the research. Instead of researching whether technology utilization is a determinant factor for a better EFL teaching environment or not, the perceptions of the teachers on this subject are investigated. Considering this context, rather than discussing the

importance of technology integration in the English language teaching process, it seems more important to get information about whether teachers are aware of this variable with its different dimensions or not. This research intended to address the techno-cultural awareness and proficiency levels of secondary school English teachers. However, the study reveals significant and representative results because the teachers included in the study are individuals with the same educational levels, they have graduated from different universities in Turkey, and their working environments somewhat reflect the average state secondary school environments in Turkey. The findings also showed that teachers who participated in this study have positive attitudes towards the use of technology in the general sense and they emphasize the role of technology in making significant contributions to the foreign language learning process.

Furthermore, some of the participants consider themselves insufficient in this issue to some extent. They think both the pre-service education they have received, and the in-service training they take within the policies of MoNE are insufficient and more professional development activities need to be held. So it can be stated that both teacher training and in-service training programs should be reviewed and revised in line with the needs of learners and teachers. Although the advances in technology are innovative, it is the teacher who will be responsible for the implementation of the new technology in the classroom. Therefore, to have a satisfactory practice in teaching in the classroom with respect to recent innovations in technology, teachers' needs and expectations in this sense should be taken into consideration by the authorities and they should take the necessary steps.

It is expected that this study would be a great help of the researchers who will study the same or similar topics. As for the limitations of this study, the number of the participants used as a sampling group (n=36) is not big enough to represent the whole group because they were chosen as a convenience sampling. Additionally, the number of participants in the focus group interview was limited to 7 even though it was planned to be at least 13. The reasons for this were the difficulty in capturing the intervals at which all teachers were available at the same time and the unwillingness of some teachers to participate in the interview for various reasons. Efforts to increase the number of participants could not be successful due to the social distance measures and health considerations caused by the COVID-19 pandemic during the data collection period. Although the study scale has been prepared with the necessary consultations and pilot implementation, it is recommended that the sample size should be considered relatively low and that the content of the study should be repeated with more participants from different studies. In a word, further research can be conducted with more participants from different fields using various data collection techniques.

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Adjustment to School as the Predictor of School Burnout in University Students

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Abstract:

Introduction: Burnout emerges as a common problem during the university period when social competition and expectations from the individual increase, and daily life becomes increasingly complicated due to augmenting stress factors. The aim of this study was to examine whether the school burnout of university students can be predicted significantly by adjustment to school.

Methods: This study used a correlational survey model to investigate the burnout levels of university students in terms of their adjustment to university life. The sample of the study comprised a total of 334 students, enrolled in four different faculties of a university in Turkey. The data of this research were collected by using the "Adjustment to University Life Scale (AULS)", "The Maslach Burnout Inventory-Student Form (MBI-SF)" and personal information form.

Results: The findings obtained in this study showed that academic, social, and personal adjustment to university life among university students negatively and significantly correlated with school burnout that students experienced. In addition, personal, social and academic adjustment variables together significantly predict each of the exhaustion, cynicism and efficacy variables.

Discussion: According to these results, academic, social, and personal adjustment to university life among university students negatively and significantly correlated with school burnout that students experienced. This situation indicates that as students' academic, social, and personal adaptation to university life increases, they will experience less emotional burnout, become less cynical of their environment, and feel less personal inefficacy. In this context, it is thought that interventions that support adaptation to university life are an important factor that will protect students from the negative effects of burnout.

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Limitations: The sample of this study is limited to 334 participants. In addition, the findings of the study are limited to the sincere response of the participants to the instruments of the study and the qualifications of the measurement tools. In other words, this research has no claim of generalizability.
Conclusions: According to the findings of the study, students with high adjustment to university life experience less academic burnout. In this context, both individual and group work to be conducted by the guidance and psychological counseling units of universities gain importance. It will be particularly beneficial to conduct studies for adjustment to university life, such as psycho-education, group psychological counseling, or peer guidance.

Key words: adjustment to university, school burnout, academic achievement, university students, school counseling.

Introduction

Every year hundreds of thousands of students coming from different cities and cultures go through various tests and step into university life in Turkey like all over the world. The number of students placed in a university in Turkey, which has about 85 million population, has been announced as 781.165 as of 2020 (Turkish Student Selection and Placement Center, 2020). Although university life is an important step for the future of individuals, it also means a change of the current lifestyle for them (Mostert & Pienaar, 2020; Özhan & Boyacı, 2018). With the onset of university life, a significant portion of the students leave their families and social environment for the first time, and they try to adjust to a new life in this process (Roksa, Deutschlander, & Whitley, 2020; Thurber, & Walton, 2012). Studies on adjustment to university, carried out in almost every part of the world, emphasize that adjustment to university life is a stressful process that challenges the individual (Gfellner & Córdoba, 2020; Holliman et al., 2019; Liran & Miller, 2019; Wider et al., 2017). In the process of adjustment to university life, while individuals experience psychological, academic and social difficulties, on the one hand, they also struggle with economic difficulties (Özhan & Boyacı, 2018; Paramo-Fernandez et al., 2017). In other words, university life, which is an important and necessary step for the future of individuals, can be a challenging process for them. Considering that university students will assume important roles in the near future of the country, it is clear that their current capacity should be investigated and developed and that they should be contributed so that they can achieve a great deal in academic and social areas of life.

Studies on adjustment to university state that variables, such as life satisfaction, perceived social support, psychological capital, family relationships, social self-efficacy, and appreciation, facilitate the individual's adjustment (Alsubaie, Stain, Webster, & Wadman, 2019; Boyacı, 2019; Holliman et al, 2019; Kim, 2019; Liran & Miller, 2019; Paramo-Fernandez et al., 2017). Knowledge of only the variables that facilitate the adjustment of the individual will not be enough to understand the process of adjustment to university in all aspects. To fully understand this process, it is also necessary to know the factors that negatively affect individuals' adjustment to university (Özhan and Boyacı, 2018) and their needs (Chacón-Cuberos et al., 2018). The change that comes with university life can bring some concerns and problems about the future. Studies show that, with the start of university life, individuals have different problems, such as concerns for being criticized, loneliness, longing for family, lack of institutional affiliation, shyness, depression, and anxiety disorders (Aslan, 2015; Kim, 2019; Liran & Miller, 2019; Mostert & Pienaar, 2020; Petersen, Louw, & Dumont, 2009). School guidance and counseling services aim to help students to cope with these difficulties.

In addition to problems regarding adjustment to university stated in the literature, another important problem, which negatively affects both academic achievements and well-being of students, is school burnout (Chang and Lee, 2020; Salmelo-Aro & Read, 2017). Maslach (1982) conceptualizes burnout as a multi-dimensional structure consisting of three interrelated components. The three components that make up this multidimensional structure of the phenomenon of burnout are stated to be exhaustion, cynicism, and ineffectiveness. When the current literature on the phenomenon of burnout, a concept which was first used in working life and then in the academic field, is examined (Maslach et al., 2001; Walburg, 2014), it is seen that burnout is now considered to be an important problem experienced by individuals in almost every age group (Boyacı & Özhan, 2018; Seibert, May, Fitzgerald, & Fincham, 2016). In other words, burnout is now considered not only as a phenomenon related to job but also as a phenomenon that has been studied by various fields and has implications for the lives of individuals from various parts of society (Leskovic, Vukovič, Leskovar, & Goriup, 2016; Goriup, Stričević, & Sruk, 2017).

It is emphasized by the majority of researchers that burnout experienced by students in schools and burnout experienced in business life have something in common. Although the environment in which burnout is experienced is different, school/academic burnout and burnout in job cause similar emotional, physical and psychological problems in the individual and this situation creates the phenomenon of school burnout (Asikanen et al., 2020; Salmelo-Aro et al.2009). The concept of school burnout can generally be defined as getting exhausted due

to academic demands, developing negative attitudes towards school and school activities, and the emergence of perceived inadequacy towards school, and it is sometimes conceptualized as "student burnout" or "academic burnout" in the literature (Boada-Grau et al., 2015; Salmelo-Aro & Read, 2017; Seibert et al., 2016). The burnout experienced by students at different levels of education due to school-related activities and school life negatively affects many academic and affective outcomes related to the teaching-learning process, especially the academic achievement, happiness, and well-being of the students, and it seen as a major problem in front of the individual's development process with this respect (Boyacı & Özhan, 2018; May, Bauer, & Fincham, 2015; Walburg, 2014). Burnout emerges as an even more common problem compared to the past during the university period, when social competition and expectations from the individual increase, and daily life becomes increasingly complicated by augmenting life stress factors. When the efforts made by individuals to adapt to this change push their existing potential, the likelihood of emergence of burnout rises (Dandar, Grigsby, & Bunton, 2019; Lin & Huang, 2014). This study aimed to reveal the relationship between burnout and adjustment to university. For this purpose, the following hypotheses were tested in the study. In summary, considering the argument that it is important to examine the factors related to the quality of life of university students (Čepelová & Barnová, 2020), it is important to examine the relationship between adaptation to university life and burnout. As explained in detail in the introduction, this study draws attention to supporting the adaptation to university life as a protective factor in coping with burnout, which is an important risk factor that threatens the well-being, quality of life, success, and development of university students in general.

1 Research hypotheses

H_1: Academic, social, and personal adjustment negatively and significantly predicts exhaustion, which is a component of school burnout in university students.

H_2: Academic, social, and personal adjustment negatively and significantly predicts cynicism, which is a component of school burnout in university students.

H_3: Academic, social, and personal adjustment negatively and significantly predicts efficacy, which is a component of school burnout in university students.

2 Method

2.1 The research model

This study used a correlational model to investigate the burnout levels of university students in terms of adjustment to university life. Following the nature of correlational model, this study investigated the extent to which independent variables represented as academic, social, and personal adjustment to university life predicted school burnout (Creswell, 2012; Fraenkel, Wallen, & Hyun, 2012).

2.2 The study group

The study group consisted of a total of 334 students, including 111 males (33.2%) and 219 females (65.6%), enrolled in four different faculties of a university in Turkey. Four students (1.2%) in the study group were determined to not have stated their gender. The ages of the students in the study group varied between 17 and 38, and the mean age was 19.81 years.

2.3 Data collection tools

The study data were collected using three data collection tools, namely, a Personal Information Form, the Adjustment to University Life Scale (AULS), and the Maslach Burnout Inventory-Student Form (MBI-SF).

2.3.1 The Personal Information Form

This form was created within the scope of this research to collect data about the demographic characteristics of the university students participating in the study. The form included items questioning demographic information, such as age, gender, and the faculty.

2.3.2 The Adjustment to University Life Scale (AULS)

This scale was developed by Aslan (2015) to obtain information about the level of adjustment to university life in university students. The Turkish form of the scale, which was developed as a result of validity and reliability studies conducted on university students, consists of three components, each of which has 20 items and is named as personal adjustment, social adjustment, and academic adjustment. The scale has a total of 60 items and a 5-point Likert-type rating structure and yields three different scores regarding the adjustment of students to university life. Increased scores obtained from the subscales of the scale refer to increased adjustment, while low scores indicate decreased adjustment. This structure of the AULS, which consists of three subscales and 60 items, explains 78.16% of the total variance regarding adjustment to university life. Besides, in the confirmatory factor analysis conducted during the development study of the scale, the goodness of fit index values of the scale was calculated as ($\chi 2/df$)=3.39, CFI=.93, IFI=.93, SRMR=.07, and RMSEA=.08. In

the reliability analyses, Cronbach's Alpha internal consistency coefficient of the scale was found as α=.92 for personal adjustment, α=.89 for social adjustment, and α=.93 for academic adjustment. The reliability of the scale was re-analyzed for the study group of this research. Accordingly, Cronbach's Alpha of the scale was found as α=.87 for personal adjustment, α=.82 for social adjustment, and α=.88 for academic adjustment. Sample items related to the scale are as follows: *"I1: I feel like a part of this university."; "I2: I attend classes willingly."; "I3: I spend efforts to make new friends at this university."*

2.3.3 The Maslach Burnout Inventory-Student Form (MBI-SF)

This scale was developed by Schaufeli et al. (2002) to determine the burnout levels of university students, and it was adapted to the Turkish context by Çapri, Gündüz, and Gökçakan (2011). During the adaptation study by Çapri et al. (2011), the Turkish form of the scale was determined to have 13 items under three components, namely, exhaustion (5 items), cynicism (4 items), and efficacy (4 items). The scale has a 5-point Likert-type rating structure. Three separate burnout scores of university students can be calculated through the scale. In the confirmatory factor analysis performed during the adaptation study of the scale, the goodness of fit index values of the scale was calculated as ($\chi 2/df$)=2.87, CFI=.98, GFI=.97, AGFI=.95, SRMR=.037, and RMSEA=.049. In the adaptation study of the scale, Cronbach's alpha internal consistency coefficients calculated for the scale were reported as α=.76 for exhaustion, α=.82 for cynicism, and α=.61 for efficacy. The reliability of the scale was re-analyzed for the study group of this research. Accordingly, the reliability coefficient (Cronbach's Alpha) of the scale was calculated as α=.84 for exhaustion, α=.86 for cynicism, and α=.65 for efficacy. Sample items related to the scale are as follows: *"I1: I feel emotionally fed up with my lessons."; "I2: Since I started my education, my interest in lessons has decreased."; "I3: I can effectively solve the problems I encounter in my lessons."*

2.4 Data collection and analysis

The data collection process of the research was carried out at the beginning of the spring semester of the 2019-2020 academic year. The research process started with obtaining the necessary legal permissions. Afterward, the research data were collected by a single researcher in the classroom using a paper-pencil test format. Before starting to collect research data, firstly, the participants were informed about the problem, purpose, and importance of the research, and the necessary instructions regarding the research were presented. After that, the data collection tools used in the research were administered to students who volunteered to participate in the study. It took the students about 20 minutes to fill out the data collection tools used in the study. At the end of these processes,

the data collection tools of the research were administered to a total of 356 students, and the data collection process was completed.

After the data collection process was completed and the data were entered into a database file, the data set was examined in terms of whether there were missing and/or erroneous data. In the analysis and evaluation of missing data, the rate of acceptable unanswered items was determined as 5% (Creswell, 2012). At this point, the data of 12 students containing more than 5% unanswered items were removed from the data set. Then, the extreme values and the normality of the distribution in the data set were examined. Univariate extreme values in the data set were analyzed using histogram graphs, box graphs, and calculated z scores with the IBM SPSS software package. On the other hand, multivariate extreme values deviating from the normal distribution were analyzed by calculating Mahalanobis distance coefficients. Accordingly, the data of a total of 10 students determined to be extreme values were excluded from the data set of the study. After these analyses, the research data set was found to include no more extreme values and to have normal distribution as can be seen from the kurtosis and skewness coefficients given in Table 1. Eventually, the analysis of the research data was carried out based on the hypotheses on the final study group consisting of 334 participants.

In the analysis of the data, first, descriptive statistics related to the variables included in the hypotheses formed within the scope of the research were calculated, and then the correlations between these variables were examined with Pearson's product-moment correlation analysis. After determining that there were significant correlations between variables, separate regression models were established for each of the dependent variables of exhaustion, cynicism, and efficacy to test whether these variables were significantly predicted by predictive variables of personal adjustment, social adjustment, and academic adjustment. The mentioned analyses were carried out using IBM SPSS 22 software package, and the significance value was accepted as $p<.05$ in the interpretation of the results of the analysis.

3 Findings

3.1 Descriptive statistics

Pearson's correlation coefficients were calculated to reveal the correlations between the variables in the regression models established in the study. In addition, descriptive statistics regarding these variables were also done. The results of the correlation analysis and descriptive statistics regarding the research variables are presented in Table 1.

Table 1

Correlation values between the variables and descriptive statistics

	1	2	3	4	5	6
(1) Exhaustion	---	.76**	.30**	-.45**	-.54**	-.43**
(2) Cynicism		---	.31**	-.49**	-.55**	-.45**
(3) Efficacy			---	-.43**	-.47**	-.55**
(4) Social adjustment				---	.65**	.50**
(5) Personal adjustment					---	.57**
(5) Academic adjustment						---
$\bar{X}$	13.72	9.18	11.50	73.26	65.14	68.26
Ss.	4.70	3.89	3.02	9.24	12.25	13.13
Kurtosis	-.24	.49	-.24	.54	-.10	-.24
Skewness	.70	.99	-.30	-.55	-.38	-.07

**p < .001

In this study, the status of school burnout experienced by university students has been conceptualized under three components, namely; exhaustion, cynicism, and efficacy. As seen in Table 1, moderate and significant negative correlations were found between university students' score from the exhaustion component, which is the first component of burnout, and social (r=-.45, p<.01), personal (r=-.54, p<.01), and academic (r=-.43, p<.01) adjustment scores. Similarly, there was a moderate and significant negative correlation between the cynicism scores of the students in the study group and their social (r=-.49, p<.01), personal (r=-.55, p<.01), and academic (r=-.45, p<.01) adjustment scores. The efficacy scores, which represent the third component in the conceptualization of burnout, had a moderate and significant negative correlation with social (r=-.43, p<.01), personal (r=-.47, p<.01), and academic (r=-.55, p<.01) adjustment scores, being consistent with the other two burnout components. This shows that as the adjustment to university life increases, students experience less burnout, and the sense of emotional exhaustion, cynicism, and reduced efficacy that students who have adapted to university life more socially, personally, and academically will fall.

3.2 Inferential statistics

Multiple linear regression analysis was conducted to analyze whether university students' adjustment to university life significantly predicted burnout. In this analysis, the variables representing the basic components of burnout, namely; exhaustion, cynicism, and efficacy were separately predicted (dependent) variables, while social, personal, and academic adjustment, which were the components of adjustment to university life, were independent (predictive) variables. Thus, three different regression models established separately for each

dependent variable were tested. The results of the analyses are presented in Table 2.

Table 2

Prediction of burnout by adjustment to university life

Predicted	*Predictive*	*B*	*β*	*t*	*p*	*R*	R^2	*F*
Exhaustion	Constant	31.70		18.29	.000	.567	.322	52.25**
	Personal Adj.	-.14	-.35	-5.47	.000			
	Social Adj.	-.07	-.14	-2.30	.022			
	Academic Adj.	-.06	-.16	-2.84	.005			
Cynicism	Constant	25.30		18.03	.000	.592	.351	59.40**
	Personal Adj.	-.11	-0.33	-5.25	.000			
	Social Adj.	-.08	-0.19	-3.25	.001			
	Academic Adj.	-.05	-0.16	-2.95	.003			
Efficacy	Constant	23.30		21.36	.000	.590	.348	58.59**
	Personal Adj.	-.04	-.17	-2.66	.008			
	Social Adj.	-.04	-.12	-2.06	.040			
	Academic Adj.	-.09	-.39	-7.07	.000			

**p < .01

As seen in Table 2, the variables of social, personal, and academic adjustment predicted the exhaustion variable negatively and significantly (R=.567, R^2=.322, p<.01). Accordingly, the variables of social, personal, and academic adjustment together explained 32.2% of the total variance of the burnout variable. The standardized regression coefficients (β) and t values indicated that the relative importance level of the predictive effects of independent variables on exhaustion was personal adjustment (β=-.35, t=-5.47), academic adjustment (β=-.16, t=-2.84), and social adjustment (β=-.14, t=-2.30), respectively.

Like exhaustion, cynicism, which was another predicted (dependent) variable of the study, was negatively and significantly predicted by the variables of social, personal, and academic adjustment (R=.592, R^2=.351, p<.01). Accordingly, the variables of social, personal, and academic adjustment together explained 35.1% of the total variance of cynicism variable. The standardized regression coefficients (β) and t values revealed that the relative importance level of the predictive effects of independent variables on cynicism was personal adjustment (β=-.33, t=-5.25), social adjustment (β=-.19, t=-3.25), and academic adjustment (β=-.16, t=-2.95), respectively.

Like the two other dependent variables, efficacy, which was the third and last predicted (dependent) variable of the study, was negatively and significantly predicted by the variables of social, personal, and academic adjustment (R=.590, R^2=.348, p<.01). Accordingly, the variables of social, personal, and academic

adjustment together were found to explain 34.8% of the total variance of the efficacy variable. The standardized regression coefficients (β) and t values indicated that the relative importance level of the predictive effects of independent variables on efficacy was academic adjustment (β=-.39, t=-7.07), personal adjustment (β=-.17, t=-2.66), and social adjustment (β=-.12, t=-2.06), respectively.

The evaluation of the three regression models established in line with the research hypotheses together showed that the variables of exhaustion, cynicism, and efficacy, which are the components of school burnout in university students, were predicted significantly by the personal, social, and academic adjustment variables, which are the components of adaptation to university life. Moreover, it can be said that the predictive power of personal, social, and academic adjustment variables on the components of burnout was cynicism, efficacy, and exhaustion, respectively. When all these results are evaluated together, it is possible to say that students who adjust to university life more personally, socially, and academically may experience less school burnout. In other words, adjustment to university life can function as a significant protective factor that can reduce the occurrence of burnout.

4 Discussion

The findings obtained in this study showed that academic, social, and personal adjustment to university life among university students was negatively and significantly correlated with school burnout that students experienced. At the same time, academic, social, and personal adjustment to university life significantly explained exhaustion, cynicism, and efficacy, which are the components of burnout (Çapri et al., 2011; Dandar, 2019; Kim, 2019; Pisarik, 2009). This situation indicates that as students' academic, social, and personal adaptation to university life increases, they will experience less emotional burnout, become less cynical of their environment, and feel less personal inefficacy. Like the results of the current study, some studies in the literature emphasize that increased adjustment capacity of the individual will decrease burnout (Asikainen et al., 2020; Chang & Lee, 2020; Walburg, 2014).

According to the literature, academic burnout results from two factors, namely, inadequate resources of the individual and maladjustment (Kim, 2019; Walburg, 2014). The first of these means that the student does not have enough potential to do what is expected of them at school and to successfully complete the tasks at school (Aguayo et al., 2019; Dandar et al., 2019). Another factor that causes students to experience school burnout is the discrepancy between the student's wishes, in other words, expectations from himself/herself and the expectations of their family, friends, and teachers (Chacón-Cuberos et al., 2020). The findings of the current study also supported this situation. According to the results of the

study, personal and social adjustment negatively predicted the individual's burnout.

Difficulties encountered along with university life can cause different problems, such as depression, anxiety, and stress (Mostert & Pienaar, 2020; Wider et al., 2017). As a result of these problems, the individual can become estranged from school and can be exhausted academically. The findings of the current study showed consistency with the literature in this respect, too (Páramo-Fernández et al., 2017; Holliman et al., 2019; Gfellner & Córdoba, 2020). In this context, the need for preventive studies to be conducted by psychological counselors working in school guidance and psychological counseling services is increasing every other day. Mercan and Yıldız (2011), who investigated the psychological guidance needs of freshmen at university, stated that they wanted to benefit from psychological support services in coping with stress, increasing academic achievement, career planning, communication skills, social anxiety, problem solving, anger control, and time management.

Conclusions and recommendations

In conclusion to the results of the current study, academic, social and personal adjustment to university life was negatively and significantly correlated with school burnout that students experienced. Besides, exhaustion, cynicism, and ineffectiveness, which are the components of school burnout, were also significantly predicted by school burnout. According to the findings of the current study, students with high adjustment to university life experience less academic burnout. In this context, both individual and group work to be conducted by the guidance and psychological counseling units of universities gain importance. It will be particularly beneficial to conduct studies for adjustment to university life, such as psycho-education, group counseling, or peer guidance (Boyacı, 2016; Boyacı & Özhan, 2018). It is important to support the findings of the current research with experimental studies on this topic. Therefore, researchers who are planning to conduct a study on this topic can conduct experimental studies and test the effectiveness of the results.

In addition to the significant results revealed by this study, it is also considered to be important regarding the sample group. The review of the literature has shown that there are relatively few studies on adjustment to university life in university students and related factors. At this point, this study is also considered important in terms of increasing the knowledge on adjustment to school, which has an important place in school guidance and psychological counseling services. In addition, this study was not limited to the first-year university students but covered all.

Universities in many countries of the world have switched to distance education, especially due to the COVID-19 pandemic. This is considered very valuable in

terms of students' health but receiving distance education in the first year may create a risk factor for university students in terms of adjustment to university (Moorhouse, 2020). This is because students in this period face two different and important tasks, such as adjusting to the distance education system and the university education process at the same time. For this reason, it is recommended that guidance and psychological counseling services to be carried out in universities should be conducted accurately, adequately, and timely, especially during the pandemic process. While these studies are carried out, making use of distance education opportunities and technology is considered valuable in terms of reaching more students at the same time.

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Attitudes of University Professors towards Distance Education during the COVID-19 Pandemic

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Abstract:
Introduction: With the spread of the COVID-19 pandemic, we wanted to study the attitudes of university professors towards distance education during the home-quarantine period.
Methods: The sample of the study included 426 professors from 37 universities across the country. The study used the questionnaire as a tool to collect information, based on electronic distribution. Besides, the descriptive method was used to analyse the results.
Results: Findings revealed positive trends among university professors towards distance learning during the home-quarantine period. In addition, the results indicated that distance learning can be adopted by both sexes without any additional special features. Moreover, the finding demonstrated positive attitudes towards distance learning with non-significant differences concerning their speciality. It means that professors' speciality was not a hindrance in the distance learning process. Furthermore, the results suggested that distance learning could be one of the promising pedagogical technologies for higher education in Algeria.
Discussion: We conclude that the distance learning is a good alternative to the classic traditional system. Also, it facilitates the training and qualification process for the student. Moreover, professors have a positive attitude towards the distance learning process. In addition, the gender and the academic speciality do not affect the attitude among professors towards the use of distance learning.
Limitations: The study results are only regionally generalisable because the study data were only collected in Algeria.
Conclusions: Distance learning is a good alternative in these current circumstances. In addition, professors have a positive attitude towards the distance learning process.

Key words: COVID-19 pandemic, distance learning, attitude, gender, speciality.

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Introduction

Nowadays, technology has invaded our daily lives and has become an indispensable part of it (Pesti, Tamášová, Lajčin, & Bodonyi, 2021). Education is one of the most significant fields in which technology has been invested. Several forms of education have emerged, including E-learning, M-learning, and U-learning. Those last represent distance learning (Moreira, Santos Pereira, Durão, & João Ferreira, 2018). Moreover, higher education students are becoming consumers of technology, especially the social media when they use it for educational purposes (Torun, 2020).

Algeria has been engaged in efforts to digitize higher education and scientific research; as it has drawn up a program since mid-February 2006. And this is through the establishment of the National Committee for Virtual Education; in cooperation with UNESCO, the European Commission and the Cooperative Program with Switzerland' 'Coselearn' (cursus, 2005).

At the beginning of the 2013/2014 season, Algeria launched the national distance learning project, In order to improve framing and the quality of formation in the school. Where it aims to achieve objectives divided into three phases.

At the end of 2019, a new outbreak of the viral disease was announced (COVID-19) and the situation was declared a pandemic on March 11, 2020 (WHO, 2020). Due to COVID-19, distance learning increased rapidly during the 2020 academic year. At the same time, online learning was perhaps the only realistic response to the health crisis (Metzgar, 2021).

In Algeria, the Ministry of Health declared the registration of the first case of the Coronavirus, COVID-19, on February 25, 2020 (Ministry of Health and Population, 2020). On March 12, 2020, the study was suspended after new cases have been recorded that express the spread of the pandemic. Universities have adopted distance education as a solution to continuing teaching.

In this article, due to the outbreak of the COVID-19 pandemic, we study the attitudes and differences in these attitudes towards the use of distance education during the home-quarantine period by university professors in Algeria according to sex and speciality. In addition, our research aims to answer the following questions:

1. During the home-quarantine period, what is the nature of the attitudes of professors at the University of Algeria towards distance learning?
2. In terms of gender, are there any significant differences in the attitude of professors towards distance learning?
3. In terms of academic speciality, are there any significant differences between the professors' attitudes towards distance learning?

This study aims to:

1. Evaluate the attitudes of Algerian professors towards distance education;

2. Find out about the extent of the university's ability to engage in the endeavour of distance learning;
3. Find out about the difference in the perceptions of professors about distance learning according to gender or academic specialization?

The rest of this article is organized as follows: Section 2 describes the literature review. Section 3 introduces methods and materials. Sections 4 and 5 provide results and discussion. Finally, Section 6 summarizes the paper.

1 Literature review

With the rapid spread of COVID-19 pandemic, distance learning has become very important. Therefore, many several studies have been conducted on this topic. This section describes the relevant works related to the field of distance learning.

In the research study by Moreira, Santos Pereira, Durão, and João Ferreira (2018), the authors surveyed the views of professors in higher education regarding M-learning. Besides, they have also identified the needs of professors related to mobile technology and how they can be used to facilitate the participation of students within and outside the classroom. The study sample included 70 professors (37 Portuguese and 33 Spanish). The gender of most respondents was male (67.1%). Thus, the majority of professors were between the ages of 41 and 50 (55.7%). The obtained results conclude that the majority of professors know how to perform the most trivial task with mobile devices and high results about the utilization of both augmented reality and gamification applications.

Teachers' approaches to distance education are determined by Çelen, Çelik, and Seferoğlu (2013). There are 95 professors in the research sample (36.85% male and 63.15% female). The majority of participants decided to engage in activities for distance learning. Professors have stated that distance education programs are ineffective in terms of content, materials used, methods of assessment, the quality of the certificate taken at the end of distance education, and employment opportunities. In addition, more than half of the participants believed that the Turkish Open University courses were not adequate; they did not trust about half of the participants in the Turkish distance education program.

The Al-Emran et al.'s (2016) research aims to examine the attitudes of students and educators towards the use of M-learning in Oman and UAE higher education universities. 383 students and 54 instructors from five universities are involved in this study. The findings showed that the genders of both students and educators have a positive attitude towards M-learning, and there is no significant difference, which indicates that both men and women can adopt M-learning without any other special characteristics. Moreover, results showed that almost all educators have positive attitudes towards M-learning with no significant

difference in their academic ranks, academic experience, and smartphone ownership, suggesting that M-learning can be adopted by all educators. Besides, the results showed that mobile learning can become one of the promising pedagogical innovations used in higher education environments in the Arab Gulf countries (Al-Emran, Elsherif, & Shaalan, 2016).

In Uzunboylu and Ozdamli's research (2011), the research sample included 467 teachers from Cyprus' various universities. The outcome showed that the attitudes of male instructors were more positive than female instructors towards M-learning. In addition, teachers showed above-average levels of perception towards M-learning.

Alwraikat and Al Tokhaim's (2014) study aimed to investigate the attitudes of faculty members towards mobile learning at King Saud University. The study sample included 362 faculty members from King Saud University in Saudi Arabia. The findings showed that faculty members' attitudes toward mobile learning are positive. In addition, there are statistically significant differences attributed to sex in favour of female faculty members, academic rank in favour of instructor, and academic experience in favour of 21 years of experience and more.

2 Methods and materials

2.1 Participants

The study data were collected from 426 study participants. All participants were university professors of more than 35 universities across the country. In addition, the sample size consists of 142 (33.3%) females and 284 (66.7%) males. Regarding specialities, 145 (34%) participants Human and Social Sciences - Languages, 93 (21.8) technical and economic sciences, while 188 (44.1%) in other specialities. Table and figure below show the joint frequency distribution between gender and specialities (Table 1).

Table 1

Participant demographics

Characteristics	*Participants (n=426)*	*Frequencies (%)*
Gender		
Male	284	66.7
Female	142	33.3
Specialities		
Human and Social Sciences – Languages	145	34.0
Technical and economic sciences	93	21.8
Other specialities	188	44.1

2.2 Instruments and procedure

The questionnaire was answered by 14 professors to measure the validity and reliability Coefficient. We found the Alpha Cronbach coefficient equals 0.96. The Intrinsic validity coefficient equals 0.97. This means that the questionnaire contains Intrinsic valid.

The questionnaire included 32 questions divided into four factors:

1. Factor 1: Professor information (04 questions)
2. Factor 2: Use of technology (09 questions)
3. Factor 3: Distance learning (09 questions)
4. Factor 4: Professor and student relationship (09 questions)

A five-point Likert Scale, with Strongly Agree (5), Agree (4), neutral (3), Disagree (2), and Strongly Disagree (1), has been used to measure attitude.

Table 2

The factors and items of the questionnaire

Factors	*Items*
Professor information	Sex
	Academic rank
	Speciality
	Experience
Use of technology	Use the computer and the Internet comfortably.
	I handle email with ease.
	Comfortably control the course publishing platform.
	It facilitates my work more and saves effort.
	I have all the necessary capabilities.
	I can reach my goals.
	I can develop myself and my abilities.
	The quality of the education that I offer is enhanced.
	I have the desire to teach with this technique.
Distance learning	It makes it easier for me to design the teaching content.
	The information arrives is better and clearer.
	It is easier for me to explain the lesson more.
	Facilitate the evaluation process.
	All lessons can be delivered.
	I can carry out supervised directed work and applied works.
	Technology is compatible with all teaching methods.
	Have a desire to develop my capabilities.
	The technology is compatible with all materials.
Professor and student relationship	I communicate better with my students.
	Good student participation.
	Facilitates the delivery of knowledge to the student.
	The student's understanding of the subject increases.

The student can access the material at any time.
The process eases student laziness.
Contributes to raising the quality of student formation.
Reduces many problems.
It is a temporary solution for any emergency or stop.

In addition, the study hypotheses are:

1. Algerian professors accept the method of the distance learning process during the quarantine period.
2. There is no difference in the attitude among professors by gender towards the use of distance learning during the home-quarantine period.
3. There is no difference between professors' attitudes according to their academic specialization.

2.3 Data analysis

The statistical analysis was performed using SPSS. Based on the Kolmogorov Smirnov test, the Shapiro-Wilk test, skewness and kurtosis, the normal distribution was checked. The skewness and kurtosis ranging within −1/+1 range, which means that the data follow a normal distribution (Table 3). Moreover, this is confirmed by the Kolmogorov-Smirnov test and Shapiro -Wilk test, where the P>0.05 (Table 3).

A Chi-square test, the mean, standard deviation, and the midrange was used to evaluate the nature of the attitudes of Algerian professors towards distance learning. Moreover, the T-test was used to determine the differences according to gender. In addition, ANOVA test was used to determine the differences according to speciality. The values obtained after the analysis were interpreted with the 0.05 significance level.

Table 3

Normality test

	Kolmogorov-Smirnov		*Shapiro-Wilk*		*Skewness*	*Kurtosis*
	Statistics	*P*	*Statistics*	*P*		
Gender						
Male	0.042	0.200	0.994	0.302	0.092	0.023
Female	0.050	0.200	0.993	0.737	0.019	0.007
Specialities						
Human and Social Sciences – Languages	0.051	0.200	0.991	0.443	0.118	0.128

Technical and economic sciences	0.068	0.200	0.984	0.311	0.190	0.596
Other specialities	0.057	0.200	0.991	0.304	0.053	0.353

3 Results

Algerian professors accept the method of the distance learning process during the quarantine period.

In this section, the Chi-square test was used to determine if there were significant differences between the expected and observed frequencies in all items. The results of the Chi-square test show the presence of statistical significance because the P value is less than 0.05. In addition, there is a difference between the opinions of the sample members in all the items of the questionnaire, which tends to the positive opinion (Table 4).

Table 4

Chi-square test

Factors	*Items*	χ^2	*P*
Factor 2: Use of technology	Use the computer and the Internet comfortably.	340.268	.00
	I handle email with ease.	456.300	.00
	Comfortably control the course publishing platform.	220.315	.00
	It facilitates my work more and saves effort.	153.836	.00
	I have all the necessary capabilities.	94.610	.00
	I can reach my goals.	108.695	.00
	I can develop myself and my abilities.	257.638	.00
	The quality of the education that I offer is enhanced.	129.516	.00
	I have the desire to teach with this technique.	108.624	.00
Factor 3: Distance learning	It makes it easier for me to design the teaching content.	331.793	.00
	The information arrives is better and clearer.	159.117	.00
	It is easier for me to explain the lesson more.	134.352	.00
	Facilitate the evaluation process.	149.352	.00
	All lessons can be delivered.	135.972	.00
	I can carry out supervised directed work and applied works.	124.587	.00
	Technology is compatible with all teaching methods.	137.333	.00
	Have a desire to develop my capabilities.	221.277	.00
	The technology is compatible with all materials.	128.695	.00

Factor 4: Professor	I communicate better with my students.	143.906	.00
	Good student participation.	215.362	.00
	Facilitates the delivery of knowledge to the student.	123.319	.00
	The student's understanding of the subject increases.	173.977	.00
	The student can access the material at any time.	315.995	.00
	The process eases student laziness.	96.723	.00
	Contributes to raising the quality of student formation.	94.141	.00
	Reduces many problems.	144.141	.00
	It is a temporary solution for any emergency or stop.	416.042	.00

To find out the nature of the trend, we calculated the mean and standard deviation of the sample responses. After that, we compared them with the midrange. If the mean value is greater than the midrange value, this indicates the positive trend and vice versa.

$$\text{midrange} = \frac{(\text{number of questions} * \text{max Score}) + (\text{number of questions} * \text{min score})}{2} \quad (1)$$

$$\text{total score midrange} = \frac{(27 * 5) + (27 * 1)}{2} = 81 \quad (2)$$

$$\text{Factor midrange} = \frac{(9 * 5) + (9 * 1)}{2} = 27 \quad (3)$$

The table below shows that the professors' attitudes are positive for the total score and the three factors because the mean value of the total score (88.27) and the mean value of each factor (33.18 - 27.3 - 27.74) were greater than the total score midrange (81) and factor midrange for the three factors (27). As for the standard deviation for the total score and the three factors are (19.4-6.9 - 7.33 - 6.8) respectively (Table 5).

Table 5

Mean and standard deviation

Factors	*Mean*	*SD*	*Min score*	*Max score*	*Sum of degrees*	*Trend*
Factor 2: Use of technology	33.18	6.9	09	27	14135	+
Factor 3: Distance learning	27.35	7.3	09	27	11652	+
Factor 4: Professor-student relationship	27.74	6.8	09	27	11818	+
Total score of the questionnaire	88.27	19.4	27	135	37605	+

There is no difference in the attitude among professors by gender towards the use of distance learning during the home-quarantine period.

We used a parametric test which is the T-test because the data follow the normal distribution. The T-test will be used to determine the differences according to gender.

Table 6 shows that the F value is not statistically significant, where the P=0.845. This last is greater than the level of significance α=0.05, which indicates the equal variance of the homogeneity of the two samples. This last signifies that the assumption of equal homogeneity was achieved. Thus, we note that the value of t is not statistically significant (P=0.596), which is greater than the significance level α=0.05, and therefore there are no statistically significant differences according to the gender variable.

Table 6

Result of t-Test

		Levene's Test for Equality of Variances		*T-test for Equality of Means*	
		F	*P*	*t*	*P*
Mean of factor 1	Equal variances assumed	.038	.845	.530	.596
	Equal variances not assumed			.535	.593
Mean of factor 2	Equal variances assumed	1.025	.312	.796	.427
	Equal variances not assumed			.779	.437
Mean of factor 3	Equal variances assumed	1.164	.281	.244	.807
	Equal variances not assumed			.237	.813
Mean of the 4 factors	Equal variances assumed	1.157	.283	.577	.564
	Equal variances not assumed			.563	.574

There is no difference between professors' attitudes according to their academic specialization.

In this section, we use the ANOVA test to determine the differences according to the speciality variable (Table 8). Table 7 shows that the Levene Statistic value is not statistically significant (P>0.05) and thus the homogeneity condition is achieved.

Table 7

Homogeneity of variances test

		Levene Statistic	*P*
Mean of the four factors	Based on Mean	.003	.997
	Based on Median	.011	.989
	Based on Median and with adjusted df	.011	.989
	Based on trimmed mean	.002	.998

Table 8 and Table 9 show that the value of F is not statistically significant (P>0.05). Therefore, there are no statistically significant differences attributable to the speciality variable.

Table 8

Result of the ANOVA test

	F	*P*
Mean of factor 2	.663	.516
Mean of factor 3	1.660	.191
Mean of factor 4	.492	.612
Mean of the three factors	.834	.435

Table 9

Robust test of equality of means

		F	*P*
Average 1st axis	Welch	.729	.484
Average 2nd axis	Welch	1.680	.189
Average 3rd axis	Welch	.495	.610
Total average	Welch	.824	.440

4 Discussion

The obtained results indicate that there are positive trends among university professors towards distance learning during the home-quarantine period (first factor: mean = 33.18 and standard deviation = 6.9) (Table 5). In addition, the trends were also positive in the second factor related to the distance education subject (mean = 27.3 and standard deviation = 7.33). The professors' attitudes were also positive regarding the axis of the professor-student relationship (mean = 27.74 and standard deviation = 6.8).

We considered positive trends in the previous factor because the mean value of each factor is greater than the reference value of midrange (27).

The overall degree of trends among the professors' responses was positive with mean = 88.27 and standard deviation = 19.4. The mean value is greater than the reference value of the total score midrange (81) (Table 5).

The obtained results confirm the findings of many previous research and studies, such as the studies by Al-Emran, Elsherif, and Shaalan (2016), Alwraikat and Al Tokhaim (2014), and Yuen and Ma (2008).

These positive trends towards distance education can be explained related to its many characteristics and advantages. Distance learning is a good alternative to the traditional system (Qing, Yi-Jing, Yu-Hang, & Min-Chen, 2020). Also, it facilitates the training and qualification process for the student.

Moreover, it has been adopted as a teaching method approved by the Algerian Ministry of Higher Education and Scientific Research through ministerial decision No. 633 dated August 26, 2020. This last specifies the exceptional provisions authorized in the field of organization, management, and evaluation of students during the COVID-19 period for the 2019-2020 academic year.

In the second hypothesis, a T-test was carried out to examine if there is any statistically significant difference between the professor' attitudes towards the use of distance education according to their gender. The finding did not indicate any significant differences among the professors in their attitudes in terms of their gender. The result of this research question could be attributed to the fact that female and male professors in Algeria are working together in this sector and both of them have enough technological background. Hence, no significant difference has been noticed. Similarly, Al-Emran, Elsherif, and Shaalan (2016) found that there is no statistically significant difference between the professor' attitudes towards the use of M-learning according to their gender. On the contrary, studies like Uzunboylu and Ozdamli (2011) and Alwraikat and Al Tokhaim (2014) indicated that there is a statistically significant difference among the professors' attitudes towards the use of M-learning according to their gender. Uzunboylu and Ozdamli (20110 indicated that male professors' attitudes were more positive towards M-learning than female professors. In addition, Alwraikat and Al Tokhaim (2014) found out that female professors' attitudes were more positive towards M-learning rather than male professors.

In the third hypothesis, an ANOVA test was carried out to examine if there is any statistically significant difference among the professor' attitudes towards the use of distance education according to their speciality. The obtained result did not indicate any significant differences among the professor in their attitudes in terms of their gender.

Finally, we conclude that Algerian universities were able to engage in the endeavour of distance learning, and this is to save the university season. In

addition, professors have an active role in this. The results of this study are the best evidence.

Conclusion

With the emergence of technology and the spread of the pandemic, it became necessary to rely on distance education. The main contribution of this study is to explore the attitudes of Algerian university professors towards distance education during the quarantine period, and its relationship to gender and speciality. Results indicate that there are positive trends among university professors towards distance learning during the home-quarantine period.

The finding indicated that professors' gender has positive attitudes towards distance learning with non-significant differences. This last means that distance learning can be adopted by both sexes without any additional special features. Moreover, the finding demonstrated positive attitudes towards distance learning with non-significant differences concerning their speciality. This last means that professors' speciality was not a hindrance in the distance learning process. Also, they do not need training.

In addition, after the quarantine is completely over and the pandemic continues, the Algerian University has adopted the hybrid system in education. This last combines the face-to-face education and distance education.

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Do Positivity and Sensitivity to Cyber-Bullying Decrease Cyber-Bullying?

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Abstract:

Introduction: The use of social media tools is increasing day by day. In addition to its positive use, social media tools are also used in the virtual environment to harm others. This harmful use is noted as cyber-bullying. Determining the factors affecting cyber-bullying is of great importance in terms of contributing to intervention studies. This study aims to examine the moderate role of positivity and sensitivity towards cyber-bullying between cyber-victimization and cyber-bullying.

Methods: The study was carried out with 342 university students, who approved voluntary participation in the process. The students who voluntarily participated in the research were 239 females (69.9%) and 103 males (30.1%), who were between 18 and 28 years old. In the data collection process, the revised cyber-bullying inventory, positivity scale, and personal information forms were used. In this research process, the moderating role of positivity and sensitivity (M) in the relationship between cyber-victimization (X) and cyber-bullying (Y) was investigated.

Results: As a result of the research, it was found that 35% of the participants were exposed to cyber-bullying and 1.4% were engaging in cyber-bullying. It was also found that there was a moderate positive relationship between cyber-victimization and cyber-bullying. In addition, the results showed that there is a negative relationship between positivity and sensitivity to cyber-bullying and cyber-victimization, and cyber-bullying. As a result of the analysis, it was observed that positivity and sensitivity affected the relationship between cyber-victimization and cyber-bullying. The results indicate that a decrease in positivity and sensitivity results in cyber-bullying behaviour, whereas an increase in positivity and sensitivity decreases cyber-bullying behavior.

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Discussion: The concept of positivity can be said to enable individuals exposed to cyber-bullying to create alternative emotions and create alternative strategies for the problem they are experiencing. In addition, the high level of positivity of the individual experiencing cyber-victimization can be thought to help develop and maintain friendship relations by improving their psychological resources. As a result, it can be stated that the probability of cyber-bullying decreases. In another result of the research, it has been revealed that the sensitivity between exposure to cyber-bullying and cyber-bullying has a moderating effect on cyber-bullying. When the sensitivity to cyber-bullying is low, it is observed that the effect of cyber-victimization on cyber-bullying is further increased. When there is a high sensitivity to cyberbullying, the impact of cyber-victimization on cyber-bullying is increasing very little and this effect is observed to be less powerful.
Limitations: The current study has also some limitations. First, the study was carried out as a cross-sectional study. A longitudinal study can be conducted to obtain more detailed results about the moderating effect. Second, positivity was used as an indicator of well-being. Therefore, it is essential to be careful while generalizing the results; different scales related to psychological well-being can be used. Third, the current study just used scales to evaluate the students' self-report; for this reason, the choice of mixed research approaches can offer a wide perspective by taking the opinions of different individuals such as friends and parents of individuals.
Conclusions: The findings provide evidence for reducing cyberbullying. In addition, the results provide useful information in the preparation of cyberbullying intervention programs.

Key words: cyber-victimization, cyber-bullying, positivity, sensitivity, moderating.

Introduction

Although the widespread use of Internet technology has positive effects in terms of banking, communication, and easy access to information, it also has negative effects, such as decreasing socialization by spending a lot of time on the Internet. It is stated that social media tools create new social environments (Juszczyk, 2015), are used for educational purposes (Torun, 2020) and are effective in providing psychological assistance (Madro, 2018). Accordingly, it can be said that the use of Internet technology in an unconscious, unlimited, and uncontrolled way causes individuals to be exposed Another synonym would be better.to the contents including physical, psychological, or sexual violence. This situation is conceptualized as cyberbullying in the relevant field.

Cyber-bullying is defined as repeated and deliberate aggression against individuals who cannot defend themselves online (Kowalski, Morgan, & Limber,

2012). In another definition, cyber-bullying is expressed as aggression aiming at harming a person or a group through repeated use of electronic devices on the victim, who has a power imbalance between the parties and cannot defend himself easily (Lacey, 2007; Smith et al., 2008). Based on the relevant definition, cyber-bullying has an intention to harm, power imbalance, and repetition between the parties (Kowalski et al., 2019).

Unlike traditional bullying, the fact that cyberbullying is anonymous and Internet technologies reach a wider audience by offering users a less limited space at all hours of the day increases the prevalence of cyber-bullying to a great extent (Sticca & Perren, 2013). Also, that participants are unaware of the consequences of cyber-bullying behaviour can be considered as the other important factor that facilitates cyber-bullying (Wong, Dillabaugh, Seddigh, & Nandy, 2017). When studies on the frequency and effect of cyber-bullying are examined, it is seen that most of them were about children and adolescents (Bussey, Luo, Fitzpatrick, & Allison, 2020; Chan & Wong, 2020; Extremera, Quintana-Orts, Lopez, & Rey, 2018; Ho & Warkentin, 2017; Steer, Betts, Baguley, & Binder, 2020).

In the developmental context, emerging adulthood, which is conceptualized by Arnett (2000) and includes both various opportunities and difficulties for individuals including the university period, necessitates some change and responsibility for university students. The fact that an individual has started college is separated from their parents and former environment and adapts to a new social environment poses an important source of risk for students (Kasikci, 2020; Stockdale & Coyne, 2020). University students can use social media extensively while adapting to a new social life (Ho & Warkentin, 2017; Quintana et al., 2019).

When the related literature is reviewed, it is seen that there are different results regarding the prevalence of cyber-bullying events among university students. In their study, Faucher, Jackson, and Cassidy (2014) found that 24% of college students were exposed to cyber-bullying, and 5% were cyberbullying. In a study conducted by Aricak et al. (2008), it was found that 19.7% of university students have been bullied at least once, and 54.4% of them were bullied at least once. Similarly, in a study conducted by Dilmac (2009) on university students, the prevalence of cyber-bullying and victimization were 22.5% and 55.3%, respectively.

Studies on university students have revealed the negative effects of exposure to cyber-bullying (Schenk & Fremouw, 2012). In this regard, it is seen that cyber-bullying correlates with academic success (Egeberg, Thorvaldsen, & Ronning, 2016; Torres, D'Alessio, & Stolzenberg, 2020), depression and anxiety (Faucher et al., 2014; Jenaro, Flores, & Frías, 2018), suicidal thoughts (Hinduja & Patchin, 2010; Jasso et al., 2018) and substance use (Goebert, Else, Matsu, Chung-Do, & Chang, 2011).

In terms of these results and the high prevalence of cyber-bullying among young people, it is significant to determine the factors that lead to an increase in cyber-bullying behaviours. Within this context, determining the factors that will contribute to the decrease in the impact or prevalence of cyber-bullying, which has serious negative consequences on the individual, is considered as an important situation. In this regard, it is considered that the effect of positivity and sensitivity on cyber-bullying behavior can be studied.

Positivity, which can be considered as an important protective factor in the decrease of cyber-bullying behaviours, is defined as a personality tendency that helps the individual to have a positive perspective in their lives (Caprara, Eisenberg, & Alessandri, 2017). In general, positivity is expressed as the constituent of self-confidence (Scheier & Carver, 1993) and the main determinant of well-being (Kozma, Stone, & Stones, 2000) considering individual differences. When studies on positivity are reviewed, it is seen that positivity is representative of phenomena such as self-esteem, optimism and life satisfaction (Caprara et al., 2012). It was also determined that positivity is associated with positive emotions (Fredrickson, 2001), happiness (Lyubomirsky, 2001), optimism (Peterson, 2000), intrinsic motivation (Ryan & Deci, 2000), attachment (Ryan & Lynch, 1989) and academic motivation (Pajares & Schunk, 2001). At this point it is thought that examining the role of positivity in the relationship between cyber-victimization and cyber-bullying, which can help individuals to cope with adverse living conditions, will contribute significantly to the emerging literature about cyber-bullying.

1 Literature review

1.1 Cyber-victimization as a predictor of cyber-bullying

When the literature is reviewed, it is seen that those, who are exposed to cyber-bullying, exhibit cyber-bullying behaviour. In addition, exposure to cyber-bullying is considered as an important source of risk; individuals, who are exposed to cyberbullying, are cyber-bullying others. (König, Gollwitzer, & Steffgen, 2010; Hsieh, 2020). In other words, cyber victimization is shown as the strongest predictor of getting involved in cyber-bullying (Hood & Duffy, 2018; Kokkinos, Antoniadou, Asdre, & Voulgaridou, 2016; Livazović & Ham, 2019). When studies on the relationship between cyber-bullying and cyber-victimization are focused, it is observed that there are moderate and significant relationships between these two variables (Baldry, Sorrentino, & Farrington, 2019; Fanti, Demetriou, & Hawa, 2012; Kokkinos, Antoniadou, & Markos, 2019). Also, in the related literature, adolescents, who have been exposed to traditional bullying, are more likely to engage in cyber-bullying than those not exposed, and it is evaluated that, in this case, anger is used as an online bullying tool (Aricak & Ozbay, 2016; Jang, Song, & Kim, 2014).

1.2 Positivity and cyber-bullying

One of the frequently studied areas of positive psychology is the concept of "positivity." According to Caprara et al. (2009), positivity is expressed as one of the main components of self-esteem, optimism, and life satisfaction, which are correlated with each other. Positivity is defined as having a positive orientation towards the individual himself, his future, and his past lives, or a positive assessment of these processes (Caprara et al., 2010).

Generally, the findings of relevant studies about positivity show that high self-esteem prevents the bullying behaviours, which has a negative relationship between self-esteem and cyber-bullying, both of which are the main components of positivity (Varghese & Pistole, 2017). In addition, when examining the relationship between life satisfaction and cyber-bullying, which is another key component of positivity, it is observed that both cyber-victimization and cyber-bullying behavior have a negative impact on individuals' life satisfaction. For example, Leung, Wong and Farver (2018) found a negative correlation between exposure to cyber-bullying, cyber-bullying, and life satisfaction. Finally, when the relationship between optimism, which is one of the basic components of positivity, and cyber-bullying is examined, it is concluded that exposure to cyberbullying effects optimism negatively (Navarro, Ruiz-Oliva, Larrañaga, & Yubero, 2015; Snyman & Loh, 2015).

As a result, it can be said that cyber-bullying behaviours, which continue to be widespread, have negative effects on emotional, cognitive, and social aspects. Reducing risky behaviours by using strong structures in the individual instead of the treatment-oriented perspective of the positive psychology approach makes this situation more meaningful. One of these powerful structures is positivity. Having both cognitive and emotional size of positivity can be considered an important factor in the individual feeling strong. In the positive psychology approach, the development of positivity can be evaluated within the scope of the theory of expansion and development of positive emotions (expansion effect, construction effect and distortion effect) (Fredricson, 2001). It can be said that individuals experiencing positive emotions can build social (maintaining relationships and creating new ones) and psychological (optimism, psychological resilience, self-esteem) resources. In other words, the positivity of individuals can be an important factor in ensuring the psychological adjustment of the individual as a protective factor. On the contrary, a negative and stressful experience such as cyber-victimization may create a deterioration effect and cause individuals to engage in cyber-bullying.

1.3 Sensitivity to cyber-bullying and cyber-bullying

Sensitivity is defined as the systematic defence of the individual against any perceived threat and thus protecting himself from possible damages (Neff, 2003). Similarly, awareness is expressed as an awareness-based structure developed to deal with an anxiety-inducing stimulus (Raffone, Tagini, & Srinivasan, 2010).

It is stated that people with high sensitivity of cyber-bullying, which is associated with undesirable conditions such as depression and anxiety (Faucher et al., 2014), suicidal thoughts (Bauman, 2013; Brailovskaia et al., 2018; Hinduja & Patchin, 2010), substance use (Mitchell et al., 2007), avoid risky activities, such as mocking in the virtual environment, sharing personal information electronically, sending unauthorized photographs, disturbing people via messages or meeting strangers, which are among the typical behaviours of cyber-bullying (Berson & Berson, 2005; Subrahmanyam & Greenfield, 2008). In addition to this situation, it is stated that people with a high level of sensitivity to cyber-bullying pay attention to principles of online privacy and convey negative situations they encounter on the virtual environment to authorized people (Balakrishnan, 2018). It is thought that in case of high sensitivity based on these findings, it can be considered an important protective factor about the negative effects of cyber-bullying, thus contributing to the development and implementation of preventive and precautionary intervention approaches.

In conclusion, the purpose of this study is to examine the moderating role of positivity and sensitivity to cyber-bullying in the relationship between cyber-victimization and cyber-bullying. For this general purpose, the following hypotheses guided the current study:

1. There would be a significant relationship between cyber-victimization and cyber-bullying.
2. When the positivity is low, the effect of cyber-victimization on cyber-bullying would be stronger.
3. When the sensitivity to cyber-bullying is low, the impact of cyber-victimization on cyber-bullying would be stronger.

2 Method

This research, which aims to determine the relationship between experiencing cyber victimization and cyberbullying behavior of university students, is a relational research model. This model is a method used to reveal the level of influence of variables used in research (Creswell, 2011).

2.1 Participants

The research sample at Erzurum Ataturk University in Turkey in 2020, Kazim Karabekir Faculty of Education is composed of students from different programs, 342 university students were reached with the appropriate sampling

method. The students who voluntarily participated in the research were 239 females (69.9%) and 103 males (30.1%), who were between 18 and 28 years old. It is noteworthy that the majority of the students in the research sample are women. In the sample of the study, it is observed that there are more students between the ages of 19-21. The participants are studying in the faculty of education and consist of guidance and psychological counseling, pre-school, special education, and social studies teaching in terms of the department. Descriptive statistics regarding the demographic data of the participants are given in Table 1.

Table 1

Information on the individuals participating in the study

Gender	*N*	*%*
Female	239	69.9
Male	103	30,1
Grade	*N*	*%*
1	95	27.8
2	83	24.3
3	77	22.5
4	87	25.4
Age	*N*	*%*
18	36	10.5
19	63	18.4
20	87	25.4
21	83	24.3
22	54	15.8
23	10	2.9
24	3	.9
26	4	1.2
28	2	.6
Program	*N*	*%*
Guidance and Psychological Counseling	95	27.8
Pre-School Teaching	87	25.4
Special Education Teaching	77	22.5
Social Studies Teacher	83	24.3
Total	342	100

2.2 Data collection tools

In the data collection process, the revised cyberbullying inventory, positivity scale, and personal information forms were used.

Revised Cyber-Bullying Inventory
The cyber-bullying inventory developed by Erdur-Baker and Kasvut (2007) was revised by Topcu and Erdur-Baker (2010) to measure the cyberbullying and cyber victimization behaviours of adults. The revised cyber-bullying inventory consists of two parallel forms, cyber-bully, and cyber-victim. As part of the scale's reliability, Cronbach alpha was calculated and the Cronbach alpha coefficient of cyber-bully and cyber-victim forms was found to be .82 and .75, respectively. As part of this study, the Cronbach alpha of the scale was recalculated and detected as .75 for cyber-bullying and .82 for cyber victimization.

Positivity Scale
The studies of adaptation of the positivity scale, which was developed by Caprara et al. (2012) to determine the positivity levels of adults, to Turkish culture, were conducted by Cikrikci, Ciftci, and Gencdogan (2015). The scale based on self-report and 4-point Likert type consists of 8 items and one dimension in total. Cronbach alpha was calculated within the scope of the reliability of the scale, and it was found to be .73. Within the scope of this research, the Cronbach alpha coefficient of the scale was recalculated, and it was found to be .83.

Cyber-Bullying Sensitivity Scale
The scale consists of 13 items and one dimension developed by Uysal, Duman, Yazici, and Sahin (2014) to measure the sensitivity of teacher candidates to cyberbullying. The high scores obtained from the scale are evaluated as the sensitivity to cyberbullying behaviour of individuals. Cronbach's alpha coefficient of the scale was found to be .78. Within the scope of this study, the internal consistency and Cronbach alpha coefficient of the scale was determined as .84.

2.3 Data analysis
In this research process, the moderating role of positivity (M) in the relationship between cyber victimization (X) and cyberbullying (Y) was investigated. Within the scope of the research, ethics committee approval was first received on 14.02.2020 and data were collected by researchers entering the classrooms. It was emphasized that participation in the data collection process was voluntary, and the data collection process was completed within a week. First of all, lost data analysis was conducted to examine the collected data, in terms of suitability for parametric tests. In this context, extreme value analyses (kurtosis, skewness, Z score, Mahalanobis, Cooks, Leverage) were performed.

After the data obtained in the first stage of the data analysis showed a normal distribution, in other words, after determining the suitability of the parametric tests, descriptive and relational values between the variables were revealed and the moderating role of positivity and sensitivity to cyber-bullying in the relationship between cyber-victimization and cyber-bullying was investigated. In this context, a regression-based moderating analysis proposed by Hayes (2009) was conducted. To support the research hypothesis, the values within the 95% confidence interval (Confidence Interval, CI) obtained as a result of the analysis should not have included the zero value (MacKinnon, Lockwood, & Williams, 2004). Moderating analyses were carried out using the PROCESS macro. In addition, the SPSS-22 program was used to determine the relationship among variables in the study.

3 Results

3.1 The relationship between variables and descriptive findings

In the study, the coefficients of flatness and skewness were examined before the analysis processes. It was observed that the kurtosis skewness values were between the -2 +2 criteria as proposed by Finney and DiStefano (2006) for normality assumption and all variables had a normal distribution. After the normality assumption of the research data was met, the relationship between the variables was examined. As part of the research hypothesis, the relationships between cyber-victimization, cyber-bullying, positivity, and sensitivity to cyber-bullying, and the variables involved were given in Table 2.

Table 2

Statements and relational consequences for variables related to cyber-bullying, positivity, and sensitivity to cyber-bullying

	Cyber-victimization	*Cyber-bullying*	*Positivity*	*Sensitivity to cyber-bullying*
Cyber-victimization	1			
Cyber-bullying	.49*	1		
Positivity	-.10*	10*	1	
Sensitivity to Cyber-bullying	.08*	-.09*	.07*	1
$\bar{X}$	15.47	16.96	27.02	31.95
S.s	4.69	4.05	4.90	4.99

*p<.05

When Table 1 is examined, it is found that r(342)=.49 between cyber-victimization and cyber-bullying, r(342)=-10 between positivity and r(342)=10 between cyber-bullying and positivity. Also, it was determined r(342)=.08

between cyber-victimization and sensitivity to cyber-bullying and r(342)=-.09 between cyber-bullying and sensitivity to cyber-bullying.

3.2 Moderating role

3.2.1 The moderating role of positivity

Slope analysis proposed by Aiken and West (1991) was conducted and given in Figure 1 to determine how the impact of cyber-victimization on cyber-bullying varies according to different levels of positivity.

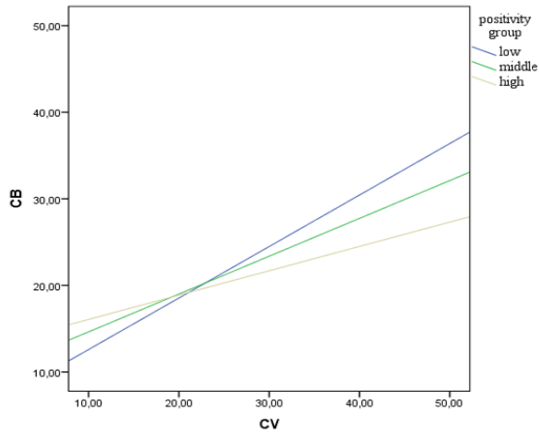

Figure 1. Graphical representation of the moderate effect of positivity.

When Figure 1 is examined, the effect of cyber-victimization on cyber-bullying increases when positivity is low (β=.52, 95% BCA CI [.4145, .6301]). In addition, when the positivity is high (β=.36, 95% BCA CI [.2546, .4677]), the impact of cyber-victimization on cyber-bullying increases; however, it is seen that this effect appears to be less powerful. At this point, it can be said that cyber-bullying behaviors will decrease when the positivity is high.

3.2.2 The moderating role of sensitivity to cyber-bullying

Slope analysis proposed by Aiken and West (1991) was conducted and given in Figure 2 to determine how the impact of cyber-victimization on cyber-bullying varies according to the sensitivity levels of cyber-bullying.

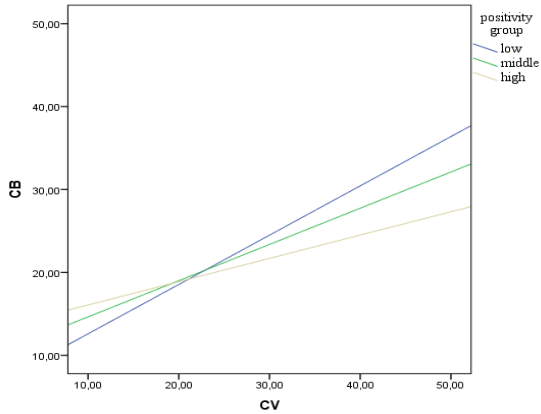

Figure 2. Graphical representation of the moderate effect of sensitivity.

When Figure 2 is examined, the effect of cyber-victimization on cyber-bullying increases when sensitivity to cyber-bullying is low (β=.58, 95% BCA CI [.4622, .7025]. In addition, when the sensitivity to cyber-bullying is high (β=.30, 95% BCA CI [.2022, .4114], the impact of cyber- victimization on cyber-bullying increases; however, it is seen that this effect appears to be less powerful. In this context, it can be said that cyber-bullying behaviors will decrease when the sensitivity to cyber-bullying is high.

4 Discussion

4.1 Cyber-victimization as a predictor of cyber-bullying

As a result of the research, it was found that 35% of the participants were exposed to cyber-bullying and 1.4% were doing cyber-bullying. When the literature is examined, it is striking that there are different findings on cyber-bullying among university students. For example, Balakrishnan (2017) found that 35% of young adults were cyber-bullying, while 44% experienced cyber-victimization. Kokkinos et al. (2014) reported that the proportion of cyberbullies among university students in Greece was 14% and cyber-victims were 11%. Schenk and others (2013) found that 7.5% of American college students were cyber-bullying and 2.4% were cyber-bullying victims. Musharraf and Anis-ul-Haque (2018) found that 25% of university students experience cyber-victimization and 4% were cyber-bullying.

4.2 Positivity and cyber-bullying

In another result obtained in the study, it was determined that there was a moderate, positive and significant relationship between cyber-victimization and

cyber-bullying (r=.49). Current research has shown that one of the predictors of cyber-bullying behavior is experience cyber-bullying (Ak, Özdemir, & Kuzucu, 2015; Kowalski et al., 2014; Leung, Wong, & Farver, 2018; Riebel, Jäger, & Fischer, 2009; Quintana-Orts & Rey, 2018). Numerous studies in different countries show strong correlations between cyber-victimization and bullying (r=.50 to60) reported (Mishna, Khoury-Kassabri, Gadalla, & Daciuk, 2012; Wong, Chan, & Cheng, 2014). In a similar study, Leung, Wong, and Farver (2018) found a moderate correlation between exposure to cyber-bullying and doing cyber-bullying (r=65).

In another result of the study, it is seen that positivity is significant in the relationship between cyber-victimization and cyber-bullying. When the positivity is low, the effect of cyber-victimization on cyber-bullying is observed to increase even more. When positivity is high, the effect of cyber-victimization on cyber-bullying increases very little and this effect is observed to be less powerful. In other words, high positivity reduces cyber-bullying of those who are exposed to cyber-bullying.

In the positive psychology approach, individuals' positive emotion creates both alternative strategies and personal resources. According to positive psychology, the individual has intellectual, physical, psychological, and social resources. As these resources continue to be built, the individual has more positive emotions (Diner, 2003; Fredrickson, 2001). In this context, the concept of positivity can be said to enable individuals exposed to cyber-bullying to create alternative emotions and create alternative strategies for the problem they are experiencing. In addition, the high level of positivity of the individual experiencing cyber-victimization can be thought to help develop and maintain friendship relations by improving their psychological resources. As a result, it can be stated that the probability of cyber-bullying decreases.

Fredrickson (2009) states that positive emotions will deteriorate when the individual encounters a stressful experience. This situation is stated as the "distortion effect". In this context, as a result of the individual's stressful experience such as cyber-victimization, it can be thought that the level of positivity decreases and deteriorates, and as a result, the behaviour of cyber-bullying increases.

Positivity includes concepts such as life satisfaction, self-esteem, and optimism (Caprara et al., 2012). Life satisfaction, which is one of the components of positivity, expresses a general cognitive assessment and reaction regarding the quality of life (Varela, Guzman, Alfaro, & Reyes, 2019). It is stated that cyber-bullying will negatively affect life satisfaction (Valois, Kerr, & Huebner, 2012). Therefore, this result of the study is consistent with studies showing that the life satisfaction of those who exposed to cyber-bullying has decreased (Moore, Huebner, Hills, 2012; Varela et al., 2019). Navarro and others (2015) found that

those experiencing cyber-victimization reported lower life saturation than students who were not involved in this behaviour.

It can be said that cyber-bullying behaviours emerge more strongly with the decrease in the life satisfaction of individuals exposed to cyber-bullying. As a matter of fact, the idea that a decrease in the life satisfaction in previous studies will lead to cyber-bullying behavior, supports the result of this study (Moore et al., 2011; Ortega et al., 2012). Buelga, Musitu, Murgui and Pons (2008) note that reduced life satisfaction leads to aggressive behaviour. This is consistent with the results of the study. Individuals exposed to cyber-bullying experience emotional consequences such as anger, frustration and sadness (Hinduja & Patchin, 2007). From there, the individual's exposure to cyber-bullying can lead to intense emotional reactions, reduced life inspiration, and cyber-bullying behaviour.

It is stated that individuals with high life satisfaction have high self-esteem, self-control level, hope, self-efficacy, and high skills in interpersonal communication (Suldo & Huebner, 2006). Therefore, the high satisfaction level of individuals exposed to cyber-bullying can indirectly increase positivity and can be considered as a protective factor for cyber-bullying behaviours.

Searches show that self-esteem, one of the components of positivity, decreases on individuals who exposed to cyberbullying (Cenat et al., 2014; Chang et al., 2013; Katzer, Fetchenhauer, & Belschak, 2009). Previous studies have found that low self-esteem is a factor for cyberbullying (Brewer & Kerslake, 2015; Betts, Houston, & Steer, 2015; Ding, Wang, & Liu, 2018). This result is consistent with previous studies that have shown cyber-bullying increases with the decline of self-esteem, which is a component of positivity in cyber-victims (Hinduja & Patchin, 2010).

It is accepted that self-esteem has a positive effect on the mental health of individuals (Orth, Robins, Widaman, & Conger, 2014). Individuals with high self-esteem may exhibit features such as living a happy and satisfied life, valuing themselves, loving themselves and other people. When they are exposed to cyber-bullying as a result of showing these features, they may consider the way to overcome this problem instead of taking revenge from others, showing anger reactions, and making false evaluations. The thought of solving this problem when exposed to cyber-bullying can lead to non-cyber bullying. Therefore, it can be said that while individuals' low self-esteem increases their cyberbullying behaviour, on the other hand, individuals who have high self-esteem decreases their possibility of doing cyber-bullying.

Optimism, which is another component of positivity, is defined as the individual's expectation of a positive result related to an event. However, it is stated that optimism helps the individual to develop coping skills with stressful events (Carver, Scheier, & Segerstrom, 2010). Navarro and others (2015) revealed that those exposed to cyber-bullying experience less optimism,

happiness, and life satisfaction. It can be stated that individuals with optimism features of positivity will be more flexible and less negatively affected by this situation when they faced with cyber-bullying. As a matter of fact, Snyman and Loh (2015) show that there is a negative relationship between optimism and cyber-bullying, it is consistent with the research result. As a result, it can be said that even if individuals showing the optimism characteristics of positivity are exposed to cyber-bullying, they are less affected by this situation and tend to provide satisfaction from their lives.

4.3 Sensitivity to cyber-bullying and cyber-bullying

In another result of the research, it has been revealed that the sensitivity between exposure to cyber-bullying and cyber-bullying has a moderating effect on cyber-bullying. When the sensitivity to cyberbullying is low, it is observed that the effect of cyber-victimization on cyber-bullying is further increased. When there is a high sensitivity to cyber-bullying, the impact of cyber victimization on cyber-bullying is increasing very little and this effect is observed to be less powerful. This finding means that the relationship between cyber victimization and cyber-bullying is moderating by sensitivity to cyber-bullying. Igdeli (2018), Kanbul and Ozansoy (2019) indicate that cyber-bullying decreases as the sensitivity towards cyber-bullying increases, and this result supports this research. Williams and Guerra (2007) reported that individuals' thinking that bullying is morally unacceptable prevents both exposure to cyber-bullying and doing cyber-bullying.

Conclusion, limitations, and recommendations for future studies

This study showed that positivity and sensitivity to cyber-bullying have a moderating impact on the increase and decrease of cyber-bullying behaviour. The results of the research reveal important findings in order to better understand the causes of cyber-bullying behaviour. However, the current study has also some limitations. First, the study was carried out as cross-sectional study. A longitudinal study can be conducted to obtain more detailed results about the moderating effect. Second, positivity was used as an indicator of well-being. Therefore, it is essential to be careful while generalizing the results; different scales related to psychological well-being can be used. Third, the current study just used scales to evaluate the students' self-report; for this reason, the choice of mixed research approaches can offer a wide perspective by taking the opinions of different individuals such as friends and parents of individuals. Another limitation is that the data were collected from only students studying at a Turkish university; therefore, different contexts and cultures can also be included with similar studies.

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Same Mathematical Structure, Different Design: How Does Task Format Affect Creative Problem-Posing Performance?

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Abstract:

Introduction: The purpose of the study was to investigate the effect of task format on pre-service mathematics teachers' creative problem-posing performance.

Methods: In this quantitative study, a figural and a written pattern related to daily life with the same mathematical structure were presented to participants and they were asked to write as many problems as they could. The problems were analyzed based on whether they were viable and then on the components of fluency, flexibility, and originality of creativity.

Results: The results of the study indicated that, although the flexibility and originality scores in the figural pattern were higher, the only statistical difference was observed in the originality component. Moreover, it has been found that some of the participants wrote similar problems in both tasks; however, the problems in the figural pattern were inclined to be more difficult.

Discussion: Developing students' creative-thinking skills is a main purpose of mathematics education research (Mann, 2006). However, the results of the research have indicated that the teachers' knowledge of how to develop students' creative-thinking skills is still lacking (Shriki & Lavy, 2012) and, consequently, students are provided with few opportunities to experience creative thinking and learning in class (Silver, 1997; Sriraman, 2005). Problem posing has a close association with creativity as well as with problem solving (Haylock, 1997; Silver, 1997). Therefore, to develop creative-thinking skills, learning environments should be enriched with problem-posing tasks. The results of this research do not assert that only one of the figural or written pattern types must be preferred to stimulate creative-thinking skills in the context of problem posing.

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Instead, the results emphasize that each of the written and figural patterns has its own strengths.
Limitations: The fluency, flexibility, and originality scores are affected by the sample size. Conducting similar studies on larger samples may provide more valid conclusions about possible differences. This study has taken two different task formats into account as follow; being in written form related to daily life or including figural patterns. Figural patterns can also be structured based on whether they explicitly provide the pattern rule (Barbosa & Vale, 2016). The effect of these types of problem-posing tasks on creativity components is another case that can be investigated.
Conclusions: Considering these results together, while including problem-posing tasks for both written and figural patterns to improve the flexibility and originality components of creativity is supported, the use of problem-posing tasks for figural patterns may be further recommended.

Key words: problem posing, creativity, task presentation, pattern, pre-service mathematics teachers.

Introduction

In several countries, recommendations for the reform of school mathematics have suggested an important role for problem posing (Silver, 2013). For example, the National Council of Teachers of Mathematics (NCTM, 2000) suggested that teachers should "ask students to formulate interesting problems based on a wide variety of situations, both within and outside mathematics" (p. 257). Kilpatrick (1987) emphasized the importance of problem posing by stating that "problem formulating should be viewed not only as a goal of instruction but also as a means of instruction" (p. 123). One of the main reasons for the importance attributed to problem posing is its relationship with creative thinking skills (Harpen & Sriraman, 2013; Haylock, 1997; Leung, 1997). Creativity that is seen as synonymous with divergent thinking (Cropley, 2006) is the ability to generate information or ideas from given information or ideas, where the emphasis is on the quantity and quality of the outputs (Balka, 1974). Problem posing is an open-ended activity (Silver, 1995). Therefore, participants will be able to write a wide variety of problems based on their knowledge and experience. Since these problems will provide insight into their divergent thinking skills, problem posing can be seen as an assessment tool in determining creative thinking skills (Leung, 1997).

Cai, Hwang, Jiang, and Silber (2015) have suggested a series of research problems to be answered through problem posing. One of these problems is the following: "How do different characteristics of problem situations affect

subjects' problem posing?" (pp. 9-10). The limited number of studies conducted in this context indicated that the presentation of the problem-posing tasks in visual and written (Işık & Kar, 2011; Chapman, 2012), free and structured (Silber & Cai, 2017), or with and without quantitative data (Leung & Silver, 1997) formats affects the participants' problem-posing performance (writing mathematically valid or arithmetically and semantically complex problems). This research aims to take the contributions of these studies one step further and thus examines the effect of the task format on creative problem-posing performance. More specifically, pre-service mathematics teachers were asked to write problems on patterns with the same mathematical structure (i.e. a growing pattern that grows by a fixed number) but presented in different formats, and their problems were compared on the fluency, flexibility, and originality dimensions of creativity.

The results of this study may offer some contribution to mathematics education research. First, we still have an inadequate understanding of what tasks develop creativity thinking, how they contribute to creative thinking ability, how they can be integrated into learning environments, and how the outcomes of these tasks can be judged (Novotná, Verbovanec, & Török, 2013; Shriki, 2010; Silver 1994; Singer & Voica, 2017). Thus, the results of this study can shed light on the choice of tasks to be used in research aiming at developing creativity thinking skills. Second, differences can be seen in the participants' fluency, flexibility, or originality scores due to the problem-posing task format. Thus, determining how the problem-posing task format affects these components may contribute to a more careful evaluation of the participants' creative problem-posing performance. Last, since problem posing generates more diverse and flexible thinking and encourages children to take greater responsibility for their learning, students will gain various benefits from problem posing (English, 1997). In addition, as many researchers (Crespo & Sinclair, 2008; Lee, Capraro, & Capraro, 2018; Stickles, 2011) emphasize, teachers' competency and knowledge in using and teaching problem posing are affective on students' problem-posing ability. Therefore, in-/pre-service mathematics teachers should be able to demonstrate these skills to develop students' creative problem-posing skills. Given this, the results of this study will also be able to give an idea about the ability of their creative problem-posing performance.

1 Theoretical framework

1.1 Creativity and problem posing

Creativity is highlighted as a basic ability in mathematics documents (e.g. NCTM, 2000) that needs to be developed in students. Creativity is associated with mathematical thinking (Singer, Pelczer, & Voica, 2011) and problem posing and solving (Leung, 1997; Silver, 1997) and offers opportunities to develop

students' mathematical understanding (Mann, 2006; Shriki, 2010). Due to its complex nature, creativity has been defined, characterized, and interpreted in various ways based on researchers' points of view (Ayllon, Gomez, & Balleste-Claver, 2016; Treffinger, Young, Selby, & Shepardson, 2002). For instance, creativity is the ability to engage with given material and produce new ideas, where the quality and quantity of the outputs are emphasized (Balka, 1974). As Vale, Pimentel, and Barbosa (2018) found, creativity involves abilities such as challenging assumptions, breaking boundaries, recognizing patterns, seeing things in new ways, imagining, communicating, and solving and inventing problems. In these and other definitions and explanations of creativity, the most common feature that researchers point out is producing something new.

At the beginning of the twentieth century, creativity was considered, with a narrow perception, as a common characteristic feature of geniuses who revolutionized their fields. Over the course of time, such thinking started to shift. Contemporary approaches define creativity as the tendency of creative thinking and behaving, a perspective that provides stronger bases for educational applications (Silver, 1997). On this basis, attention is drawn to the difference between professional-level and school-level creativity. Sriraman (2005) stated that students are not expected to bring innovations in the field of mathematics as mathematicians did, but they are able to offer a new perspective of interpretation or solution to a math problem. Similarly, Leikin (2011) associated creative thinking at the school level with finding different solutions and ideas, establishing various mathematical connections, applying different techniques, and original thinking.

When the explanations of creativity are examined, students are asked to produce various ideas and solutions. Therefore, activities that support creative thinking skills should enable different solutions or explanations. Accordingly, open-ended mathematical tasks are widely used in the determination and development of creative thinking skills, as this allows the production of many solutions or answers (Chamberlin & Moon, 2005; Know, Park, & Park, 2006; Silver, 1994; Vale et al., 2018). Problem posing is seen as an open-ended task (Haylock, 1997; Pehkonen, 1995) and is accepted as an important didactic tool in measuring and fostering mathematical creativity (Cai et al., 2015; Moore-Russo & Demler, 2018). As Leung (1997) pointed out, "given the 'creating a problem' characteristic of problem posing and the 'bring into something new' nature of creativity one might see problem posing as a kind of creativity" (p. 81). In this study, the problem-posing definition made by Stoyanova and Ellerton (1996) was adopted because pre-service mathematics teachers were asked to write problems based on their knowledge and experience. This definition is as follows: "Problem posing will be defined as the process by which, on the basis of

mathematical experience, students construct personal interpretations of concrete situations and formulate them as meaningful mathematical problems." (p. 518)
The three primary criteria used in judging creative productions in problem-solving and -posing tasks are fluency, flexibility, and originality (Guilford, 1950; Torrance, 1988). First, fluency represents the number of solutions in a problem-solving context while representing the number of problems in a problem-posing context. Second, flexibility refers to the total number of different productions (different solution strategies or problems with different mathematical structures) produced in problem-solving or problem-posing tasks. Vale et al. (2018) indicated that fluency skill is very important because the first step to problem solving or generating anything creative is having as many ideas as possible to choose from. Balka (1974) found that a high fluency score does not obviously indicate a high creative ability; however, a high fluency score accompanied by a high flexibility score may give a better indication of creative ability in mathematics. Last, the recognition of originality is decisive in determining creativity (Carreira & Amaral, 2018). For example, Vale, Pimentel, Cabrita, Barbosa, and Fonseca (2012) have identified originality as the ability to think in an unusual way and as associated with the uniqueness of the ideas. Thus, originality is the ability to create fresh, unique, unusual, totally new, or extremely different ideas or products. In this respect, originality is seen as the pinnacle of creativity (Vale et al., 2018). Conversely, some other researchers have considered originality as a feature of the sample and identified it as the rareness of the responses given in the sample. This definition also provides an opportunity for statistical analysis. For example, Leikin (2009) accepted problems posed by less than 15% of participants as original. However, many other researchers accepted problems posed by less than 10% of participants as original (Kar, Özdemir, Öçal, Güler, & İpek, 2019; Harpen & Sriraman, 2013; Yuan & Sriraman, 2010). In such circumstances, the posed problems considered original do not have to be mathematically complex. In this study, in order to make statistical comparisons, the originality component was used in the sense of the rareness of the responses, and the lower 10% level was embraced as a criterion.

1.2 Task formats and problem-posing performance

Researchers have used many different types of problem situations to investigate problem posing, ranging from simply deleting a question statement from a textbook problem to more open-ended problem situations (Cai et al., 2015). Research using different problem-posing tasks indicates that there are various factors that affect problem-posing performance. One such factor is task format. Different meanings are attributed to the task format. For example, some research examines the impact of the task directive on problem-posing performance (Chen,

Van Dooren, Chen, & Verschaffel, 2007; Ellerton, 1986; Lowrie & Whitland, 2000). In such studies, the participants are asked to pose problems for their friends, generate simple, medium, and difficult problems, and pose problems for students from different grade levels. For example, Ellerton (1986) explained that the directive "pose a difficult problem for your friends" was intended to help the students project their thinking beyond themselves and, thus, affect their problem-posing performance. Lowrie and Whitland (2000) asked third-grade students to pose problems for second- and fourth-grade students. As expected, students posed arithmetically more complex problems for fourth-grade students.

One of the basic elements of problem posing is the understanding of the task's mathematical structure (Brown & Walter, 2005). Freudenthal (1991) defined that "structure is a form abstracted from its linguistic expression" (p. 20). Participants who pose problems should be able to understand the mathematical structure of the tasks and use these structures for the problems they will pose. The complexity of the mathematical structure is a factor affecting problem-posing performance (Leung & Silver, 1997; Stickles, 2011). In her study aiming to investigate pre- and in-service mathematics teachers' problem-posing performances based on a given problem, Stickles (2011) indicated that the complexity of the data used in the task has an effect on problem-posing performance.

Stoyanova and Ellerton (1996) classified problem-posing tasks as structured, semi-structured, and free situations. Some research studies point out that these types of situations are another factor affecting participants' performance in writing mathematically valid problems (Christou, Mousoulides, Pittalis, Pitta-Pantazi, & Sriraman, 2005; Silber & Cai, 2017). For example, Silber and Cai (2017) found that pre-service mathematics teachers posed more semantically complex problems in structured problem-posing tasks (e.g. "in the Road-Trip Open-Ended Task, pose a problem that has '1130 miles' as the answer") compared to those posed in free tasks (e.g. "pose a problem based on the Road-Trip Open-Ended Task") aimed at measuring the same ability. The researchers conjectured that the main reason for this difference was the mathematical relations were considered more thoroughly in the structured task.

Each type of representation gives an opportunity to look at the relationship between the data from a different perspective (Ainsworth, 2006; Knuth, 2000). Problem-posing tasks can also be designed to include different representation types (Cai, Jiang, Hwang, Nie, & Hu, 2016), and this has been found to affect participants' problem-posing performance (e.g. Işık & Kar, 2011; Cai et al., 2013; Chapman, 2012). In this regard, problem-posing tasks can be presented in a way that they are related to daily life or involve a figure, graphic, or table. There are different views regarding the effect of such task formats, which are also taken into consideration in this study, on problem-posing performance.

Knuth (2000) indicated that graphics provide direct information by presenting infinitely many points while symbolic representations do this indirectly. Accordingly, problem-posing performance would be expected to be higher in tasks involving these types of representations. For example, Cai et al. (2013) found that eleventh-grade students had more difficulty with problem posing for an equation system with two unknowns compared to a linear graph with one unknown. In another study, Işık and Kar (2011) reported that pre-service mathematics teachers showed a lower performance in problem posing through visual representations compared to open-ended written stories having the same mathematical structure. They hypothesized as the main reason for this situation that the interpretation of visual representations would require higher-level cognitive skills. Chapman (2012), conversely, presented the picture task, one of several different problem-posing tasks, to a similar sample (a picture reflecting the comparison meaning of the subtraction operation). However, in the posed problems, the focus of the participants' interpretations was more on the meaning of pairing. Chapman (2012) indicated that they focused more on the picture's context instead of on its purpose when posing problems. Similarly, while emphasizing the importance of context in problem posing, English (1997) also indicated that it is necessary to focus primarily on the mathematical structure of the tasks. In this respect, focusing only on the problem's context without analyzing its mathematical structure would also negatively affect problem-posing performance.

When the aforementioned studies are investigated, it is understood that the presentation of the tasks has an effect on problem-posing performance. These studies commonly attribute the meaning of writing task-related, mathematically solvable, or arithmetically and semantically more complex problems to problem-posing performance. Bonotto and Santo (2015) further indicate that "problem posing is a form of mathematical creation: the creation of mathematical problems in a specific context" (p. 105). However, these studies do not provide information about whether task format has an influence on creative problem-posing performance. Additionally, there are various studies examining the relationship between problem-posing performance and creative thinking ability (e.g. Ayllon, et al., 2016; Harpen & Sriraman, 2013; Singer, et al., 2011; Yuan & Sriraman, 2010). Although these studies do not focus on the effect of the task format on creative problem-posing performance, it is still possible to draw some conclusions from them. First, it was emphasized that creativity skill has a stronger relationship with the flexibility and originality components compared to the fluency component. Silver and Cai (2005) indicated that fluency scores can be seen as an insignificant way to evaluate students' creativity. Contrastingly, originality is the dimension that receives the most emphasis among all the components of creativity (Kontorovich, Koichu, Leikin, & Berman, 2011). Kar

et al. (2019) analyzed the problems posed by pre-service mathematics teachers for a constantly growing visual pattern task that requires the arrangement of blocks according to the fluency, flexibility, and originality components of creativity. It was found in this study that the originality component predicts problem-solving performance more strongly. In this visually presented pattern, various problems could be written about different situations such as the surface area or volume of the blocks. Therefore, it was highly possible for a participant to pose many problems with different mathematical structures. This situation may result in higher flexibility and originality scores instead of fluency scores.

Second, studies particularly conducted with students in younger age groups emphasize that they pose a limited number of problems with a similar mathematical structure for visually presented patterns. For example, Cai (1998) asked sixth-grade Chinese and American students to pose problems for a figural pattern based on an array of dots (having a mathematical structure such as 6, 9, 12,…). The research results found that 80% of the problems devised in both groups were aimed at the first four given figures in the task. In addition, more than 68% of the students wrote problems comparing the number of dots in the figures. These findings indicate a lower performance in all creativity components. Besides the students' lack of pattern knowledge, their lack of experience in problem posing might be one of the reasons for these results. Another possible reason for this situation is that students might be affected by the pattern problems solved in the mathematics lessons. Heavily preferring the problems solved in the lessons might lead to lower scores, especially in the flexibility and originality components of creativity. For example, Rosli et al. (2015) analyzed the effect of problem-posing and -solving order on pre-service middle school teachers' problem-posing and -solving performances on a figural pattern (a ladder pattern with the mathematical structure of 1, 3, 6, 10,…). The research findings showed that most problems posed by the group that previously took the problem-solving test were similar to the problem structures in the problem-solving task (drawing any step in the pattern, asking the number of blocks corresponding to any step, asking the general pattern rule).

Last, in some research (Cai & Hwang, 2003; Xu, Cai, Liu, & Hwang, 2020), figural and daily life-related patterns are used together, and participants' problem-posing performance is investigated. However, these studies have not been directly structured on the differences in the fluency, flexibility, and originality aspects of creative thinking skill, based on the problems posed for the figural and written patterns. Moreover, the patterns used in these studies have different mathematical structures. Despite these limitations, these studies provide different results about the structure of the posed problems for figural and daily life-related patterns. For example, Cai and Hwang (2003) asked students in the sixth and seventh grades to pose problems for figural (a pattern including an

array of dots in a square and growing in a quadratic form) and written patterns related to daily life (the doorbell situation growing by a fixed number in the order of 1, 3, 5, 7…). As the research found, more problem categories were identified in the written than in the figural pattern. Consequently, it can be hypothesized that the higher number of problem categories in the written pattern indicated that the flexibility score would be much higher compared to that in the figural pattern. However, Xu et al.'s (2020) analysis of the problems that middle school students posed for figural (the pattern growing in a quadratic form and including an array of dots) and written patterns related to daily life (the doorbell situation with the mathematical structure of 1, 3, 5, 7,…) indicated that the higher number of problem types in the figural pattern demonstrated that the students' flexibility scores would be higher in the figural pattern compared to those in the verbal pattern. Furthermore, the rates of the problems that were written by adding new situations were 2% and 4%, respectively, in the figural and written patterns, which indicate a more difficult aspect compared to other problem types. These results assume that the written pattern provided an opportunity to produce more original problems.

2 Methods

2.1 Participants

In this research, 45 junior pre-service mathematics teachers who were studying middle school mathematics teaching program participated. Their curriculum involves Mathematics Teaching I and II courses, which focus on how to teach middle school mathematics topics to students and are given in the fall and spring semesters of the third grade. The purpose of this study was explained to 65 participants, in two sections, who were taking a Mathematics Teaching II course. Of them, 49 voluntarily agreed to participate in the study. However, four did not participate in either one of the two meetings where the problem-posing tests were held. Thus, these students' responses were not included in the analyses.

In the teacher training program, the participants are provided with a four-year education. Those who complete the program are certified to teach mathematics to middle school students (11-14 age groups). The program focuses on how to teach mathematics and includes courses on general culture and pedagogical and mathematical content knowledge. The participants take two courses in instructional methods for mathematics during their third year in the program. Furthermore, within the framework of these courses, training on problem posing and solving is provided, including training on the definition and importance of problem posing and its association with problem solving, and problem-posing types. Within the scope of these courses, Polya's (1957) problem-solving steps are introduced to the participants via sample problems. Problem-posing activities were also conducted to expand the problems in the looking-back step, the last

step of the problem-solving process. In addition, in the looking-back step, participants were encouraged to solve problems with different strategies. There were also some discussions held on the problems posed or solved by participants. As it is well known, such activities support creative thinking skills, although the participants did not take a course focusing only on creativity. In this paper, pseudonyms have been used for each participant.

2.2 Data collection tool and analysis

In order to determine the effect of the task format on pre-service mathematics teachers' creative problem-posing performances, a Problem-Posing Test (PPT) consisting of two parallel pattern tasks was created (see Figure 1). There are two main reasons for choosing the patterns subject. First, pattern tasks can be presented in different formats by relating them to daily life or visual shapes. In this respect, the patterns topic has been chosen since it allows preparing various tasks in different formats. Second, patterns tasks were widely used in the studies investigating the relationship between problem posing and creativity or between problem posing and problem solving (e.g. Cai, 1998, 2003; Kar et al., 2019; Rosli et al., 2015; Silber & Cai, 2017), because patterns tasks provide opportunities to include different mathematical concepts in the problems to be posed. In this respect, they can provide in-depth information about students' flexible thinking skills. The pattern rule in both tasks is in the format of $a_n=3n+1$, where the n-term refers to term order. Additionally, the curricula of the fifth to eight grade levels (11 to 14 age groups), where pre-service mathematics teachers would teach, mainly emphasize the teaching of a constantly growing pattern that grows by a fixed number (Ministry of National Education [MNE], 2018). In this context, the data collection tool was limited to such pattern types in which the participants had more experiences and would teach in the future.

The patterns used in the studies focusing on problem posing were generally presented in two different formats; daily life related or figural (Cai & Hwang, 2003; Harpen & Sriraman, 2013; Kar et al., 2019; Rosli et al., 2015; Silber & Cai, 2017). In these studies, these two variables were taken as the basic criteria that determine the task formats. In this respect, two patterns tasks were prepared. First pattern task was related to daily life but did not involve figural shape. On the other hand, the second task involved figural shape, but did not involve a daily life story. First, a pattern related to daily life was prepared and then a figural pattern suitable for mathematical structure of the first pattern was prepared. In the first PPT task, an open-ended story associated with daily life, which discussed the number of guests coming to a party every time a doorbell rings, was included. Cai and Hwang (2003) used this task to investigate sixth grade Chinese and American students' problem-posing skills. This task has also widely been used in other problem-posing studies related to patterns (e.g. Cai, 2003;

Silber & Cai, 2017; Xu et al., 2020; Yuan & Sriraman, 2010). Similarly, the figural pattern task in the PPT, which discusses an array of matchsticks in a square, has been widely used in problem-solving tasks (e.g. Rivera & Becker, 2007, 2008).

Party Task (PT)

Kübra had a birthday party and guests enter when the doorbell rings.
The first time the doorbell rang, 4 guests entered.
The second time the doorbell rang, 7 guests entered.
The third time the doorbell rang, 10 guests entered.

The pattern continued in the same way. At every following doorbell ringing, three more people came in than those coming at the previous doorbell ringing.

Write as many problems as you can for the open-ended story above.

Matchstick Task (MT)

The first three terms of a figural pattern, which has been structured with matchsticks, are given below. Write as many problems as you can for the following pattern.

1. Term 2. Term 3. Term

Figure 1. Problem-posing tasks.

The tasks in the PPT were given to pre-service mathematics teachers at different times, with the PT given first and the MT one week later. They were allowed 40 minutes for each task. The problems posed by the participants for both tasks were analyzed through inductive and deductive content analyses (Strauss & Corbin, 1998). In the problem posing tasks, firstly, the participants were asked to pose mathematically valid problems which should be related to given tasks. In this context, the problems were coded as viable and nonviable (see Figure 2) in line with the analysis schemas found in the literature (e.g. Harpen & Sriraman, 2013; Silver & Cai, 2005). The authors of this study, two coders, independently analyzed whether the posed problems were viable or nonviable. Then, the coders compared these analyses and the coding process completed. In light of the total completed analysis, it was determined that some responses were not pattern questions, the solution could not be found by the current data's use, the quantitative data in the problem were not consistent, and the problem was not clear enough. These responses were coded as nonviable and sample responses of these situations are given in the findings section.

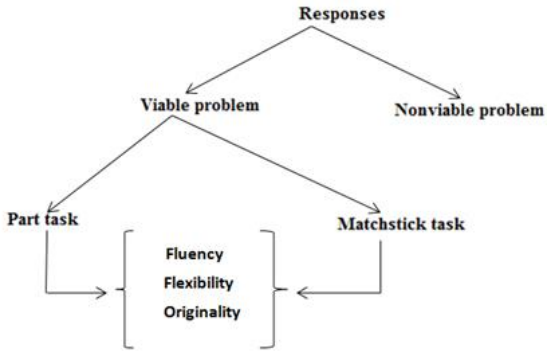


Figure 2. Schema related to the analysis of the problems.

In the second phase, viable problems were analyzed based on the categories of fluency, flexibility, and originality (see Figure 2). The fluency score was determined by calculating the total number of every pre-service mathematics teacher's viable problems. For example, if a participant was unable to write a viable problem in the PT, and another participant managed to write 5 viable problems, their fluency scores were coded as 0 and 5 points, respectively.

The flexibility score was calculated by considering the number of different problem types. According to Silver (1997), flexibility refers to "shifts in approaches taken when generating responses to a prompt" (p. 76). This definition is considered as a reference point and problem categories were determined accordingly. At the same time, in the analysis process, researchers benefitted from categories determined in various research about problems posing with respect to patterns (Cai, 2003; Cai & Hwang, 2003; Xu et al., 2020). For instance, Cai (2003) analyzed problems posed by 4th - 6th grade students about figural patterns and he determined dots in one figure, dots in more than one, comparing number of dots, and draw figure categories. Xu et al. (2020), on the other hand, determined number of guests, adding conditions, and general pattern about ring number or guests for PT. Considering these studies, each coder determined problem types. Problems asking different situations, problems including different mathematical concept, rule or operation were evaluated in different categories. Some pre-service mathematics teachers just only changed the numerical data and posed the same type of problems (sample problems are presented under findings section). This type of problems had the same structure and thus, they were joined under the same problem type. Coders, then, compared the types of problems they determined and finalized the classification. The pre-service mathematics teachers' flexibility scores were calculated by considering

how many problem types were included. For example, if a participant presented three out of 23 problem types in the PT, his or her flexibility score will be three.

In PT and MT, problem types were categorized with respect to the structure of problems under six categories: i) asking the number of guests/matchsticks, ii) asking the pattern rule, iii) asking the ring number/figure number, iv) adding extra conditions specified in the task, v) adding extra conditions or information not specified in the task, and vi) maintenance of the pattern. Some problems posed concentrated on the calculation of the number of guests (or the number of matchsticks). In this context, the order of ringing a bell (or a figure) with respect to the number of guests (or matchsticks) or the comparison of a ringing a bell (or figures) with respect to guests (or matchsticks) were the topics of the problems posed. These problems were collected under asking the number of guests/ matchsticks category. Considering the asking the pattern rule category, problems were posed to determine the general rule of the patterns. Some pre-service mathematics teachers asked the new pattern rule by changing the number of incoming guests when the bell rings at the first time in the PT. In MT, in addition to the number of matchsticks, some participants asked the general rule of the pattern over different situations such as the number of squares in each shape. This category was expanded in a way that it covers such responses. Under asking the ring number/figure number category, the order of ringing a bell (or the order of shapes) with respect to the number of guests (or the number of matchsticks) was asked. Some pre-service mathematics teachers considered the conditions related to mathematical properties in numerical values while posing problems. For instance, the number of matchsticks (or guests) or the number of the order of ringing a bell (or a shape) is the focus issues while posing problems. These problems are categorized under adding extra conditions specified in the task category. In adding extra conditions or information not specified in the task category, the addition of a condition or information which is not seen in a pattern is the matter of this category. Lastly, some pre-service mathematics teachers posed problems which necessitated continuing a few steps of a pattern (e.g. as in MT, asking to draw a few steps of a shape). These types of problems were collected under maintenance of the pattern category. Sample answers for the problem types under these six categories are presented in findings section.

Finally, the originality of each of the responses was determined according to their rareness. To determine the originality score, the problem types observed in less than 10% of the pre-service mathematics teachers were defined. As 45 participants in total participated in the study, the problems written by five or more were not accepted as original. Thirteen and 18 problem types were judged as original in the PT and MT, respectively. Each original problem type was given 1 point to determine the participants' originality scores. For example, if a

participant presented two original problems in the MT, his or her originality score will be two.

To determine whether there was a difference between the pre-service mathematics teachers' fluency, flexibility, and originality scores in the PT and MT, a Wilcoxon test was applied, as the data were not distributed normally. Furthermore, the effect size was also calculated in the conditions where statistical differences were a matter of concern. According to Cohen's (1998) interpretation of the effect size, anything greater than .5 is large, .5-.3 is moderate, .3-.1 is small, and anything smaller than .1 is trivial. The responses to and detailed descriptions of every stage of the analysis process are presented in the findings section below.

3 Results

3.1 Distribution of the conditions where the problems posed are viable and nonviable

The pre-service mathematics teachers gave 332 responses in the PT, and the response mean per participant was 7.4. As for the MT, there were 330 responses in total, and the response mean per participant was 7.3. In the PT and MT, 9.9% (33) and 12.7% (42) of the responses were nonviable problems, respectively. Sample problems for the nonviable category are given in Table 1.

Table 1

Examples of nonviable problems

No	Problem	Task type	Nonviable
1.	It is known that the number of girls and boys in the first coming group is not equal. After how many doorbell rings will the number of girls and boys among the guests come to be equal? (Gülseren)	PT	Insufficient data
2.	The total number of guests coming to the birthday party is 4 times the number of guests arriving at the second ring. Accordingly, how many times did the doorbell ring in total? (Durmuş)	PT	Inconsistent data
3.	At which doorbell ring do 71 people enter? (Dilda)	PT	Inconsistent data
4.	Which term shape has a perimeter of 240 cm? (Aslı)	MT	Insufficient data
5.	Find the general pattern term (Fatma)	MT	Not clear enough
6.	How many matchsticks were used in the term where the number of matchsticks was prime for the first time? (Girgin)	MT	Not a pattern problem

According to Table 1, as the number of girls and boys entering at every doorbell ring in the first problem was not defined, the problem could not be solved. In this respect, the problem had insufficient data. According to the second problem in Table 1, 7 guests would enter at the second doorbell ring. In this case, 4x7=28 total of guests would come to the party. However, the total of guests at the party would never be 28 in any case. Similarly, in the third problem, at which doorbell ring do 71 people enter is asked. With reference to the pattern rule of an=3n+1, n∈N would not be provided such that 3n+1=71. Therefore, the data in the problems written by both pre-service mathematics teachers was inconsistent.
In the fourth problem in Table 1, it was asked which term was the figure with a circumference of 240 cm. The term number in the task being n, at the figure's circumference 2n+2 matchsticks would be obtained. However, this problem was impossible to solve since the length of a matchstick was not provided. Thus, the problem had insufficient data. In the table's fifth problem, the general pattern term was asked. Various pattern rules would be structured depending on the number of matchsticks, the circumference of the figure, and the number of squares in this figural pattern. Therefore, statements given in explanation of the problem were not clear enough. In the last problem, the number of matchsticks was a prime number for the first time in the second figure. The answer to this problem would be directly achieved by referencing the first three figures given in the pattern. Therefore, the problem does not require the use of the pattern in the given task.

3.2 Creativity results of the party and matchstick tasks

Fluency

In an effort to determine the fluency scores, the number of viable problems of each pre-service mathematics teacher was calculated, showing that 90.1% (299 responses) and 87.3% (288 responses) of the responses given in the PT and MT, respectively, were viable problems. The highest fluency score of a participant in the PT was 13, while the lowest was 1, resulting in an average fluency score of 6.6. The highest fluency score of a participant in the MT was 12, while the lowest was 0, resulting in an average fluency score of 6.4. According to the Wilcoxon test's results, there was no statistically significant difference between the participants' fluency scores in the tasks ($z=-.669$, $p=.503>.05$).

Flexibility

To calculate the flexibility scores, the problems created with the same mathematical structure in every task were counted as one. For instance, the two following problems structured by Dilda in the PT were counted as one problem type.

Problem 1: What is the difference between the number of guests entering at the 11th and 7th doorbell rings?
Problem 2: What is the difference between the number of guests entering at the 13th and 9th doorbell rings?

In the PT, 23 problem types were identified in the pre-service mathematics teachers' responses and were then sorted into six categories. The names of these categories and sample problems are given in Table 2. Among these six categories, most of the problem types were seen in adding extra conditions or information not specified in the task category (Table 2, for PE17-22 problem types), while the least were seen in maintenance of the pattern category (1 problem type). When considering the distribution of the number of problems, 45.2% were oriented toward asking the number of guests. Asking the ring number (20.7%) and adding extra conditions or information not specified in the task (20.4%) were the other categories for which a relatively greater number of problems were written. On the contrary, maintenance of the pattern (2%) or adding extra conditions specified in the task (3.3%) were the categories for which the least number of problems were written.

In the MT, 30 problem types were determined and were then sorted into six categories (see Table 3). According to Table 3, most of the problem types were seen in the adding extra conditions or information not specified in the task category (ME17-29), while the least were seen in maintenance of the pattern category (MF30). When considering the distribution of the number of problems in these categories, in approximately half of the 288 viable problems (46.5%), was oriented toward asking the number of matchsticks. In addition, the other two categories in which the greatest numbers of problems were posed were under asking the figure number (19.5%) and adding extra conditions or information not specified in the task categories (18.7%). Conversely, the least number of problems were written in adding extra conditions specified in the task (1.7%) and maintenance of the pattern (1.4%) categories.

In the PT, the pre-service mathematics teachers were able to write 10 problem types at most and 1 problem type at least. The average flexibility score was 4.7. In the MT, they were able to write 9 problem types at most and 0 problem types at least. The average flexibility score was 5.2. According to the results of the Wilcoxon test, no statistically significant difference between the participants' flexibility scores was determined ($z=-1.549$, $p=.121>.05$).

Originality

In the PT, 13 original problems were determined: one original problem (PA3) in the category of asking the number of guests; two original problems (PB6-7) in the category of asking the pattern rule; two original problems (PC10-11) in the category of asking the ring number; five original problems (PD12-16) in the

category of adding extra conditions specified in the task; and lastly, three original problems (PE20-22) in the category of adding extra conditions or information not specified in the task.

Table 2

Problem categories determined in the party-task.

Categories		*F(%)***	*Exemplary problem*
$PA_{1\text{-}4}$*:	Asking the number of guests	135(45,2)	How many people came to the party between the 70^{th} and 75^{th} doorbell rings? (Buket, PA_3)
$PB_{5\text{-}7}$:	Asking the pattern rule	25(8,4)	If 5 people entered at the first doorbell ring instead of 4, and other guests continued entering according to the same rule, how many people would come in at the 5^{th} doorbell ring? (Şahika, PB_6)
$PC_{8\text{-}11}$:	Asking the ring number	62(20,7)	At which doorbell ring did the 200^{th} person enter? (Karabayır, PC_{11}) If 22 people enter at a doorbell ring, what number is this doorbell? (Alçiçek, PC_9)
$PD_{12\text{-}16}$:	Adding extra conditions specified in the task	10(3,3)	If the guests already present at the party following the 17^{th} doorbell ring were sitting in threes at the tables, how many people would be standing? (Çelebi, PD_{12}) How many times does the doorbell need to be rung to make the total number of guests present at the party 10 times the order of the last doorbell ring? (Demir, PD_{16})
$PE_{17\text{-}22}$:	Adding extra conditions or information not specified in the task	61(20,4)	The first guests entered at 10:00 p.m., ringing the first doorbell. Afterward, every half-hour, a doorbell was rung. Accordingly, how many guests in total would have entered the party by 12:40 a.m.? (Mazlum, PE_{19}) How many handshakes in total would be among the guests entering following the first four doorbell rings? (Kibar, PE_{21})
PF_{23}:	Maintenance of the pattern	6(2)	Please write the first 10 terms of this pattern. (Fatma, PF_{23})

Table 3

Problem categories and types determined in the matchstick-task

Categories	*F(%)***	*Exemplary problem*
$MA_{1\text{-}6}$*: Asking the number of matchsticks	134(46,5)	What is the sum of the number of matchsticks in the 107th and 83rd figure? (Dilda, MA_4) How many matchsticks are needed to construct 10 squares? (Mazlum, MA_6)
$MB_{7\text{-}10}$: Asking the pattern rule	35(12,2)	Please determine the general rule giving the number of matchsticks at the circumference of the figure in the pattern. (Mazlum, MB_{10})
$MC_{11\text{-}14}$: Asking the figure number	56(19,5)	In the figures, diagonals are only drawn inside the squares. Accordingly, which figure contains 26 diagonals therein? (Ayşenur, MC_{14})
$MD_{15,16}$: Adding extra conditions specified in the task	5(1,7)	If the total number of matchsticks in a figure structured according to this pattern is a three-digit number, what is the smallest number of matchsticks used? (İrem, MD_{16})
ME: Adding extra conditions or information not specified in the task		
Length ($ME_{17\text{-}21}$)	23(7,9)	The length of a matchstick is 3 cm. Accordingly, how many matchsticks are used in a figure with a circumference of 450 cm? (Aslı, ME_{17}) If a matchstick is 2 cm in length, what is the diagonal length of the largest rectangle in the 11th figure? (Büşra, ME_{21})
Area ($ME_{22\text{-}24}$)	12(4,2)	If the length of a matchstick is 4 cm, how many matchsticks are used to construct a figure with an area of 320 cm^2? (Çiğdem, ME_{22})
Time ($ME_{25,26}$)	5(1,7)	In Figure 1, it takes 5 seconds for a spider to move from an edge of the figure and then return to that same edge. If the spider moves at the same speed, how many seconds does it take the spider to rotate the circumference of the 98th figure? (Aslı, ME_{25})
Figure type (ME_{27})	1(0,4)	What is the total number of rectangles in the 8th figure? (Elvan, ME_{27})
Connection number (ME_{28})	5(1,7)	Inasmuch as a flower pattern is drawn at each of the matchsticks' connection points, how many flowers are drawn in the 10th figure? (Mazlum, ME_{28})
Price (ME_{29})	8(2,8)	Inasmuch as the price of 4 matchsticks is 25 cents, how much does the 12th figure cost? (Nur, ME_{29})

MF_{30}: Maintenance of the pattern	4(1,4)	Accordingly, please draw the sixth figure (Karakurt, MF_{30})

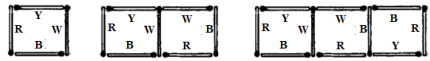
* MA1-6: It means that there are six problem types in category A.
** The data was calculated in Frequency (Percentage) over the number of viable problems.

In Table 2, PC11 is an original problem written by Karabayır. The problem asks at which doorbell ring the 200th guest comes in. Additionally, some of the original problems are as follows:
Kübra gives blue hats to the first group coming in, yellow hats to the second group, and red hats to the next group. She distributes colored hats respectively in this manner. Accordingly, if the doorbell is rung 17 times, how many hats of which color are there in this group at most? (PB7, Emine)
In the event that everyone at the party sits in fours around the tables, one person stands while they sit in threes, and no one stands, inasmuch as it is known that the total number of people is less than 80, how many people are there inside at most? (PE20, Halil)
Inasmuch as it is known that Kübra's best friend enters at either the fifth or sixth doorbell ring, what it the possibility that s/he is the 67th person to enter the party? (PE22, Seval)
In the MT, 18 problem types were considered as original: one original problem (MA4) in the category of asking the number of matchsticks; three original problems (MB8-10) in the category of asking the pattern rule; two original problems (MC13-14) in the category of asking the figure number; two original problems (MD15-16) in the category of adding extra conditions specified in the task; nine original problems (ME17, ME20-22, and ME24-28) in the category of adding extra conditions or information not specified in the task; and lastly, one original problem (MF30) in the category of maintenance of the pattern (see Table 3). Examples of original problem types which are not representatively given in Table 3 are presented in Table 4.

Table 4

Sample problems for the original category in the matchstick-task

No	*Categories*	*Exemplary problems*
1	MB_8	The squares in the figures are numbered with consecutive natural numbers as follows: the odd-numbered squares are colored in red; the even-numbered squares are colored in blue. How many red squares are there in the 22nd figure? (Mazlum) 
2	MB_9	Selin colored the matchsticks in red, blue, white, and yellow. Every figure is structured counterclockwise in the order of R, B, W, Y,

		starting from the vertical matchstick on the left. Hence, in which figure are all the colors used in equal numbers? (Emine) 
3	MD_{15}	There are 20 matchsticks in every box. How many boxes should be used to construct the 21st figure? (Seher)
4	ME_{24}	The length of a matchstick is 3 cm. If Ayşe has 93 matchsticks, how many cm^2 does the area of the last figure to be structured have? (Seval)

The greater number of problem types in the MT resulted in an increase in the number of problems in the original category. However, the fact that a problem observed in less than 10% of the pre-service mathematics teachers does not guarantee that it is complex. For instance, Seher posed a problem oriented to the division of the total number of matchsticks by 20 and discussed the interpretation of the remainder in the first problem in Table 4. The problem takes the calculation of the number of matchsticks in the 21st figure a step forward. Even though the problem is included in the original category, when considering the pre-service mathematics teachers' level, it is difficult to say that the problem is a complex one. Similarly, the fourth problem in Table 4 is concentrated on the arithmetical operations oriented to the area concept, while the first and the second problems discuss the formation of different patterns over a pattern. In Table 3, the problem written in the ME27 category asks the total number of rectangles in any one of the figures. These problem types require more advanced reasoning skills beyond the arithmetical operations.

The pre-service mathematics teachers' average originality scores in the PT and MT are 0.51 and 0.89, respectively. According to the Wilcoxon test's results, a significant difference in favor of the MT among the originality scores is determined ($z=-2.174$, $p=.03<.05$, $r=.23$). The effect level of the statistical difference among the originality scores is in a small range.

4 Discussion and conclusions

This study aimed to contribute to the problem-posing literature by investigating the effect of task format on pre-service mathematics teachers' creative problem-posing performance. Similarities and differences are determined among the problems that the participants posed in both tasks. The rates of the number of responses and the viable problems are high and close to each other for both tasks. That the average number of problems posed in the tasks is above seven shows that the participants have a high problem-posing performance. In addition, the rate of nonviable problems in each task is low and close to each other (9.9% and 12.7% in the PT and MT, respectively). Considered together, these quantitative

results show that the participants' problem-posing performances do not vary depending on the task's representation type.

Conversely, when considering the quality of the problems posed for both tasks, it is evident that some differences and similarities are remarkable. When the distributions for the fluency component of creativity are compared, the similarities become more prominent. The maximum numbers (13 and 12, respectively) and means (6.6 and 6.4, respectively) of the problems written in the PT and MT are very close to each other. The statistical results also show that there is no significant difference. Similarly, some of the studies in the literature indicate that compared to the other components, fluency is the least effective in interpreting participants' performances and does not provide adequate data by itself. As an example, in a study on the effect of the components of creativity, as reflected in problem-posing, on pre-service mathematics teachers' problem-solving abilities, it was determined that the fluency score was the least predictive component (Kar et al., 2019).

The first step in producing creative things is to generate as many different ideas as possible. However, producing many ideas does not always guarantee creative results and, therefore, fluency should be judged in conjunction with flexibility and originality (Balka, 1974; Carreira & Amaral, 2018; Vale et al., 2018). Despite the fact that no statistically significant difference was determined between the participants' flexibility scores, when the problem types are comparatively analyzed, differences are found between the tasks regarding the number of problem types. While 23 problem types were determined in the PT, 30 problem types were determined in the MT. It is understood that the MT, in this respect, has more effectively stimulated the posing of a variety of problems than the PT has because the figural patterns provided an opportunity to associate with various mathematical concepts, including area, circumference, length, angle, and probability, as well as stimulated an analysis of the relationships among the information pieces.

Asking the number of the matchsticks/guests or figure/ring were the most preferred problem types in both tasks. These types of problems have been widely emphasized in educational tasks or textbooks for patterns (Zaskis & Liljedahl, 2002). Hence, the obtained results can be associated with the pre-service mathematics teachers' learning experiences. Unfortunately, given this research's data, no detailed explanation can be given regarding the reasons for this situation. Therefore, more examinations with qualitative approaches are needed.

Differences in the types of problems have emerged, especially in the category of adding extra conditions or information not specified in the task. While this category covered six problem types in the PT, this number increased to 13 in the MT. In the PT, associations with situations such as probability, combination, time, and gift prices gained prominence, while in the MT, associations with

situations such as length, area, circumference, figural types, and number of matchstick connections were more likely. Additionally, more problem types were in favor of the MT in the categories of asking the number of matchsticks and asking the pattern rule. Consequently, the MT has provided more opportunities in creating a variety of problem types, in association with the pattern of various mathematical concepts and in thinking of different pattern types.

When looking at the results of the originality component, a statistically significant difference in favor of the MT was determined, and its effect size was small. In the MT, nine problems in the category of adding extra conditions or information not specified in the task were judged as original, while in the PT, this number was only three. In parallel to other research (Harpen & Sriraman, 2013; Yuan & Sriraman, 2010), the problem types observed in less than 10% of the participants' responses were accepted as original, although the less-observed problems are not meant to be difficult or very interesting. As such, when the qualities of the problems posed in the originality category are compared, mathematically more difficult and interesting problems were observed in the PT. However, some of the participants who posed original problems in the PT wrote original problems (for example, the problems posed by Aslı and Emine in the findings section) adopting the same approach in the MT task as well, which is another remarkable situation. In these cases, it has been observed that the problems in the MT were mathematically more difficult. Thus, it is understood that the figural pattern contributed to the participants posing mathematically more difficult and interesting problems. However, how this occurred and the way of thinking of the participants who were unable to write original problems in one task but who wrote original problems in another task still remain questions to be answered. Hence, researching such questions with qualitative approaches may provide more enlightening results, especially regarding the originality component of creativity.

Developing students' creative thinking skills is a main purpose of mathematics education research (Mann, 2006). However, the results of the research have indicated that the teachers' knowledge of how to develop students' creative thinking skills is still lacking (Shriki & Lavy, 2012) and, consequently, students are provided with few opportunities to experience creative thinking and learning in class (Silver, 1997; Sriraman, 2005). Problem posing has a close association with creativity as well as with problem solving (Haylock, 1997; Silver, 1997). Therefore, to develop creative thinking skills, learning environments should be enriched with problem-posing tasks. Since the patterns are open-ended, allow establishing an in-depth connection with a great variety of mathematical concepts, and contribute to the development of problem-solving and -posing skills as well as communication abilities in students, they also stimulate students'

creative development (Vale et. al., 2012). The results of this research do not assert that only one of the figural or written pattern types must be preferred to stimulate creative thinking skills related to problem posing. Instead, the results emphasize that each of the written and figural patterns has its own strengths. For example, the problems related to the use of the combination and probability concepts were structured in the PT, whereas these problem types were not found in the MT. However, the MT more effectively stimulated the association with a variety of mathematical concepts and, in this context, the writing of mathematically more difficult problems. Considering these results together while including problem-posing tasks for both written and figural patterns to improve the flexibility and originality components of creativity is supported, and the use of problem-posing tasks for figural patterns may be further recommended.

Since this research's data were obtained from only a small group of pre-service mathematics teachers at a university, the results cannot be generalized. However, we still believe that the outcomes we have obtained provide educational value and will make a potential contribution to studies connecting creativity and problem posing. The results of this study indicated that participants' problem-posing performances in the components of creativity differ according to the task format. Although the participants scored higher in the flexibility and originality components for the MT, a statistical difference was observed only in the originality component. Given this, the task format should be considered as an important variable when evaluating participants' problem-posing performance through the originality component. Thus, clearer evaluations can be made about participants' creativity.

Considering the original problem types, pre-service mathematics teachers posed problems that were cognitively more difficult to solve in the MT. Due to its quantitative nature, this study does not provide data about the complexity of the problems. Therefore, this situation must be questioned in further studies. In this study, the originality was evaluated by considering the rareness of the posed problems. For this reason, it does not necessarily mean that each original problem type implies a difficult problem. Unlike the problems found in the textbooks, originality is also defined as posing problems with surprising relationships between concepts and components (Singer et al., 2011). Accordingly, the analyses to be conducted can also highlight the complexity of the problems. This perspective of originality can be adapted in further studies. Thus, the effect of the task format on the originality component can be revealed in detail. Therefore, it is crucial to carry out in-depth research in this field.

In addition, the fluency, flexibility, and originality scores are affected by the sample size. Conducting similar studies on larger samples may provide more valid conclusions about possible differences. This study has considered task formats in written form related to daily life and including figural patterns.

Figural patterns can also be structured based on whether they explicitly provide the pattern rule (Barbosa & Vale, 2016). The effect of these types of problem-posing tasks on creativity components is another case that can be investigated. Finally, another criterion is the task's mathematical structure, which affects participants' performance in pattern tasks (Lannin, Barker, & Townsend, 2006). In this research, a growing pattern that grows by a fixed number is used. Therefore, it should be possible to carry out similar research studies over the repeating or quadratic patterns. Such research can further deepen our understanding of the impact of different variables, such as a task's representation and structure, on the ability of creative problem-posing performance.

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Receiving Education in a Different Country: Challenges Encountered by Foreign Students and Proposed Solutions

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Abstract:

Introduction: The purpose of this study is to determine the problems of primary and secondary school teachers about foreign students and propose solutions to these problems.

Methods: In the research, qualitative research method was conducted. Primary and secondary school teachers who had at least one foreign student in their class and volunteered to participate in the study in one of the provinces of Middle Black Sea Region of Turkey were included in study group. They were 29 participants in total (15 female and 14 male). The classes of the teachers generally included 1-5 foreign students. As a data collection tool, a semi-structured open-ended questionnaire consisting of 7 questions was used. After data collection, analyses were performed with content analysis method.

Results: Findings of the study reveal that the most basic problem experienced by foreign students is the language problem. Students had difficulty in understanding their environment because of this problem and this situation brought problems of adaptation to school, the teacher and classmates. Especially the students whose parents did not know Turkish experience these problems more than others because of the lack of support from their parents. The majority of the teachers mentioned that they could not reach the achievements in the education programs with these students, and they stated that they included additional activities related to reading and writing. Conducting orientations programs, language and literacy courses, family education (especially language teaching to families), providing therapy for children who had a tendency to violence, providing a separate education program for foreign students and providing training by teachers who were their own citizens in separate classes were among the proposed solution obtained as a result of the research.

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Discussion: The opinions of the teachers were evaluated under the themes of positive opinions about foreign students, the level of achievement of outcomes, additional activities, experienced problems, the way teachers solve problems, and teachers' suggestions for solutions. The study shows that the first problems of foreign students that need to be solved are language and communication problems. Also, parents are as important as students in teaching foreign students and that parents' language skills are critical in terms of informing parents and conducting the process with school-family cooperation. Furthermore, it is of great importance that foreign students must not be alienated because of their culture, that they must not be excluded by other students, and that they must primarily be helped to ensure their adaptation and integration into culture and school through activities.

Limitations: The study group of the research includes 29 primary and secondary school teachers who had at least one foreign student in their class and volunteered to participate in the study in one of the provinces of Middle Black Sea Region of Turkey.

Conclusions: Based on the results obtained throughout the study, it is possible to say that taking into account the given recommendations can contribute to the solution of the problems of foreign students. Further research can be conducted in different context to shed light on different problems of foreign students experience and proposed solutions to these problems.

Key words: foreign students, problems, proposed solutions, teacher.

Introduction

From time to time, geographical, social, political, and economic events force people to migrate from their places. Especially in recent years, wars and internal upheavals have led to large waves of migration. Turkey's political and geographical position causes to attract more migration than other countries, and the number of people migrating to Turkey is increasing day by day. According to the latest TUIK Reports (2018), the number of migrations from abroad to our country increased by 22.4% in 2017 compared to the previous year. Migrations have economic, cultural, social, and demographic impacts, as well as educational impacts. As a matter of fact, about half of those who immigrate to the country consists of a child population and this situation requires that the educational needs of these children should be supplied. According to the United Nations High Commissioner for Refugees (UNHRC) report, education of migrant children can perform many functions, such as social integration, providing a stable and safe environment, and responding to psycho-social needs, though 61% of these children do not receive education even at the primary school level

(UNHCR, 2017). It is believed that students who receive education do not get enough efficiency from the education they receive (Aslan, 2001; Bozan & Kaştan, 2018).

People are temporarily or permanently migrating from one place to another for different reasons (Hagen-Zanker, 2008). The causes of international migration include political instability, human rights violations, repressive regimes, civil wars, ethnic conflicts, economic hardship, and fear of life safety (Deniz, 2014; Saklan, 2018). As a result of mass migration movements caused by events, such as the war, migrants are found as refugees or asylum seekers in various countries (Lordoğlu, 2015). The number of these refugees and asylum seekers has increased rapidly in recent years. Turkey, in particular, has been greatly affected by this situation. As it is known, all over the world, the children need protection and care for their development (Bulut, 2020) and according to the education policies of the Turkish Ministry of Education, all children, including foreign children, have the right to receive education at the level of primary and secondary education in Turkey (Bircan & Sunata, 2015). But it seems that foreign students face different problems in schools. Many studies aimed at identifying the problems faced by students and suggestions for solutions to these problems are included in the literature. However, many of these studies focus on students at higher education level (Kıroğlu, Kesten, & Elma, 2010; Kumcağız, Dadashzadeh, & Alakuş, 2016; Şahin & Demirtaş, 2014). Also, studies usually include surveys on students at the primary school level (İmamoğlu & Çalışkan, 2017; Sarıtaş, Şahin, & Çatalbaş, 2016) or students of a certain nationality (especially Syrian) (Aykırı, 2017; Büyükikiz & Çangal, 2016; Levent & Çayak, 2017). This study aims to handle the problems experienced by different foreign students at different education levels and reveal the suggestions for the solutions to these problems. Therefore, in addition to many studies in the literature, the aim of this study is to identify the problems experienced by teachers carrying out teaching activities at the primary and secondary school level with foreign students and the solution proposals for solving these problems. For this purpose, teachers with foreign students in their classes were asked about their general opinions about these students, their level of access to the education outcomes in teaching programs, and the additional teaching activities (method, technique, material, etc.) that they have specially configured for these students during the teaching process. In addition, teachers were asked about the problems they faced with these students, the way they solved these problems, and their suggestions for solving the problems, so their ideas about these issues were taken. The opinions of teachers who have foreign students in their class about the problems of these students are important in terms of discovering what kind of problems students face and what can be done to solve them. In addition, the discovery of activities that these teachers perform to ensure that their students participate and

adapt to the lesson will also serve as an example for other teachers who have foreign students in their class.

1 Methods

1.1 Research design

In the research, qualitative research method was employed, and basic qualitative research design was conducted. The basic qualitative research tries to reveal how the researchers "make sense of a situation, process, perspective or world view" of the participants. In this design, an inductive strategy is used, and descriptive results are obtained. The data obtained are presented in a rich and descriptive manner and discussed using the literature (Merriam, 2002, p. 6). By using this design, this study focused on the problems that teachers experienced with students, ways to solve problems, and solutions. Also, the general views of teachers about these students, their access to the course outcomes included in the curriculum, and the additional activities they organized were also explored and tried to be presented in descriptive manner.

1.2 Study group

In this study, the criterion sampling method, which is one of the sampling methods used in qualitative research methods, was employed. In the criterion sampling method, sampling which will be the subject of research is created by determining specific criteria by the researcher. In this study, the criteria were that teachers who will participate in the research must have more than one foreign student in the classrooms. Twenty-nine teachers, who worked in primary and secondary schools in one of the provinces of Middle Black Sea Region of Turkey, who had at least one foreign student in their classes, and who volunteered to involve in the study, participated in the study. Demographic information about teachers is provided in Table 1.

Table 1

Demographic information about teachers

Demographics	*Category*	*Frequency*
Gender	Women	15
	Men	14
Age	31-40	8
	41-50	11
	51 and above	10
School	Primary	16
	Secondary	13
Seniority (years)	11-20	10
	21-30	10

	31-40	7
	41 and above	1
Number of foreign students	1-5	25
	6-10	4
Total number of students	10-20	8
	21-30	10
	31-40	11
Nationality of foreign students	Afghanistan	27
	Iraq	18
	Syria	2
	Iranian	1
	Turkmenistan	1

As can be seen in Table 1, 15 of the teachers are women and 14 are men. Eight teachers are in the age ranges of 31 - 40 years, 11 teachers are in 41-50 years, and 10 teachers are 51 and above. 16 of the teachers work in primary schools, and 13 work in secondary schools. Looking at seniority years, it is seen that 10 teachers have seniority years in the range of 11-20 and 21-30 years, 7 teachers with 31-40 years, and 1 teacher with 41 years and above. The number of foreign students in teachers' classes varies generally from 1 to 5 (n=25). There are 4 teachers with 6 to 10 foreign students. There are 8 teachers with 10-20 students, 10 teachers with 21-30 students, and 11 teachers with 31-40 students. Students usually come from Afghanistan (n=27), followed by Iraq (n=18), Syria (n=2), Iran and Turkmenistan (n=1).

1.3 Data collection tool

A semi-structured open-ended questionnaire consisting of 7 questions was used as a data collection tool in the study. Expert opinion was taken to ensure the scope and face validity of the questionnaire form. Two of the experts work in the Department of Curriculum and Instruction and one in the Department of Educational Administration and Planning. In the first part of the questionnaire form, the purpose and instruction of the research were included, the participants of the study were informed about the subject and their consent was obtained. In the second part, teachers' information about gender, age, school type, seniority, number of students, and foreign students in the class was included. In the third part, there were questions about teachers' general thoughts about foreign students, their ability to reach the learning outcomes with foreign students, additional activities they do for these students, experienced problems, solutions they have developed for these problems, and their suggestions for solving these problems.

1.4 Data analysis

The data were collected and analysed by using the content analysis method. Content analysis involves combining the data obtained under certain concepts and themes and organizing and interpreting them in a way that the reader can understand (Yıldırım & Şimşek, 2008). To ensure the validity and reliability of the research, methods such as depth-oriented data collection, detailed description, and coherency analysis were used. To ensure depth-oriented data collection, participants were not limited in time to fill out questionnaires, and they were required to write down their questions in detail under the questions in the form. To provide a detailed description, direct citations were often included in the results. In addition to obtaining expert opinion for scope and face validity to ensure consistency in the research, coding in the analyses was done separately by two researchers, and the findings were regulated to the extent that consistency was achieved. To strengthen the transfer of research results to similar study environments, the participants' information, steps for collecting and analysing data were explained in detail.

1.5 Ethical considerations

The teachers were informed about the purpose of the research and information was given about the researchers in order to comply with the ethical rules in the study. In addition, the participating teachers were informed about the possible outcomes of the study, and where the information obtained from the study would be used was expressed. In the form where the contact information of the researchers was given, it was stated that participation in the study was voluntary, and the participants could leave the study at any time. In this sense, the research was conducted with the approval of the participating teachers.

2 Results

The opinions indicated in accordance with the questions asked to teachers with foreign students in their classes were organized under the themes of positive opinions about foreign students, the achievement level of learning outcomes, additional activities, experienced problems, the way teachers solve problems, and teachers' suggestions for solutions to problems.

2.1 Positive opinions about foreign students

Within the scope of the research, teachers were first asked about their general thoughts about students. Some of the teachers were determined to have positive views regarding foreign students in their classrooms, and these opinions were evaluated under the theme of “positive opinions”. Content analysis results for this theme are presented in Figure 1.

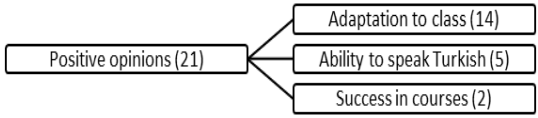

Figure 1. Codes on the theme of "positive opinions".

As shown in Figure 1, the codes under the theme of positive opinions about foreign students include adaption to the class (f=14), ability to speak Turkish (f=5), and success in courses (f=2). Some of the teachers stated that foreign students in their class were conformable to the class environment. According to the teachers, although students experienced adaptation problems and behaved timidly in the first few months, they did not have much difficulty in adapting to the classroom. *"They are very young and do not have a problem with their friends in general. I think there is a language called 'Children's language', and students can communicate very well with each other by using this language." (T10) and "These children who leave their country out due to necessity are timid at first and can soon adapt to the classroom environment."* (T17)

One of the biggest factors in the adaptation to class is the knowledge of the language. As a matter of fact, teachers expressed the students' ability to speak Turkish well as a positive situation, noting that students can adapt to the class and school culture because they know Turkish. One of the teachers stated that speaking language well was one of the positive aspects by using the expressions *"Afghan students are more conformable with school culture than our own students. They use Turkish better."* (T21) Students' ability to speak well is also a factor in their success. In this subject, one of the teachers used the expressions *"I have two siblings in my class. The boy speaks Turkish better because he came to Turkey earlier than his sister. His adaptation to the lessons and his friends is also fine. He loves to read books. He is also very successful in mathematics."* (T29) and mentioned that his student was able to achieve success in the class thanks to his ability to speak Turkish language well. Another teacher who mentioned success in classes stated that his student from Afghanistan was more successful than the Iraqi student. The teacher's own statement is that *"Afghan students in our class are more interested in the lesson than Iraqi students. They're very, very good at writing-reading or math."* (T20)

2.2 Achievement level of learning outcomes

Whether the learning outcomes of the courses were achieved by foreign students was the next question of the research. Under the theme of achievement level of learning outcomes, teachers' responses are described under the codes of negative

(f=12), vary according to the situation (f=10), and positive (f=7). Content analysis results for this theme are as follows:

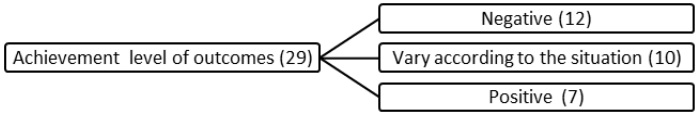

Figure 2. Codes related to the theme of the "level of achievement of the outcomes".

As shown in Figure 2, 12 of the teachers mentioned that they could not achieve learning outcomes with foreign students. According to the teachers, students' communication problems and lack of knowledge of Turkish constitute the biggest obstacle to the achievement of the learning outcomes. T10 referred to this situation through the phrase *"There's no way they can get the outcomes in the program when there's a lack of communication. We can only teach reading-writing. But reading doesn't mean much either. Because most of the time they can't understand what they read."* Ten of the teachers mentioned that the level of outcome varied according to lessons, student status, and class level. For example, one of the teachers used the phrases *"There's nothing wrong with the math. There is a problem with Turkish and Social Science lessons. They're having trouble understanding them."* (T9), indicating that students suffer more problems in lessons that require reading and comprehension. T2, on the other hand, mentioned that the student status and class level were effective in achieving learning outcomes, with their explanations like *"We experience no problem with those who speak the language and come long ago. (...) Those who are in intermediate level of the classes and have language problems don't accomplish to get learning outcomes."* Finally, 7 of the teachers mentioned that they were able to provide students with achieving the learning outcomes. One of the teachers' own statements on this subject are as follows: *"I can achieve the vast majority of the outcomes in the curriculum with my students who previously went to the language course and learned Turkish. Even many of my foreign students who have learned Turkish show similar success with my Turkish students."* (T23)

2.3 Additional activities

Another interest of the study refers to the question of whether teachers conduct additional activities for foreign students, and what kind of activities they participate in if they do. Teachers who stated that they did additional activities listed these activities as reading-writing activities (f=16), using games/visuals (f=8), speaking activities (f=4), four operations activities (f=4), and Turkish

teaching to foreigners' activities (f=4). Content analysis results for the additional activities theme are described as follows:

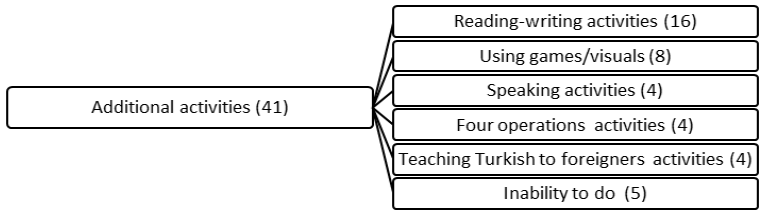

Figure 3. Codes for the theme of "additional activities".

As shown in Figure 3, the additional activities of teachers are mostly activities related to Turkish teaching. As a matter of fact, the vast majority of teachers indicated that they focused on reading-writing activities. Speaking activities and Turkish teaching activities for foreigners also constituted language teaching activities. One of the teachers' statements on this subject is as follows:
"When a foreign student comes, I first do a reading study to learn his/her level. For example, I teach 4th grade this year. My Iraqi student, who had just joined my class, was illiterate in any language. We taught literacy through the activities of 1st-grade teachers with the letter and syllabic studies by conducting the IYEP (Education Program in Primary Schools) process." (T10)
Apart from communication skills such as reading, writing, and speaking, it was seen that four operations teaching which formed the basis of mathematics were tried to be given by teachers as additional activities. Teachers stated that they did these activities by using games and visuals. Some of the teachers mentioned that they could not do additional activities for reasons such as the overcrowding of classes, the intensity of teaching programs, and the lack of knowledge about what activities they could do. One of the teachers' own statements on this subject is as follows:
"My classes are too crowded. I have one in my class, but there are dozens of refugee students in other classes. I can't give them a separate activity. Also, I don't have information on the subject. (...) I can't give to them any benefit. There are very smart children among them, but we cannot do anything for them." (T26)

2.4 Experienced problems

In the study, teachers mentioned the problems they experienced when expressing their general views and answering the question about whether they had problems with foreign students. According to the responses, the code of language/

communication problem (f=25), compliance with peers (f=14), family inability to contribute (f=8), disrupting the classroom order (f=7), behavioural disorders (f=6), learning difficulties/reluctance (f=5), absenteeism (f=5), financial difficulties (f=5) and cultural problems (f=4) were included under the theme of "Experienced problems". Content analysis results for this theme are listed in Figure 4.

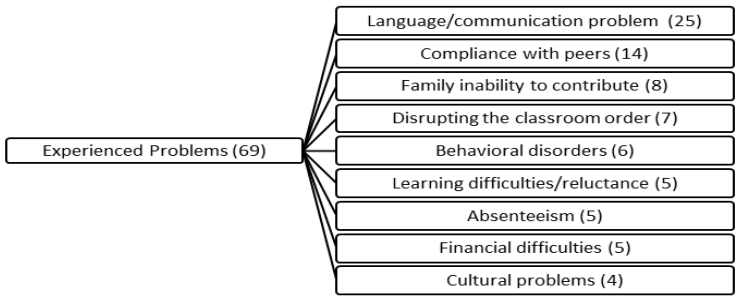

Figure 4. Codes related to the theme of the "experienced problems".

As shown in Figure 4, the first code of the experienced problem theme is the language/communication problem. Most teachers mentioned that students had communication problems caused by their inability to use Turkish. For this reason, communication became difficult, and this slowed down education to a certain extent. The teachers also mentioned that students who could not speak Turkish had problems communicating not only with their teachers, but also with their friends, so they also had problems with their peers. Teachers' own statements about the language/communication problem are as follows:

"Our biggest problem is that they do not know Turkish when they first come. As communication becomes difficult, there are failures in planning and learning process." (T18)

"Sometimes they have problems with their friends. Usually due to the language problem. (...) They are often misunderstood by students, and they experience some problems because of this situation." (T21)

The second code under the theme of experienced problems is the problem of compliance with peers and peer pressure. According to teachers, some foreign students had difficulty in agreeing with their peers, which led to adaptation problems. Students who had problems adapting to peers either became emotional or angry. These problems among peers could also cause foreign students to be excluded and subjected to peer pressure. T28 expressed these problems in the following sentences: *"When they have a problem with their friends or cannot express themselves properly, they either immediately start crying or get angry*

and fight. (...) Our students can also sometimes feel antipathy to our foreign students." Also, T26, by using the statements "Intolerance was shown to Christian students", mentioned that foreign students could also be alienated because they belonged to different religions. Furthermore, teachers stated that when students experience a problem, families were involved in it and felt the need to defend themselves. T10 stated this situation as follows: *"For example, in the slightest problem they have with their friends in class or in school, their families get involved. They're always defensive. Many of them are unable to adapt to society and feel excluded by their friends in the slightest negativity."*

Family inability to contribute students' learning process is another problem encountered by the teachers. Some of the teachers mentioned that families could not contribute to their students because they could not speak Turkish. One of the teachers expressed his thoughts on this situation as follows: *"I have difficulty with them because their families do not speak Turkish. Their parents never come to school. I can't meet the family when the children don't understand what I want or what I'm saying. If I call, they don't know any Turkish. At the beginning of the year, they put their children in school, and they haven't come in yet*." (T6)

According to teachers, other problems experienced by students include disrupting classroom order, behavioural disorders, and learning difficulties/reluctance and absenteeism. According to teachers, some of the foreign students may exhibit behavioural disorders when they cannot understand and do not comprehend lessons, which disrupts the class order and leads to a loss of time. T6 expressed this situation with the following statements: *"Their behaviours deteriorate when they can't do their studies and when they don't understand the lesson. They remain unconcerned, engaging in different events. This also distracts other students."* In addition, according to teachers, cultural problems that students experience also make it difficult for them to learn. T12 explained this situation with the following sentences: *"Cultural differences make it difficult to learn. It seems that the education system in their country is very different from ours."* Finally, it is indicated by teachers that financial difficulties experienced by the students were among the problems under this theme. Teachers mentioned that many of their foreign students were in very poor financial condition and therefore had problems with the supply of their educational needs, even nutrition. One of the teachers' own statements on this subject is as follows:

"Most of my foreign students, except for a few, are in poor financial condition. They can't meet their needs in any way. Often, they ask for money from their teachers. (...) Most of these students can't get any pocket money, while their other friends can do. They come without having breakfast. As a result, they either pass out in class or have a stomach-ache." (T28)

2.5 The way teachers solve problems

Another question of the research is how teachers solve their problems that they experienced with the foreign students. According to the given responses, the way teachers solve problems is gathered under the codes of using translator/body language (f=11), meeting with families (f=11), friendly approach/care (f=10), ensuring participation in different activities (f=4), allocating additional time (f=4), receiving help from school/administration/colleagues (f=4), providing financial/moral support (f=3), and raising awareness of other students (f=3). Content analysis results for this topic are as follows:

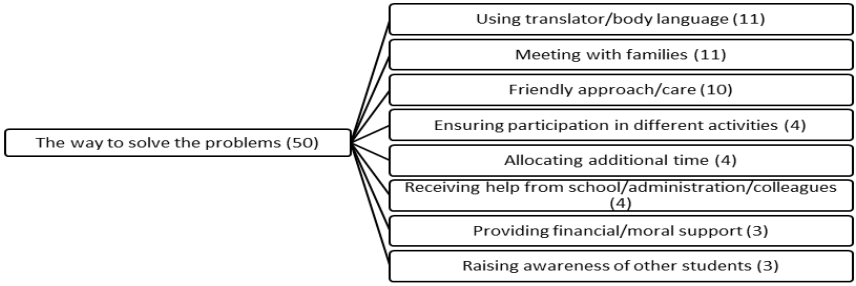

Figure 5. Codes for the theme of "ways to solve problems".

A large number of teachers have stated that they use other foreign students who speak Turkish as translators in school or class to solve the language problems that students experience. T7's statements on this issue are as follows: *"We solve problems by talking to their friends who speak the same language. They're kind of translator."* Another frequently used method is to try to cooperate with students' families. Ö28 explained this issue with the following statements: "*We also try to solve other problems, such as fighting, by trying to reach out to their families, by calling them to school. We also include their families in the solution process."* A friendly approach to student and personal interest are also among the ways teachers solve problems. T4 used the following statements on this issue: *"We talk about mistakes together. We try to be friends with them as much as possible. We listen to them and their needs."* Teachers also stated that they were targeting fewer problems by enabling foreign students to participate in different activities within the classroom and to engage in different sports and arts activities. Other than these, they mentioned that they gave them additional time to solve their problems, they received support from school/administration and colleagues, and they tried to provide financial and moral support to students. Furthermore, they stated that they tried to raise awareness of other students about foreign students. T28 addressed this issue with the following statements: *"We*

want them to communicate healthily with their friends. We want them to 'empathize' with our students, to put themselves in those students' shoes so that they understand the distress experienced by foreign students."

2.6 Teachers' suggestions for solutions

Finally, teachers were asked what suggestions they offered to solve the problems experienced by foreign students. The recommendations of the teachers were evaluated under the theme of "Suggestions for Solutions". The codes under this theme are additional course organization (f=11), the execution of separate training activities (f=8), orientation training (f=6), living in separate camps/return (f=4), family education (f=3), teacher seminars (f=3); the other suggestions comprise of the preparation of special materials (f=2), therapy for children with a tendency to violence (f=1) and the provision of financial support (f=1). The results of the content analysis for the suggestions for solutions theme are as follows:

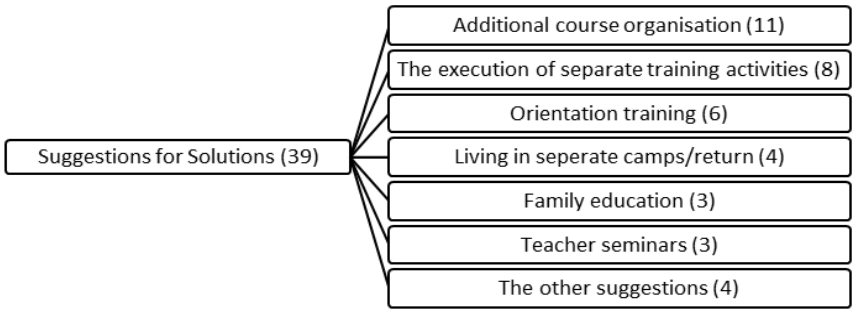

Figure 6. Codes for the theme of "suggestions for solutions".

As shown in Figure 6, the first proposal of teachers to solve the problems of foreign students is to provide additional courses. Teachers believed that foreign students should be directed to courses that specifically teach (Turkish) language before they were placed in classes. The following statements of T21 support this view: *"Language must be taught first. At the heart of the problems is the inability to understand, the inability to explain their problems."* Some teachers believed that foreign students should participate in separate educational activities with teachers of their nationality. T1's following sentences can be given as an example of this view: *"I believe it would be more beneficial for these students to be trained by their teachers who are from their countries."* A few of the teachers stated that orientation training should be given to students for adapting them to the class, society, and culture. Teachers who felt that students could not adapt

stated that foreigners should live in separate camps or return to their countries. T12 expressed his views on this issue using the following statements: *"No country has allowed the free movement of refugees in public. They must live in separate camps. Health, education and life needs should be provided there."* Teachers also stated that the families of foreign students should be made aware by receiving training about the problems of their children and how to solve these problems. Other than these, teachers indicated that they should be equipped with the necessary knowledge about how to approach and provide a healthy education process for these students with the help of seminars. Other recommendations of teachers included preparing special materials for foreign students, organizing therapies for foreign students who were prone to violence, and providing financial support to these students and their families. Finally, T16 mentioned the need to create an environment of love, respect, team spirit, and empathy between students, to ensure that students learn by doing, to value students, to share with them, to emphasize universal values in solving problems with foreign students. The teacher's own statements are as follows:

"Each child is a flower of a different colour, and by holding hands, they turn the world into a beautiful garden. In addition to telling students about the importance of being able to respect and empathize in personal relations, we must ensure that they learn by living with each other. We (parent-student-teacher) should share our knowledge and love with students through various activities (games, drama, social activities, excursions, etc.)." (T16)

"People who do not speak the same language, but share the same feelings, can understand each other. Based on this phrase, teachers play a big role in circumventing the adaptation process. After you can give the bond of love and team spirit between the children, the solution comes spontaneously. It is necessary to make people feel that individual differences are richness and understand the meaning of universal values (every child likes to play, every child laughs when they are happy, etc.)." (T16)

3 Discussion

In this study, which aims to identify the problems that primary and secondary school teachers experience with foreign students and suggestions for solutions to address these problems, the opinions of the teachers were evaluated under the themes of positive opinions about foreign students, the level of achievement of outcomes, additional activities, experienced problems, the way teachers solve problems, and teachers' suggestions for solutions.

The positive views of teachers who express opinions about foreign students within the scope of the research constitute the adaption to the classroom, the ability to speak Turkish well, and success in courses. According to some teachers, the adaption to the classroom, the ability to speak Turkish well and

success in the courses, as well as, the time when students arrive in Turkey, the gender and nationality can also be decisive or cause differences. As for the ability to achieve course outcomes with students, teachers similarly mentioned that the status of achieving outcomes varies depending on the student's status and class level. With the increase in the number of foreign students in Turkey, the studies on these students have increased in recent years (Akarsu, 2018; Ersoy & Turan, 2019; Sarıahmetoğlu, 2019; Sarıer, 2020; Kırılmaz & Öntaş, 2020). But it seems that the studies in the literature focus on the general problems and suggestions for solutions of students, without focusing on different variables in a general sense. Based on the finding of this study, it can be said that further studies taking into account different variables are also needed. In other words, it is possible to say that there is a need for studies to shed light on the problems foreign students are having and the solution proposals for these problems by considering the different variables, such as the students time of arrival into the country, gender, courses they are successful, whether they are in the intermediate class, or what nationality they have.

Some of the teachers who stated that foreign students in the class are adapting to the class mentioned that the most important factor in adaptation to the classroom and success is the students' knowledge of Turkish. In the theme of achievement of outcomes, teachers who expressed a positive opinion considered the fact that students' knowledge of Turkish language is as a prerequisite for success. In parallel with this situation, the opinion of teachers is that speaking Turkish well is important for the achievement of course outcomes with foreign students, on the contrary, it was among the opinions of teachers that the biggest reason for the inability to achieve outcomes was communication problems and deficiencies in knowing Turkish. Also, in the theme of problems with foreign students, the language/communication problem was mentioned by most of the teachers. Many studies are also found in the literature on the importance of language in the conduct of educational activities with foreign students and the problem of language and communication they experience (Chrzanowska & Jachimczak, 2018; Momtselidze, 2020; Orłowska, 2019). For example, Akarsu (2018), in his study on Turkish courses with foreign students in secondary school, stated that one of the most important factors in achieving success in education with foreign students is the use of communication tools. One of the strongest feelings that people need is the ability to express themselves, and language knowledge plays a key role in fulfilling these missions. Again, Eren (2019) stated that the language problem occupies a large place among the educational problems of immigrant children in Turkey from the point of view of both students and parents. Sarıahmetoğlu (2019) also emphasized in his research that the most important problem in classrooms with foreign students is that they do not know Turkish. At the beginning of the problems, the language problem causes teachers to give a

separate place to teaching Turkish in the additional activities they organize. As a matter of fact, in the theme of additional activities in this study, teachers listed their activities as writing-reading activities, using games/visuals, speaking activities, four operations, and teaching Turkish to foreigners. As can be seen, the additional activities of teachers are mostly activities related to language teaching. The vast majority of teachers indicate that they focus on writing-reading activities while speaking activities and teaching Turkish to foreigners also constitute activities aimed at teaching the language. Similar studies have shown that language teaching to foreign students has a great place in the literature (Akarsu, 2018; Baldık, 2018; Bánhegyi & Nagy, 2019; Biçer & Kılıç, 2017; Büyükikiz & Çangal, 2016; Derderian-Aghajanian & Wang, 2012; Ereş, 2016; Sinkkonen & Kyttälä, 2014). All these studies show that the first problems of foreign students that need to be solved are language and communication problems.

Another problem that teachers experience with foreign students is that they have communication problems not only with the student but also with the family. Because some parents do not speak Turkish, there are communication problems with parents as well as with students, and the inability of the family to contribute to students is a trouble for teachers. When students experience a problem, families are involved in it and feel the need to defend themselves, which are also among the problems. In many similar studies, communication problems with parents are mentioned, and all these studies show that parents are as important as students in teaching foreign students and that parents' language skills are critical in terms of informing parents and conducting the process with school-family cooperation (Akarsu, 2018; Eren, 2019, Dryden-Peterson, 2018; Hajisoteriou & Angelides, 2016; Johns, 2001; Şimşir & Dilmaç, 2018).

In addition to language problems or communication problems, teachers have mentioned that foreign students also have some difficulties in adapting to peers and may be subject to peer pressure. According to teachers, foreign students may have difficulty agreeing with their peers, which leads to adaptation problems. Students who have problems adapting to peers either become emotional or angry. These problems among peers can also cause foreign students to be alienated and subjected to peer pressure. Foreign students of different cultures and religions may be subject to pressure and exclusion by other students. Peer influence is also mentioned by other studies in literature (Pong & Hao, 2007; Rumbaut, 2005; St-Hilaire, 2002). Şimşir and Dilmaç (2018) also noted that since foreign students have problems communicating with their Turkish friends, problems such as the inability of Turkish students to understand their foreign friends and the reluctance to communicate with their foreign friends occur. Ersoy and Turan (2019) also mentioned that foreign students experience problems such as absenteeism and insensitivity to academic success due to being ignored by

teachers or facing stigmatism and judgmental attitudes by their friends. In our study, other problems experienced by students include problems such as disrupting classroom order, behavioural disorders, learning difficulties/ reluctance, and absenteeism, which are similar to the findings of Ersoy and Turan (2019). These adaptation problems between students make it difficult for them to understand each other, which can lay the groundwork for deep divisions and can also cause students to experience different problems such as disrupting classroom order, behavioural disorders, learning difficulties, or reluctance and absenteeism. For this reason, it is of great importance to create environments where students can coexist in harmony with each other. As a matter of fact, Palaz, Çepni and Kılcan (2019) found that students who made friendships with foreign students had more positive attitudes towards these people than students who did not have foreign friends. It is not enough for students to know each other just because they are in the same classroom environment, it is also necessary to organize activities in which they can get to know each other more closely and become friends.

Another problem experienced by foreign students was expressed by teachers as financial difficulties. Teachers have mentioned that many of their foreign students are in very poor financial condition and therefore have problems with cleaning, providing school supplies, even nutrition. Different studies also show that students are experiencing financial difficulties that cannot meet their basic requirements, and this is reflected in educational activities (Atkinson, 2006; Gonzales, 2010; Güngör & Şenel, 2018; Sarıer, 2020; Sarıtaş, Şahin, & Çatalbaş, 2016; Singer & Paulson, 2004). It is difficult to expect students to succeed by adapting to the school and classroom environment unless their basic needs are met. For this reason, it is possible to say that in schools, first of all, studies should be carried out to ensure the basic needs of students.

Teachers noted that another the main problem experienced by foreign students is caused by cultural differences. According to teachers, students may be alienated because they belong to different cultural structures and religions, or they may have difficulty adapting to the culture they have just come from. Problems experienced due to cultural differences are among the main problems highlighted in many different studies (Atkinson, 2006; Ponizovskiy, 2016). In one of these studies, Güngör and Şenel (2018) mentioned that students and their parents had difficulty adapting to Turkish traditions and customs and this situation was reflected in their educational activities. Again, Polat (2012) stated that the reflection of cultural differences in educational activities can cause some problems. According to the results of our study and similar studies, cultural problems are also factors that prepare the basis for adaptation problems, peer-to-peer conflicts, reluctance in learning, and absenteeism. For this reason, it is of great importance that foreign students must not be alienated because of their

culture, they must not be excluded by other students, and they must primarily be helped to ensure their adaptation and integration into culture and school through activities.

When teachers were asked what they were doing to solve their problems, many of them stated that they used other foreign students who spoke Turkish at school or in class as translators. In the work of Yenilmez and Çöplü (2019) and Güngör and Şenel (2018), it is also seen that teachers emphasize the need to use or employ translators. Another often used method is to try to cooperate with students' families. As mentioned earlier, ensuring school-family cooperation plays an important role in the conduct of educational activities, and this also applies to foreign students. For this reason, teachers' efforts to communicate with the family have a critical value in terms of solving problems. Another solution of teachers was expressed as a friendly approach to students and a one-to-one interest. Teachers also stated that they aimed to have fewer problems by enabling foreign students to participate in different activities within the classroom and to focus on different sports and arts activities. This can also help students avoid problems caused by their cultural differences. Other solutions of teachers include giving students additional time to solve their problems, providing support by the school/administration and colleagues, trying to provide financial and moral support to students, and trying to raise other students' awareness on foreign students. As can be seen, teachers are trying to implement solutions that are often mentioned in the literature to minimize the problems experienced by foreign students. In this context, in terms of both conducting the teaching process more healthily and being more beneficial to foreign students, it is possible to say that it will be important for teachers who have foreign students in their class to meet at certain time intervals and share these solutions with each other and discuss their proposals.

When teachers were asked what suggestions they had for solving the problems of foreign students, it was determined that their first suggestions were to provide additional courses. Teachers believe that foreign students should be directed to courses that specifically teach language before attending classes. In the literature, there are many studies indicating that additional courses, especially for language teaching, should be given to foreign students (Bulut, Kanat-Soysal, & Gülçiçek, 2018; Sarıtaş, Şahin, & Çatalbaş, 2016; Şimşir & Dilmaç, 2018; Yenilmez & Çöplü, 2019). Consideration and implementation of this proposal are of great importance in solving the communication problems of students and parents indirectly. A few of the teachers stated that orientation training is needed in order for foreign students to adapt to class, society, and culture. Teachers who felt that students could not adapt stated that foreigners should live in separate camps or return to their countries. Some teachers believe that foreign students should participate in separate educational activities with teachers of their nationality.

Teachers also stated that the families of foreign students should be made aware by receiving training and teachers indicated that they should be equipped with the necessary knowledge about how to approach and provide a healthy education process for these students with the help of seminars. As a matter of fact, under the theme of additional activities in the study, some of the teachers mentioned that they could not do additional activities for reasons such as the overcrowding of classes, the intensity of the curriculum, and the lack of knowledge about what kind of activities they could do. This indicates that some teachers are unaware of what kind of activities they can carry out for these students and their teaching process. Bulut, Kanat-Soysal, and Gülçiçek (2018) also mentioned the necessity of providing in-service courses to teachers as a result of their work but emphasized that these courses can be useful by planning them with long-term consideration and repeating them at certain intervals. Other recommendations of teachers include preparing special materials for foreign students, organizing therapies for foreign students who are prone to violence, and providing financial support to these students and their families. Finally, there are teachers who talk about the need to create an environment of love, respect, team spirit, and empathy between students in solving problems with foreign students. Aykırı (2017), and Kırılmaz and Öntaş (2020) also found that teachers attach importance to empathy, love, and inclusion of the student in the social climate of the class in communicating with foreign students.

Conclusion

This study was conducted to identify the problems that primary and secondary school teachers experience with foreign students and suggestions for solutions to address these problems. Most basic problem experienced by foreign students is indicated as language problem. Language problem also cause the problems of adaptation to school, teacher and classmates. Especially the students whose parents did not know Turkish experience these problems more than others because of the lack of support from their parents. The majority of the teachers mentioned that they could not reach the achievements in the education programs with these students, and they stated that they included additional activities related to reading and writing. Conducting orientations programs, language and literacy courses, family education (especially language teaching to families), providing therapy for children who had a tendency to violence, providing a separate education program for foreign students and providing training by teachers who were their own citizens in separate classes were among the proposed solution. Based on the results obtained throughout the study, it is possible to say that taking into account the given recommendations can contribute to the solution of the problems of foreign students. This study is limited to 29 primary and secondary school teachers who had at least one foreign

student in their class in one of the provinces of Middle Black Sea Region of Turkey. Further research can be conducted in different context to shed light on different problems of foreign students experience and proposed solutions to these problems.

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An Investigation of the Relationship between Prospective Teachers' Self-Management and Self-Control Skills, Metacognition and E-Mobile Learning Readiness Perceptions

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Abstract:
Introduction: This study aims to investigate the relationship between prospective teachers' self-management and self-control skills, metacognition, and e-mobile learning readiness perceptions.
Methods: This study adopted a procedural model that was relational screening in nature. This study was conducted with 303 prospective teachers who attended Primary School Classroom Teaching, Primary School Science Teaching, Pre-school Teaching, and Psychological Counseling and Guidance departments in a State University Education Faculty in Turkey. In this study the "Self-control and self-management scale", the "Metacognition scale" and the "E-Mobile learning readiness scale" were used as data collection tools. It was determined that the data collection tools used in the study were valid and reliable.
Results: According to the results of the study, mobile learning readiness perception is positively affected by metacognition. Metacognition is positively affected by Self-management and Self-control Skills. In the study, the effects of e-mobile learning readiness perceptions on both metacognition and self-management and self-control skills were discussed in accordance with the proposed model.
Discussion: The aim of this study is to determine the relationships between the variables of prospective teachers' self-management and self-control skills, metacognition and e-mobile learning readiness perceptions. Four hypotheses in the proposed model were discussed according to the literature.

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Limitations: This study was conducted only with the participants consisting of teacher candidates at a state university in Turkey. However, the participants of the research can be expanded with different teaching areas of higher education.
Conclusions: Prospective teachers' self-regulation, self-assessment and control skills positively affect their metacognition skills. The metacognition skill of prospective teachers has a positive effect on mobile learning readiness perception.

Key words: mobile learning, metacognition, self-management, self-control.

Introduction

Teachers could assign learners some tasks, projects or research topics to support their learning. While some of these tasks which the learners are expected to fulfill are quite simple, some are seen complicated. The term complicated is actually related to the design of these tasks, not to the level of difficulty. An individual who encounters complicated tasks actively uses various cognitive and metacognitive processes to perform these tasks as they encounter multiple goals (Perry et al., 2002). To perform a complicated task, the individual needs to be aware of the task, analyze the aspects of the goal, collect information about the difficulties encountered, and organize the documents. In such a process, the individual is expected to think deeply in detail and use problem-solving skills (Flavell, 1979). Fulfilling complicated tasks formed by the combination of various goals requires individuals to have self-awareness (Pressley, 1995; Winne, 1995), to motivate themselves by interpreting knowledge in this process (Wang & Palincsar, 1989; Winne,1995, p.72), and to have a willpower at the end of the process in order to reach the goal (Corno, 1992). In this regard, the individuals use not only their metacognitive skills, but also their self-control and self-management skills.

In today's world, individuals inevitably consult several learning sources and use technology-based mobile learning sources to fulfill a complicated task. In a task or project involving complicated problem solving, they need a technological environment as well as metacognitive and self-regulated skills (Azevedo, 2005). In this regard, Azevedo et al. (2004) investigated the differences in conceptual knowledge gains of university students while using hypermedia environments to learn about complicated science topics such as circulating system. The materials accessed by the students included videos, photographs, diagrams, and texts. Students accessed these materials using technological devices. Three different learning goals about the circulating system were identified and the students were divided into three groups. Each group was given some different complicated tasks. All three groups were asked to think aloud while using the materials in the

hyper environment. Results showed that the students in the third group who had couch support could present more holistic and complicated mental examples about the circulatory system by focusing on topics such as using the strategies and monitoring the development. The students were found to fulfill a complicated task more easily in a process where a technology-supported learning environment existed, and self-control and management interacted with each other. In this context, it is highly important to explain how much students' e-mobile learning readiness, a new education paradigm, predicts metacognition, self-regulation and self-control skills in the light of a model to be established between self-management and self-control, metacognition and e-mobile learning readiness. In this regard, the study aims to identify the relationship between prospective teachers' self-management and self-control skills, metacognition and e-mobile learning readiness perceptions.

In the light of the literature, a model proposal was created according to the relationship between self-management and self-control skills, metacognition and e-mobile learning readiness perceptions variables. The relationships among the variables are explained under the literature review section. From this point on, the study comprises Literature Review and Model, Method, Results, Discussion, Conclusion, Recommendations, Limitations, and Future Research sections.

1 Literature review and model

1.1 Self-control and self-management (SCMS)

Due to the nature of learning, individuals' self-control and self-management skills increase their performance to achieve the things they want. Self-directed learning is regarded as learners' individual decisions about how and what to learn, how to consult outer sources or whether or not to consult them. Self-management is a process where thoughts, emotions, and behaviors are stimulated to reach goals and maintain their continuity (Zimmerman, 2002). According to Bandura (2009), self-management is defined as setting goals and using the required efforts and sources to reach these goals. In clinical psychology, self-management is explained on the basis of self-control skills (Cautela, 1969; as cited in Neck & Houghton, 2006). Learners who have self-regulation including self-control and self-management, take active roles in receiving, transforming, organizing information, reaching academic goals, and monitoring and evaluating self-efficacy perceptions (Ben-Eliyahu, 2019). According to the studies (Boekaerts & Corno, 2005; Pintrich, 2004), the definition of self-regulation generally includes the capability to observe and devise one's learning actively using various behavioral and metacognitive strategies, which could involve resource management, making effort, data processing and organizing, and self-testing. Self-regulated learning abilities are also reported to be highly important for achievement in different learning contexts (Lehmann et al., 2014; Pintrich,

1995). Self-regulation skill is affected by knowledge, motivation, and willpower. To have self-regulation, an individual is initially expected to know himself/herself. Individuals with high self-regulation know themselves (Pressley, 1995; Winne, 1995). As they know themselves, they can motivate themselves by interpreting their knowledge to reach the goals they set for the future (Wang & Palincsar, 1989; Winne, 1995). An individual who motivates himself/herself needs to maintain a task to reach a specific goal and have strong goodwill to observe the results (Corno, 1992). For instance, an individual who knows how to deal with the problems he/she encounters in the process uses his/her willpower correctly. He/she can also control himself/herself on how to behave in cases of interesting things or problems in the process of reaching a goal (Snow et al. 1996). On the other hand, Pintrich (2004) also highlights the motivation component in self-regulated learning and states that it should be paired with behavior, cognition, and context. According to Pintrich (2004), self-regulation is an inseparable part of an individual's personal development and is defined as "an active and constructive process where students identify their own learning goals, try to regulate their cognition, motivation, and behaviors, and is guided and limited by their goals and contextual features in their environment". Like other self-regulation models, Pintrich's (2004) model is also composed of four phases a) forethought planning and activation, b) monitoring, c) control of the context, self, and task, and d) reaction and reflection. Similarly, Zimmerman's (2008) self-regulated model also includes forethought, planning, and activation that stimulate students' motivation such as interest and self-efficacy. In such a process, self-regulated learning involves the cognitive, metacognitive, motivational and emotional aspects of learning.

On the other hand, things to do in order to become a self-directed learner, an important factor in self-regulation, are reported by Gibbons (2002) as follows:

- developing skills and processes to enhance individual learning: setting goals, planning, and evaluation,
- enabling to control learning: improving viewpoints, attitudes, and entrepreneurship,
- independent thought: learning to analyze, finalize, discuss, and create something,
- managing time effectively,
- designing and completing plans,
- designing and completing learning activities.

Learners who are engaged in these activities will form today's independent learner profile. Therefore, a teacher who has self-regulation skills will have the performance of controlling and managing complicated learning activities and provide students with the necessary guided learning support on this issue. It is expected that self-regulation skills, an important component of metacognition,

exist in the education of individuals learning how to learn. In addition, self-regulated learning (SRL) is considered to be a critical component of successful online education (Hill & Hannafin, 1997). On the other hand, aspects of self-regulation in Lehmann et al. (2014, p. 314) are investigated within three fundamental structures which include the cognitive aspects consisting of structural (specific knowledge and strategic knowledge) and procedural (knowledge process and goal framework) components; metacognition aspect consisting of structural (metacognition and task knowledge) and procedural (planning, reflection and evaluation) components; and motivational aspect consisting of structural (interest, belief, ability) and procedural (strategies about emotional processes and willpower) components. If it is acknowledged that these aspects are in constant interaction with each other, relationships between metacognitive processes and self-regulation and management processes will become clearer. Based on this point, the first, second and third hypotheses (H1, H2 and H3) of the research are as follows:

H1 = As the prospective teachers' self-adjustment skills increase, their metacognition skills increase significantly.

H2 = As the prospective teachers' self-assessment skills increase, their metacognition skills increase significantly.

H3 = As the prospective teachers' control skills increase, their metacognition skills increase significantly.

1.2 Metacognition

Metacognition is a process in which higher-order thinking and skills are encountered based on the fact that individuals take responsibility for their own learning. Metacognition, which is encountered as the process of learning to learn and learning to think, is an important component of the learner's awareness of his/her own learning process. Metacognitive skills have strategic importance for both problem-solving and self-regulation and control. Metacognition is a structure where planning, practice, evaluation, and review get involved in learning. The metacognition process includes an individual's process of awareness, knowledge, and control about self, and the knowledge and control about the learning process. Flavell (1979) shapes metacognition, which is considered as cognition about cognition, on two fundamental functions as the control of cognition and reflection of cognition; the metacognition process becomes meaningful with metacognitive knowledge and skills.

Metacognitive knowledge in such a process is the knowledge about an individual who solves problems or learns about self and his/her learning strategies. As to the metacognitive skills, it is related to the regulation of cognition that involves an individual's regulation and awareness of his/her own cognitive system and function (Fernandez-Duque et al., 2000a). Positive effects of learners' being

equipped with metacognition-related knowledge, skills, and attitudes will be reflected in their performance in their future life. Teachers who have metacognitive skills make positive contributions to their students in terms of providing them with necessary guided learning support. Metacognitive skills, which will be covered as an important factor within the 21st-century skills, will be encountered as an important factor in raising individuals who improve themselves.

According to Flavell (1979), described as "thinking about thinking" as well, metacognition is reported to be well-known as an internal psychological process that is required for effective learning and problem solving. In such a structure, prospective teachers need to have metacognitive skills such as awareness about what they are doing, organizing their actions, and evaluating themselves (Bellon et al., 2019). On the other hand, Flavell (1979) was the first one to introduce the term metacognition as a more general concept that covers the monitoring and regulation of cognitive performance. In the study of Vo et al. (2014) metacognition is reported to involve the capacity to estimate one's cognitive knowledge and ability. Bryce et al. (2015) state metacognition as the way people monitor, and control their cognition on task. According to Flavell (1979), there is a big difference between metacognitive monitoring and control. Metacognition is related to the ideas, beliefs, knowledge and theories possessed by a learner about how to regulate processes related to the goals and how to optimize outcomes; metacognitive skills, on the other hand, are self-regulatory behaviors performed by an individual when he/she is engaged in learning, which helps to control thinking or learning (Flavell 1979, Prins et al., 2006; Sandi-Urena et al., 2010). The process of metacognition requires metacognitive knowledge and skills. Metacognitive knowledge about cognition is reported to have procedural (how), declarative (what), and conditional (why and when) ideas (Zohar & Barzilai, 2013). On the other hand, metacognitive skills involve several models (some relevant constructs like self-regulation and metacognitive awareness); each model has insignificant theory-based variations and different terminologies. Metacognitive abilities are top-level managing abilities; some examples include monitoring, duty analysis, checking, reflection, devising, and evaluation of achievement. The procedural side of metacognition for control, prediction, and self-assessment is reflected by these skills. The term metacognition used in this study represents an overarching term. It involves some different names generally used such as "self-regulated learning", "thinking skills", and "learning to learn". While some other skills are also known in the business sector and referred as "21st-Century Skills" as Voogt and Roblin (2012) state, when compared to high-level skills, they constitute a more widespread framework of skills. Metacognitive skills are involved in the 21st-century skills. Metacognition is the process of learning to learn. Studies demonstrate the increasing importance of

metacognition for the improvement in learning and teaching. For instance, while Tarricone (2011; as cited in Haukås et al., 2018, p. 1) reports that metacognition is a fundamental factor for learning, Hattie (2012; as cited in Haukås et al., 2018, p. 1) claims that teachers who prioritize the metacognitive process and skills demonstrate better performance in terms of supporting their own development and the development of their students. On the other hand, recent studies emphasize that metacognitive skills (Fernandez-Duque et al., 2000b; Garner, 2009) and self-regulation (Hofmann et al., 2012) play an important role in learners' executive functions. There are three important research fields where metacognition plays important roles. These include cognitive and experimental psychology, higher-order thinking process, and education psychology, which have important effects on higher-order thinking processes and self-regulation. In addition, metacognitive processes and skills also take place as an important component in the studies on neuropsychology and brain (Keulers et al., 2019). Studies in this field also concluded that the effective use of metacognitive skills increases the learner's performance in learning.

Metacognitive processes and skills are structures that involve one's knowledge and control about self as well as the knowledge and control of the learning process. Definitions of metacognition are generally interpreted in two processes called one's knowledge about self and regulation of cognitive activities (Costa, 1984; Flavell, 1979; Mevarech et al., 2006). Metacognitive knowledge, metacognitive experiences (Flavell, 1979), and metacognitive skills (Efklides, 2006) form the three aspects of metacognition. The definitions and explanations made under the title of Metacognition are tried to be summarized in Figure 1.

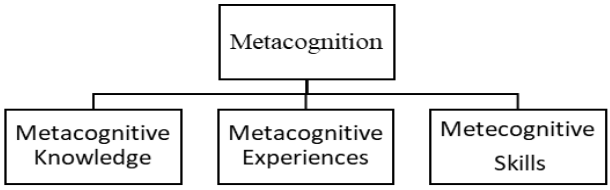

Figure 1. Elements of metacognition.

According to Figure 1, metacognitive knowledge involves declarative knowledge about the individual, task, and strategies. As to metacognitive skills, they refer to the procedures and behaviors used for regulating cognitive activities. On the other hand, the metacognitive experience, which is also called self-initiated metacognition, is defined as any conscious cognitive and affective experiences emerging in all kinds of task processes (Flavell, 1979). In this structure, the individual owns the learning responsibility. As such, metacognition involves the

learner's abilities in predicting, planning, monitoring, and evaluating their own mental activities. In such a process, individuals have the skills of evaluating what they know and do not know, controlling their own learning processes, planning, organizing, evaluating their own learning, and choosing and using learning strategies appropriate for them among several other strategies. For this reason, it is highly probable that teachers who have these skills would better provide their students with required guided learning support and organize the teaching process.

Teachers who have the planning, organization and evaluation skills of metacognition are expected to have a positive approach towards the e-mobile learning required by the 21st century. Hence, enterprising learners who plan, organize, and evaluate their own learning processes would be open to new technologies and renew themselves according to the context. Hence, Mohd Asraf and Supian (2017) investigated the relationship between mobile learning and metacognition in 21 undergraduate students and found that a larger vocabulary formed with the widespread use of cell phones contributed to the increase in learners' metacognitive skills. In this context, the fourth hypothesis (H4) of the research is as follows:

H4 = As the prospective teachers' metacognition skills increase, their E-MLR levels increase significantly.

1.3 E-Mobile learning readiness (E-MLR)

Mobile learning is identified as the spread of learning resources and services to learners regardless of time and place via any mobile device connected to internet (Hashemi et al., 2011). With the increase in mobile applications, almost everyone's using mobile learning has become common by connecting to wireless internet. Features of cell phones such as easy access to various materials that can be used in educational environments for academic purposes (e.g. a camera, sound, a photograph, a computer, a calculator) are highly effective for learning (Laurillard, 2009). However, before adopting a mobile learning strategy, a formal learning method and strategy, individuals' readiness level and attitudes towards this learning strategy need to be evaluated. There, it forms a new education paradigm for this new source and way of learning for students, who are the stakeholders of mobile learning (Alhassan, 2016). In addition to having a mobile tool with the required functions, students are expected to be psychologically ready to learn and be motivated to make learning more fruitful. An individual's enhancing readiness for learning by motivating himself/herself for learning in a long-time period and doing it through mobile learning are related to having a high level of readiness for mobile learning (Titova &Avramenko, 2013). In this regard, studies on mobile learning readiness have identified several variables that affect readiness for learning. Nwagwu and

Odetumibi (2011) state that these variables include education level, Trifonova et al. (2006) support that they also involve gender, and MacCallum and Jeffrey (2009) present the age factor. Studies with multiple variables on mobile learning have investigated applications that affect mobile learning like technological foundation, needs of student, and pedagogical gains (Alzaza & Yaakub, 2011; Cheung et al., 2011). An analysis of the related studies reported that education level, gender, and age caused significant differences in the mobile learning level. At this point, the pedagogical benefits of mobile learning and the positive effects of applications have also been reported. In addition, the presence of self-regulation and metacognition in today's e-mobile technologies as components to be benefited in the process of control and management is something expected.

On the other hand, a teacher who is a cognitive coach to make today's students independent learners is a teacher who is open to mobile learning processes, an expert on higher-order processes and skills such as metacognition, and is competent in self-management and control processes. Identification of prospective teachers' status about these issues is of importance in terms of increasing the nature of the guided learning support to be provided to them. For these reasons, the notion of this study is to find out what kinds of relationships exist between metacognition and e-mobile learning readiness perception and self-management and self-control skills. In line with this, the main purpose of the present study is to investigate the relationships between "self-management and self-control skills", "metacognitive skills" and "e-mobile learning readiness perceptions" among prospective teachers. In line with this purpose, the study sought answers to hypotheses of the proposed structural model (see by Figure 2).

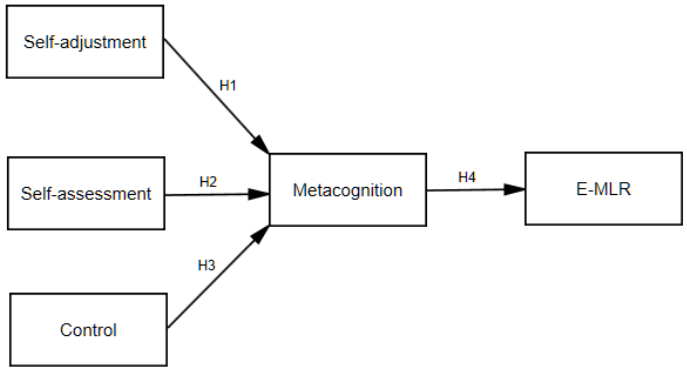

Figure 2. The proposed structural model.

In this model, the relationships between the self-adjustment, self-assessment, control, metacognition and E-MLER as shown by one-way arrows form the hypotheses for the study (see Figure 2). These hypotheses are as follows:
H1= As the prospective teachers' self-adjustment skills increase, their metacognition skills increase significantly.
H2= As the prospective teachers' self-assessment skills increase, their metacognition skills increase significantly.
H3 = As the prospective teachers' control skills increase, their metacognition skills increase significantly.
H4= As the prospective teachers' metacognition skills increase, their E-MLR levels increase significantly.
In line with the purpose of this research, the above hypotheses will be tested.

2 Results

2.1 Research design

This study adopted a procedural model that was relational screening in nature. Procedural studies provide three types of information. The first of them is the predictability of the behavior pattern taken as a criterion. The second is the indicators of the behavior pattern taken as a criterion. The third and last is the procedural validity of the test or tests related to the behavior pattern taken as a criterion (Borg & Gall, 1989). In this regard, the hypotheses developed to determine the relationship among prospective teachers' self-adjustment, self-assessment, control, metacognition skills and E-MLR are tested. From this point forth, it is aimed to reach all three types of information presented by the procedural research model. Schematic display of the behavior patterns taken as criteria and indicators of the behavior patterns taken as criteria in this study is given in Figure 1. An analysis of Figure 2 shows that in the first aspect of the study, E-MLR was taken as criteria. In other words, the dependent variables and the predictive variables were identified as metacognition. In the second aspect of the study, metacognitive skills were taken as criteria behavior patterns. In other words, they were taken as dependent variables. The predictive variables were identified as self-adjustment, self-assessment, and control aspects of self-management and self-control skills.

2.2 Participants

The participants of the study were prospective teachers from the Primary School Science Teaching, Psychological Counselling and Guidance, Classroom Teaching, and Pre-school Teaching Departments of State University Education faculty in the east Anatolia of Turkey, 2018-2019 academic year. The participants consisted of 303 prospective teachers from the departments identified by using improbable cluster sampling method. Distribution of the

sample by gender showed that 180 students (59.4%) were females, 120 students (39.6) were males, and 3 (1%) did not indicate gender. Distribution of prospective teachers by gender showed that there were 121 students in the Psychological Counseling and Guidance Department (39.9%), 58 students (19.1%) in the Pre-school Teaching Department, 61(20,1%) students in the Science Teaching Department, and 63 (20.8%) students in the Classroom Teaching Department. As to having participated in any training about mobile learning variable, 203 (67%) students reported they had participated in no training about mobile learning, 35 (11.6%) reported to have had training about mobile learning, and 35 (11.6%) did not respond to this question.

2.3 Data collection tools

In order to collect data, the "Socio-demographic Form" was used to identify participants' socio-demographic features, "E-Mobile Learning Readiness Perception Scale" (E-MLR) was used to identify students' perceptions about e-mobile learning readiness, "Metacognition Scale" (MS) was used to measure their metacognition, and "Self-Control and Self-Management Skills Scale" (SCMS) was used to evaluate their self-control and self-management skills.

2.3.1 The Socio-Demographic form

The Socio-Demographic Form was developed by the researchers and utilized on the purpose of collecting information related to independent variables of the study. It was also used with the intention of describing the sample in terms of their socio-demographic characteristics. The form included 8 questions about gender, department, class level, education level of the parents, income level of the family, type of high school graduated, and having received any training about mobile learning.

2.3.2 E-Mobile Learning Readiness Perception Scale (E-MLR)

Turkish adaptation of the E-mobile Learning Readiness Perception Scale developed by Lin et al. (2016) was performed by Gökçearslan et al. (2016) with 698 undergraduate students in the spring semester of the 2015-2016 academic year. The 17-item scale with 3 sub-scales has 7 items in the first aspect Optimism factor, 6 items in the second aspect Self-efficacy factor, and 4 items in the Self-learning factor. Cronbach's Alpha coefficient of the scale that explains the 76.9% of the total variance was found .95, and the test-retest correlation coefficient was found .68.

2.3.3 Metacognition Scale (MS)

The Metacognition Scale (MS), which had KMO=.914; Barlett Sphericity test $\chi 2=1.853$ df=153 $p<.001$, was developed by Demir (2013) to identify the

metacognitive skills level of prospective teachers. The MS has three sub-scales called Evaluation, Organization, and Planning. The Cronbach's Alpha internal consistency coefficient of the whole scale was .89. An item in the "Evaluation" sub-scale was "While listening to the teacher, I question whether I understand or not"; the Cronbach's Alpha internal consistency coefficient was .87. An item in the Organization sub-scale is "I check my activities about the topic of the course"; the Cronbach's Alpha internal consistency coefficient was .65. An item in the "Planning" sub-scale is "I can create the necessary conditions to activate the goals of the course", the Cronbach's Alpha internal consistency coefficient was found .70. The three sub-scales explain 53.07% of the total variance. Confirmatory Factor Analysis and chi-square value calculated for model-data were found to be significant ($\chi 2$=151.90, df=74, p<.01). Some fit statistics calculated using the same analysis were as follows: ($\chi 2$/df)=2.05, RMSEA=0.064, RMR=0.045, GFI=0.92, AGFI=0.89, NNFI=0.91, NFI=0.87, CFI=0.93).

2.3.4 Self-Control and Self-Management Skills Scale (SCMS)
Turkish adaptation of the Self-Control and Self-Management Skills Scale developed by Mezo (2009) was performed by Ercoşkun (2016) with 1006 undergraduate students in the fall semester of the 2014-2015 academic year. The three sub-scales explained 54.09% of the total variance (KMO=.91, Bartlett's test $\chi 2$=5119.371). Chi-square value calculated for model-data fit with Confirmatory factor analysis was found to be significant. Values of the scale obtained as a result of Confirmatory factor analysis met fit indices with RMSEA=.052, NFI=.97, CFI=.98, GFI=.96, AGFI=.94, RFI=.97 values.

2.4 Instrument validity and reliability
Validity and reliability analyses of the scales used in this study (E-MLR, MS, and SCMS) were made using the data set consisting of prospective teachers. Table 1 CFA results revealed the fit index and Cronabach Alpha (α) values.

Table 1

Data collection tools fit index and internal consistency values

Scale	*(χ2/df)*	*RMSEA*	*NFI*	*CFI*	*GFI*	*AGFI*	*IFI*	*α*
E-MLR	3.113	.045	.930	.945	.940	.910	.950	.950
MS	2.761	.060	.900	.935	.930	.920	.930	.890
SCMS	2.900	.070	.930	.920	.925	.915	.910	.820

When the DFA fit values for the data collection tools are analyzed according to Table1, E-MLR fit index values: ($\chi 2$/df)=3.113, RMSEA=0.045, NFI=0.930,

CFI=0.945, GFI=0.940, AGFI=0.910, IFI=0.950. When analyzed, it was determined that the $\chi 2$/df, RMSEA, NFI, CFI, GFI, and IFI are in the acceptable fit value range. The MS fit index values: $\chi 2$/df=2.761, RMSEA=0.060, NFI=0.900, CFI=0.935, GFI=0.930, AGFI=0.920, IFI=0.910. When analyzed, the $\chi 2$/df, RMSEA, CFI, GFI, AGFI, and IFI values are an acceptable fit. The SCMS fit index values: $\chi 2$/df=2.90, RMSEA=0.070, NFI=0.930, CFI=0.920, GFI=0.925, AGFI=0.915, IFI=0.910.

The criteria accepted for fit values in the literature are given in section assumptions of model suitability in data analyses title. Accordingly, when the fit index values accepted as criteria in assumptions of instrument validity suitability are compared the model fit index values are considered to be acceptable values.

Cronbach's Alpha (α) values were analyzed for the internal consistency coefficient of the data collection tools and determined to be: Internal consistency coefficient of E-MLR (α=0.95). Cronbach's Alpha values were found (α=0.92) for the "Optimism" sub-scale, (α=0.91) for the "Self-efficacy" sub-scale, and (α=0.83) for the "Self-learning" sub-scale. Internal consistency coefficient of the MS (α=0.890). Cronbach's Alpha values of the scale in the sub-scales were (α=0.820) for the "Evaluation" sub-scale, (α=0.660) for the "Organization" sub-scale, and (α=0.780) for the "Planning" sub-scale. SCMS internal consistency coefficient (α=0.820), Cronbach's Alpha values in the sub-scales were (α=0.780) for the "Self-adjustment" sub-scale, (α=0.760) for the "Self-assessment" sub-scale, and (α=0.750) for the "Control" sub-scale. Accordingly, the data collection tools used in the research (E-MLR, MS, and SCMS) are valid and reliable.

2.5 Data analysis

2.5.1 Investigating assumptions

Missing and incorrect encodings were reviewed before analyzing the data. Then outlier analysis was carried out with a view to analyzing the CFA and Path analysis assumptions, and Mahalanobis distance larger values were excluded from the analysis. Once it was found that the data were distributed normally and the variances were homogenous, multicollinearity, variance inflation factor (VIF) and tolerance values were analyzed, results indicated no close to zero tolerance, VIF more than 5, condition index accompanied by two variances more than 0.50 and bigger than 30. The analyses were performed on 303 participants (Tabachnick & Fidell, 2001).

2.5.2. Assumptions of model suitability

Confirmatory Factor Analayzses (CFA) was applied to test the validity of the data collection tools of this study. CFA fit index values were taken as a criterion for model fit values. In the literature, acceptable lower bound and fit index values for CFA are as follows: The ratio of chi square value to degree of freedom

($\chi 2/sd.\leq 5.$), Root Mean Square Error of Approximation ($0.06\leq RMSEA\leq 0.08$), Normed Fit Index ($0.90\leq NFI$), Comparative Fit Index ($0.90\leq CFI$), Goodness of Fit Index ($0.90\leq GFI$), Adjustment Goodness of Fit Index ($0.90\leq AGFI$), and Incremental Fit Index ($0.90\leq$ IFI) (Anderson & Gerbing, 1984; Hu & Bentler, 1999; Tabachnick & Fidell, 2013). The AMOS 23 software package was used for CFA and path analysis; the SPSS 21 software package was used for dataset entry, item statistics, test statistics and correlations among constructs.

3 Results

The results section involves initially the descriptive values demonstrating the standard deviations, correlation matrixes, arithmetic means, and then path analysis results. Table 2 demonstrates the correlation matrixes, arithmetic means, and standard deviation values of the variables used in the study.

Table 2

Correlations among constructs, means, standard deviations, skewness, kurtosis, (N=303)

Constructs	*1*	*2*	*3*	*4*	*5*	*M*	*SD*	*Skewness*	*Kurtosis*
1. Control	1					22.05	4.86	-.354	-.290
2. Self-assessment	.286**	1				19.16	4.56	-.624	-.311
3. Self-adjustment	.478**	.356**	1			26.10	5,.01	-.242	-.511
4. Metacognition	.443**	.299**	.518**	1		51.52	9.70	-.653	.642
5. E-MLR	.421**	.222**	.458**	.401**	1	78.60	8.79	.052	-.389

** Correlation is significant at the 0.01 level (2-tailed)

As it is seen in Table 2, arithmetic means of the dependent variables ranged from 78.60 to 19.16, and the standard deviations ranged from 9.70 to 4.56. Table 2 shows a significant relationship in the relationships between control, self-assessment, self-adjustment, metacognition and E-MLR ($p<0.01$). The majority of the variables in Table 2 had a near medium level significant relationship with variables. Variables were not related to each other at a level to cause multiple connection problems, yet they had a medium-level significant relationship. In addition, it was determined that the kurtosis and skewness values of the variables of the proposed model, which are indicators of normal distribution, are between -1 and +1 values.

Before examining to testing the hypothesis of the proposed model, model fit values were examined. Model fit values are given in Table 3.

Table 3

Model fit indices

Fit indices	*(χ2/df)*	*RMSEA*	*NFI*	*CFI*	*GFI*	*AGFI*	*IFI*
Values	3.292	.067	.990	.993	.991	.936	.993

Accordingly, when the model fit values of the research are analyzed according to Table 3, since (χ2=19.027; df=6; p=.037) χ2/df=3.292 is less than 5, this indicates an acceptability fit. The RMSEA value (RMSEA=0.067) shows an acceptability fit. The NFI value (NFI=0.990) shows a good fit. The CFI value (CFI=0.993) shows a good fit. The GFI value (GFI=0.993) shows a good fit. The AGFI value (AGFI=0.936) shows a good fit. The IFI value (IFI=0.993) shows a good fit. When Table 3 is examined, it is understood that the fit index values of the model are good fit values. Results of the hypotheses of the proposed model are shown in Figure 3.

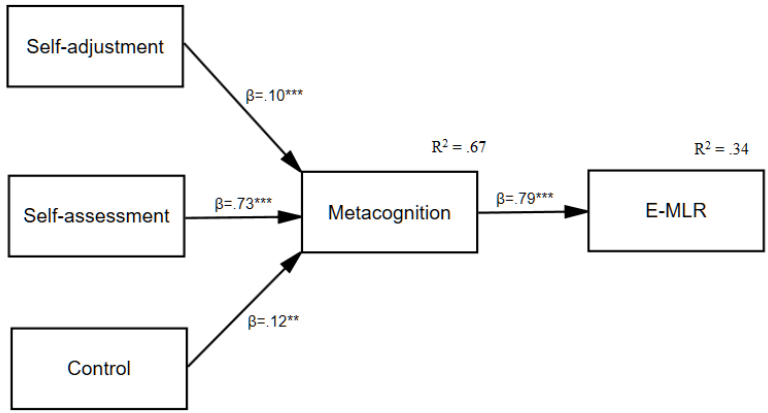

Figure 3. Representation of the standardized values of the path analysis results of the proposed model (**p< .01., ***p < .001., N =303).

Path analysis was applied to test the hypotheses established between self-adjustment, self-assessment, control, metacognition and E-MLR which are the variables of the study. Path analysis values are in table 4.

Table 4

Path analysis values

			β	*B*	*S.E*	*t*	*p*	*Hypotheses*	
Self-adjustment	→	Metacognition	.096	.174	.064	2.71	.000	H_1	Suported
Self-assessment	→	Metacognition	.732	.655	.032	20.59	.000	H_2	Suported
Control	→	Metacognition	.118	.207	.062	3.34	.007	H_3	Suported
Metacognition	→	E-MLR	.785	.488	.036	13.69	.000	H_4	Suported

B=unstandardized estimates; β=standardized estimates

According to Table 4, the self-adjustment variable (β=0.96; t=2.72; p<.001) directly and positively affects the metacognition variable. The self-assessment variable (β=0.732; t=20.59; p<.001) directly and positively affects the metacognition variable. The control variable (β=0.118; t=3.34; p< .01) directly and positively affects the metacognition variable. The metacognition variable (β=0.785; t=13.69; p<.001) directly and positively affects the E-MLR variable. In light of these results, H1, H2, H3 and H4 hypotheses are supported.
According to Figure 3, E-MLR variable explains 34% of the variance explained by the proposed model (R2=.34). The metacognition variable explains 67% of the variance according to the proposed model (R2=.67).

4 Discussion

The aim of this study is to determine the relationships between the variables of prospective teachers' self-management and self-control skills, metacognition and e-mobile learning readiness perceptions. Four hypotheses in the proposed model were discussed according to the literature (see Figure 2).
According to the results of the study, the findings obtained to test hypothesis 1 and hypothesis 3 show an increase in self-adjustment and control leads to an increase in metacognition. Planning, organization and evaluation skills of metacognition as learning to learn process are directly associated with the self-control and self-management of the individual. Hence, Zimmerman (2002) also defines self-regulation and self-management as “an individual’s own thoughts and actions planned, regulated, organized, and performed in a cyclical way in reaching the individual goals”. In this regard, the ability to monitor and control cognition is referred to as metacognition. Self-control and self-management play an effective role in this ability. Hence, metacognition has two components and as to Flavell (1979), it is defined as “thinking about thinking”. While the first component is knowledge of cognitive processes and products, the second component involves the self-regulation processes, indicating the ability to control, monitor, and evaluate cognitive processes. Cognition knowledge

includes a number of interrelated components; these are knowledge on using the strategies; metacognitive knowledge about the strategies, the person and the task; and metacognitive experience, which is the feeling about being successful or vice versa in fulfilling a task. Because metacognitive knowledge brings along the use of self-regulated strategy about the goal, these components are related. This process of self-regulation has impacts on the metacognitive knowledge, and it comprises a basis for a better metacognitive knowledge acquisition. In addition, Dinsmore et al. (2008) state that self-regulation is a significant constituent of metacognitive control processes. The analysis of students' errors also includes self-regulatory mechanisms. Hence, Lucangeli et al. (2019) have reported that there were positive relationships between self-control and self-management skills and metacognition process in terms of mathematical achievement. Similarly, Deng et al. (2019) found that self-control and awareness consecutively mediated the relationship between intellectual circulation and metacognition. The related study also showed that intellectual circulation is an important pioneer of metacognition. Džinović et al. (2019) investigated the mediative effect of self-regulation that involves the regulation of motivation styles, academic self-efficacy, and metacognition as self-regulation-related variables on the self-control. The results showed that students who had self-control skills and believe themselves in terms of meeting the requirements of the school have become more successful at school regardless of their autonomous motivation and complexity of their learning. On the other hand, the two aspects of metacognitive self-regulation include knowledge of thought processes and metacognitive skills (Veenman et al., 2006) or strategies of cognitive self-regulation (Pintrich, 1999); planning, monitoring, control, and reflection are the most commonly stated metacognitive strategies as the components of metacognition (Pintrich, 2004).

Self-adjustment and control sub-scales significantly predict the total score for metacognition. Prospective teachers' adjustment depending on the context under investigation and controlling it are closely associated with their knowledge and control about self and knowledge and control about the learning process. Džinović et al. (2019) highlighted the positive relationship between self-adjustment and control variables and metacognition. On the other hand, the metacognition process is not related only to the construction of knowledge, it is also a process associated with the management and control of knowledge and learning. Further investigations were performed about the connections that this construct has with other essential elements of the process of learning which include metacognition (Fox & Riconscente, 2008), self-learning, and self-regulated learning (Maggioni & Parkinson, 2008). There was an emphasis on the features and overlaps of self-regulation, self-regulated learning and metacognition (Lajoie, 2008; Efklides, 2008; Hofer & Sinatra, 2010) concepts.

As a matter of fact, these studies support the model that the self-adjustment and control subscales have a positive effect on metacognition.

According to the results of the study, the findings obtained to test hypothesis 2 says that self-assessment affects metacognition directly and positively. An individual's evaluating his/her own learning processes and making necessary organizations for individual learning accordingly are of great importance for individual development. Hence, Mellinger (2019) investigated the relationship between metacognition and self-assessment in a specific translation education and found that metacognition played a role in the translation task together with self-assessment. However, the fact that self-assessment does not predict metacognition significantly is a different finding. It is stated in the body of literature that self-assessment has positive effects on the development of metacognition (Siegesmund, 2017; Ibabe & Jauregizar, 2010). In a study by Ibabe and Jauregizar, (2010), it was found that an instructional design using online self-assessment feedback and self-assessment materials had a positive effect on students' academic performance and metacognition. In the study conducted by Zagyváné Szűcs (2018), it was investigated among six teacher trainers whether there is a difference between self-reflection and self-evaluation skills, which are the basic elements of self-regulation. As a result of the study, even though any generalization could not be made among the teacher trainer groups, it was determined that self-reflection and self-evaluation skills play a critical role in the professional development of teacher trainers. According to the results of the research they conducted in Roll et al. (2006), it was found that using self-assessment in the curriculum increased students' awareness of their own knowledge levels. In this context, it was determined that self-assessment made a positive contribution to metacognition.

According to the results of the study, the findings obtained to test hypothesis 4 says that metacognition affects e-mobile learning readiness perception directly and positively. The fact that individuals have self-control and self-adjustment skills in the process of learning to learn would have positive effects on their situational learning readiness perception such as connecting to new technologies, learning in the context they are in, and e-mobile learning. In some respects, mobile learning is broader; in this learning, learners are encompassed within the boundaries of educational institutions, and it has individual unstructured learning driven by curiosity and necessity (Traxler, 2010, p. 131). Hence, studies also show that self-adjustment and control sub-scales significantly predicted the e-mobile learning readiness perception scale. All the active components of active learning such as participating, questioning, experimenting, revising and exploring exist altogether; in such a process, students who have self-control and self-adjustment skills are expected to have increased e-mobile learning readiness perceptions. In e-mobile learning, learners decide on the things they know and

do not know by themselves, organize, evaluate and then perform their own learning, which is directly related to self-control and self-adjustment skills. In addition, e-mobile learning enables changes, development, and taking precautions against unexpected situations, and adapts these innovations to environments, which is also a reflection of another aspect of self-control and self-adjustment on e-mobile learning. Hence, in their study conducted with Jordanian university students, Al-Adwan et al. (2018) reported that self-management aspects were effective in relative advantage, complexity, social effect, and pleasure, and self-management aspects of learning.

In today's world, raising enterprising and independent learners depends on enabling them to improve themselves by adapting to new technologies. Mobile learning is a way of learning in which the learner can access e-learning content without being dependent on a specific place, dynamically benefit from services produced, and communicate with others. In such a process, prospective teachers' who have the learning opportunity free of time and place will have self-management and self-control skills in the lifelong learning network. Hence, prospective teachers will be engaged in the learning process when they want, which will lead to the use of self-management and self-control skills. Higher metacognition levels will also have positive effects on prospective teachers' e-mobile learning readiness perception. The structure of e-learning readiness was indicated by Hung et al. (2010) in six components that include computer, internet, and online communication self-efficacies, self-directed learning, learner control, and motivation for e-learning. Among these components, especially self-directed learning and learner control are directly related to self-management and control skills, which is a structure that supports the findings of the study. As such, self-management skills have a structure involving self-control and self-adjustment, which is also in line with the results of the study. On the other hand, self-directed learning in the m-learning context is an essential success factor in cases of flexible delivery, distance education, and resource-based learning such as m-learning (Prajapati & Patel, 2014). Metacognition and mobile learning have a direct and positive effect on e-mobile learning readiness perception. The results of the studies examined in the literature (Al-Adwan et al. 2019; Prajapati & Patel, 2014) support the proposed research model. Mobile Learning in the 21st century classrooms is a learning environment used by teachers to help children train their metacognitive skills. Blummer and Kenton (2014) examined the research strategies of children who want to reach information through mobile learning. As a result of the research, it was determined that if the metacognition skills of children were developed, they used different research strategies in different digital media to reach information.

Conclusion, recommendations, limitations, and future research

Prospective teachers' self-regulation, self-assessment and control skills positively affect their metacognition skills. The metacognition skill of prospective teachers has a positive effect on mobile learning readiness perception. Tsai and Chuang (2005) claimed that metacognitive activities have a significant role in e-learning, and they noticed the requirement of enhancing epistemological views of students by diversifying the use of metacognitive practices. In the literature, it has been determined that cognitive awareness has a positive effect on e-mobile learning readiness perception (Mac Callum & Jeffery, 2015). Damopolii and Kurniadi (2019) expressed that in biology teaching, mobile learning use will have a positive effect on the use of students' metacognition skills. In order to realize the impact of mobile learning use on learning, students need to be able to improve their metacognitive skills (Terras & Ramsay, 2012).

The fact that prospective teachers take responsibility for their own learning and making choices with self-control and self-management will improve their planning, organization and evaluation skills. This may positively affect their readiness for e-mobile learning. In such a process, prospective teachers are expected to use their self-control and self-management skills. From this point of view, training based on cognitive awareness strategies that improve teacher candidates' self-regulation, self-assessment and control skills can be provided. Pre-service teachers with metacognition skills will improve themselves and their learning processes, and this will let them develop a more positive attitude towards mobile learning. Moreover, prospective teachers' technological knowledge needs to be supported to increase their mobile learning readiness. To do this, there is a need for mobile learning environments to be prepared in line with the content of fields of pre-school, classroom, science and psychological counseling,

Interactive platforms that will enable mutual interaction through e-mobile learning supporting their self-control and self-management skills could be formed so that prospective teachers can solve the problems encountered throughout their teaching and be determined in reaching their goals,

For pre-school prospective teachers and Psychological counseling prospective teachers, who do not have a specific content in the curriculum and support children's development, a digital environment could be developed for information sharing with colleagues, becoming aware of current activities, and improving their metacognition through e-mobile learning,

For classroom and science teaching prospective teachers, who have a specific content in the curriculum and support children's development, a digital learning environment could be developed for enabling them to obtain current information,

reach goals by increasing their determination in the face of difficulties they encounter, and access current information with e-mobile learning environments. This study was conducted only with the participants consisting of teacher candidates at a state university in Turkey. However, the participants of the research can be expanded with different teaching areas of higher education. Quantitative research methods may create limitations in order to determine the latent aspects of the proposed model. For this reason, the details of the model can be revealed by using qualitative methods in future research. In addition, the model can be evaluated by considering the personal variables determined according to the literature for new research studies to be made regarding the proposed model.

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