



PRE-SERVICE ELEMENTARY MATHEMATICS TEACHERS' OPINIONS ON THE SCHOOL EXPERIENCE COURSE CONDUCTED THROUGH DISTANCE EDUCATION

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Abstract: This study aims to examine the experiences of pre-service elementary mathematics teachers regarding the school experience course conducted through distance education due to the Covid-19 pandemic. The study was conducted with 64 volunteer participants, from students who took the School Experience course in the fall semester of the 2021-2022 academic year at a state university, which was determined by convenience sampling among the universities in Turkey. The data was gathered using Google form at the end of the fall semester, using a data collection tool including 4 open-ended questions. These questions were about general evaluation, contributions, faced problems, and suggestions about the school experience course process. The study is phenomenological research from qualitative research types, and the content analysis method was used to analyze the data. Based on the analysis of the collected data, the following codes were obtained: positive, neutral, and negative under the heading of general evaluation; no contribution, getting to know students, professional skills, and time under the heading of contributions; technological problems, lack of professional skills, professional satisfaction, and communication under the heading of faced problems; and active participation, changing the course content, educational support, face-to-face education, student participation, and technological support under the heading of suggestions.

Key words: distance education, school experience, pre-service elementary mathematics teachers.

1. Introduction

Covid-19 virus, which first appeared in Wuhan, China, in late 2019, spread globally and on March 11, 2020 was officially declared a pandemic by the World Health Organization (World Health Organization [WHO], 2020). In 2020, the Covid-19 pandemic has impacted all countries and forced them to change their systems. The impact of the pandemic on Turkey's education system started to be seen on March 11, 2020, when the first case was reported in the country (T. C. Sağlık Bakanlığı, 2020). Several measures were taken to reduce the spread of the pandemic, including the temporary closure of some businesses, curfews, and implementing telecommuting options. One of these measures was the suspension of face-to-face classes in educational institutions. The spring mid-term break was extended from one week to two weeks and it was announced that distance learning would be implemented in primary and secondary schools from March 23, 2020 (T.C. Sağlık Bakanlığı, 13 March 2020). Since then, the primary and secondary school educational process continued with TRT EBA TV broadcasts, homework assignments, etc. By April 30, 2020, EBA live lessons were scheduled for all school types and class levels within a program. In the following period, different procedures were implemented according to the course of the pandemic for different grades. Similarly, universities were first suspended for 3 weeks from March 16, 2020, and then the start of distance learning was announced on March 23, 2020. (Yükseköğretim Kurulu [YÖK], 2020). With the decisions of the Ministry of National Education and Council of Higher Education, distance education necessarily became a vital part of education.

1. 1. Distance education

Distance education is an educational process in which the teacher and the students do not have to be in the same setting (İşman, 2022). Communication technology is used to bring together students,

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teachers, and educational materials (Simonson, Smaldino, Albright & Zvacek, 2012). The instructor and the learners do not have to be in the same place, allowing the learner to reach the instructions anytime, anywhere, take courses from different institutions, or receive training from different instructors which is impossible during face-to-face education, and progress at their own pace. Therefore, this model gives students individuality, flexibility, and autonomy (Uşun, 2006). However, not being in the same place creates problems besides its advantages. For example, student-teacher and student-student interactions may decrease and hinder students' social development (Akyürek, 2020).

Looking at the history of distance education, it is known that it started in 1728 through postal mail (İşman, 2022). In Turkey, distance education began in 1927; the process began with postal mail, followed by radio and television. With the development of Internet technology in the 1990s, distance education began to be conducted through web-based applications (Kırık, 2014).

1. 2. Emergency distance education activities

The pandemic caused many countries to switch from face-to-face to distance education (Can, 2020). Due to this sudden transition, distance education activities during this period are also referred to as emergency distance education activities in the literature (Akkoyunlu, Bardakçı & Dağhan, 2020; Hodges, Moore, Lockee, Trust & Bond, 2020; Ferri, Grifoni & Guzzo, 2020).

Emergency distance education activities enable education to continue as distance education in times of crisis. They are used temporarily until the crisis ends instead of providing planned, programmed education through an online platform (Hodges et al., 2020). During the Covid-19 pandemic, almost all educational activities had to be carried out only through distance education (Koç, 2021). This rapid change has required all levels of education to adapt their educational settings to distance education as soon as possible. As part of the emergency distance education activities carried out during the pandemic in Turkey, many universities adopted distance education in the 2020-2021 academic year (except for some applied courses).

During the period of Covid 19, the courses within the Faculties of Education in Turkey started to be executed via distance education. It was decided that the senior students' internship program courses, which are School Experience and Teaching Practice, would also be carried out through distance education.

1. 3. Faculty of education internship practices

Between 2005 and 2018, undergraduate students in elementary mathematics education programs at the Faculties of Education in Turkey participated in two internship courses: School Experience and Teaching Practice. The purpose of these internship courses is "to ensure that pre-service teachers are better prepared for the teaching profession and that they gain the ability to use the general culture, special content education and knowledge, skills, attitudes and habits related to the teaching profession in a real education-training environment." (MEB Mevzuat, 1998/2493, p. 1). In line with this purpose, pre-service teachers attended internship activities in schools affiliated with the Ministry of National Education for 4 hours a week within the scope of the School Experience course (YÖK, 2017). They engaged in various activities such as observing the teacher, observing the students, examining teaching methods, asking questions, getting information about school management, getting experience in classroom control, planning activities, and lectures. For the Teaching Practice course, they attended schools for 6 hours a week and participated in teaching activities accompanied by mentor teachers (YÖK, 2017). The shift of middle schools to distance education during the pandemic has also affected pre-service teachers' internship activities. Since face-to-face education did not continue in schools and the teaching was conducted online, pre-service teachers had to complete their School Experience and Teaching Practice courses through distance education activities. Consequently, they participated in online lessons organized by their mentor teachers, observed students and teachers, implemented the activities they prepared using online platforms, and gave online lectures.

1. 4. The aim and significance of the study

The changes experienced in all education levels due to the pandemic have affected educators, who have tried to adapt rapidly to online learning settings (Korkmaz & Toraman, 2020). It also increased educators' stress and workload (Marek & Chew, 2021). It brought many social, pedagogical, and

technological challenges (Ferri et al., 2020). At this point, the experiences of the stakeholders of the faculties, which are the institutions where future teachers are trained, are also crucial regarding this phenomenon that was being experienced for the first time. Concerning emergency distance education activities, in Turkey various studies have been conducted to determine the opinions of academicians (Çardak & Güler, 2020; Şeren, Tut & Kesten, 2020) and pre-service teachers (Bahadır, 2021; Saralar-Aras & Güneş, 2022; Ortaş & Demir, 2022; Tatlı, Er Nas & Şeyihoğlu, 2022; Turgut & Yıldırım, 2022; Öztürk, Kırıcı & Turan, 2021; Yolcu, 2020) who are the stakeholders of faculties of education. Pre-service teachers experienced various problems during this process because they had to meet the online school environment for the first time. They lived their first school experiences as a teacher in online settings with which they were unfamiliar rather than in a classroom setting. Various studies were conducted with pre-service classroom teachers (Bayındır, 2021; Yılmaz, 2021), theology students (Koç, 2020), pre-service German language teachers (Yiğit, 2022), physical education students (Aygüneş, Mirzeoğlu & Güneş, 2022), pre-service Turkish teachers (Kırıcı, 2022), and pre-service science teachers (Koray & Pekbay, 2022) on their internship experiences. As the implementation of mathematics courses, which have a unique language and terminology, may be different, this study is believed to contribute to the literature by obtaining the opinions of pre-service elementary mathematics teachers in the School Experience course, where the activities of observing teachers and students are at the forefront. Therefore, this study aimed to examine the experiences of senior elementary mathematics pre-service teachers in the fall semester of the 2019-2020 academic year regarding the school experience course, their first internship practice.

2. Method

2. 1. Research design

A qualitative research approach was used in this study. It is a phenomenological study (Creswell, 2013), which is based on the experiences of pre-service teachers related to the School Experience course process conducted with distance education. The participants of the study were 64 pre-service mathematics teachers in an Education Faculty in Turkey, who were determined by convenience sampling. However, one participant was excluded from the analysis due to non-valid responses, and the responses of 63 participants were analyzed. The data were collected at the end of the fall semester after the participants attended the school experience course.

Data were collected using an online form sent to participants at the end of the fall semester. The form included 4 open-ended questions about the school experience course conducted through distance education. The researchers prepared open-ended questions for the research problems and consulted a field expert.

The questions in the online form were as follows:

1. What is your overall evaluation of the school experience course conducted through distance education?
2. What do you think about the contributions of the school experience course conducted through distance education?
3. What kind of problems did you face in the school experience course conducted through distance education?
4. What are your recommendations for a more effective school experience course conducted through distance education?

After the fall semester ends, the online form was sent to all senior pre-service mathematics teachers in the Education Faculty, and 64 pre-service teachers voluntarily provided feedback within five days.

2. 2. Data analysis

Content analysis was used in the study to reveal embedded meaning in students' written answers. Pre-service teachers' responses were analyzed separately for each question. The responses to each question were read and coded, and then the codes were grouped into categories. For example, responses to the second question coded as learning classroom management, experience with lesson planning, and

learning to deal with distance education issues were combined under the category of professional skills.

Different categories were obtained for each question at the end of this process. For example, the pre-service teachers' responses to question 1 were analyzed using the codes NE (negative), NL (neutral), and PE (positive). The categories and sample answers for the first question are shown in Table 1.

Table 1. *The categories and sample answers for the first question*

Category	Sample answers for each category
negative	"During the distance education process, listening and teaching lectures were not efficient. I did not communicate with the students. I did not teach as efficiently as I dreamed. Because I did not use the methods and materials I wanted to use while teaching. [P52]*"
neutral	"It had both positive and negative aspects. One of the positive aspects is that we learned how to use programs that we can use for distance teaching, for example, zoom. The negative aspect was that we did not have the opportunity to observe the teacher's behaviors in the face-to-face educational settings. [P19]"
positive	"The process had no deficiency or disruption; everything was positive for me. [P13]"

Note. *[P52], represents pre-service teacher #52.

On the other hand, some responses were assigned to more than one category. For example, P15 responded to the third question, "Internet connection problems and communication problems with students." The first part of the response was coded as technology problems, and the second part was coded as a lack of interaction with students.

To ensure the reliability of data analysis, firstly researchers coded pre-service teachers' responses separately. Similar codes emerging in code patterns were combined, generating a code set. For example, two different codings such as "observing students" and "getting to know students" were combined as "getting to know students". The researchers conducted a second coding using this set. Inter-researcher coder reliability was calculated using the Miles & Huberman (1994) formulas and was found to be 90%. The researchers reached a consensus on the items where they coded differently. For example, for Question 3, "The stress and anxiety I felt during the lecture decreased. [P1]" was coded as "contribution in the affective domain" by one of the researchers, while it was coded as "experience" by the other. Researchers discussion concluded that since there was a change in the teacher candidate's emotions as a result of his experience, it was decided to code as "experience" and the "contribution in the affective field" category was canceled.

The findings are given in the next section.

3. Findings

This study examined pre-service teachers' experiences through distance learning in the School Experience course. Four questions were asked of pre-service teachers for this purpose. Their responses were analyzed separately for each question, and the results were presented.

3.1. Findings on pre-service teachers' overall evaluation of the School Experience course conducted through distance education

In the first question, pre-service teachers were asked to evaluate the overall distance learning process in the School Experience Course. Their responses were grouped into three categories: positive, neutral, and negative. The results are summarized in Table 2.

Table 2. *The findings on the overall evaluation*

Categories	Frequency	Percent (%)
negative	36	57.14
neutral	15	23.80
positive	12	19.05
total	63	100

Table 2 shows that more than half of the pre-service teachers' opinions were negative. They thought the process was ineffective because it was insufficient to acquire professional skills. For example, one of the responses was as follows:

"Not being in the classroom environment negatively affected the process. We only had the internship in our senior year, which was inefficient because it was online [P7]."

Nearly one-fifth of pre-service teachers thought that the process progressed quite well, and they practiced distance learning. One of them expressed her thoughts as follows:

"Our teacher and advisor were very supportive. We got the best possible result under the existing circumstances [P12]."

Both positive and negative aspects of the process were mentioned by some pre-service teachers., o their overall assessment was neutral. From the responses, it can be said that they were satisfied with being safe at home and learning how to manage distance teaching. However, they were unsatisfied because they were not involved in a face-to-face teaching process. For example, one of the responses was as follows:

"We could not teach enough lectures in distance education and could not communicate enough with the students. So, I think conducting the school experience course through distance education will create deficiencies in terms of experience for pre-service teachers. However, due to the pandemic, being at home and being able to do the practicum with this system was positive. [P31]"

All responses were reviewed, and it was found that the pre-service teachers were generally dissatisfied with the process. Although some pre-service teachers benefited positively from the process, their expectations remained unmet.

3. 2. Findings on contributions of the School Experience course conducted through distance education

In the second question, pre-service teachers were asked to indicate the contributions of the School Experience Course to them. The responses have been grouped under five categories: no contribution, getting to know students, professional satisfaction, professional skills, and time. The findings are summarized in Table 3.

Table 3. *The findings on contributions*

Categories		Frequency	Percent (%)
no contribution		9	0.01
getting to know students		10	13.70
professional satisfaction		5	6.85
professional skills	distance learning	27	36.99
	classroom management	5	6.85
	lesson planning	8	10.96
	experience	6	8.22
	learn to deal with problems	1	1.37
time		2	2.74
total		73	100

Most pre-service teachers asserted that the process contributed to them in terms of professional skills, such as learning how to conduct the course through distance education, classroom management, lesson planning, gaining experience, and coping with problems. In particular, 37% of pre-service teachers said they learned how to teach in distance education. One of them stated his opinion as follows:

"The significant contribution is that I learned which kind of strategies can be implemented and which techniques can be used if I face a similar situation and need to conduct my lessons through distance education. [P14]"

Some pre-service teachers stated that they realized that teaching is a very important job and that giving lessons made them feel exactly like a teacher. These responses were put under the professional satisfaction category. A sample response is as follows:

"The lectures I instructed in the school experience course conducted through distance education made me feel like a teacher. [P47]"

According to two pre-service teachers, distance education had an advantage, as they did not spend time to reach the school. In addition, some pre-service teachers asserted they had the opportunity to observe students and communicate with them. One of these responses, categorized as getting to know students, is as follows:

"I had the opportunity to communicate with students. I observed the questions they asked. Thus, I realized the subjects they did not understand and the contents they had difficulty with. [P45]"

3. 3. Findings on problems in the School Experience course conducted through distance education

In the third question, pre-service teachers were asked to express the problems they experienced in the School Experience Course. The categories formed in this context are technological problems, lack of professional skills, professional satisfaction, and communication. The results are summarized in Table 4.

Table 4. *The findings on problems*

Categories		Frequency	Percent (%)
technological problems		28	37.84
lack of professional skills	classroom management	9	12.16
	other	9	12.16
lack of professional satisfaction		3	4.05
lack of communication	with the teacher	7	9.46
	with students	8	10.81
no problem		10	13.51
total		74	100

The responses showed that most pre-service teachers' problems were related to technological issues. The most critical problem was Internet connection and the lack of technological equipment suitable for distance education. For example, technological problems were mentioned by a pre-service teacher as follows::

"Internet connection problems, microphone-related problems, difficulty typing with the mouse, unclarity of mathematical images, etc. [P23]"

Another problem was insufficient communication. Due to the lack of face-to-face interaction, pre-service teachers had communication problems both with students and mentor teachers. In addition, they also stated that the process was insufficient to gain professional skills and increase professional satisfaction.

It was noteworthy that pre-service teachers faced problems related to classroom management while gaining professional skills. A pre-service teacher stated the problems in acquiring professional skills as follows:

"Since we could not teach in a face-to-face education setting, we did not gain enough teaching experience and could not observe the teacher sufficiently. [P35]"

Overall, most pre-service teachers (%84.13) had experienced technical, professional, and communication problems in this process.

3. 4. Findings on recommendations for the School Experience course conducted through distance education

In the fourth question, pre-service teachers' suggestions for a more effective School Experience Course were asked. Six categories were formed, and they are as follows: active participation, face-to-face

education, student participation, technological support, educational support, and changing the course content. The findings are summarized in Table 5.

Table 5. *The findings on recommendations*

Categories	Frequency	Percent (%)
active participation	14	22.22
changing the course content	6	9.68
educational support	5	8.06
face-to-face education	12	19.35
student participation	5	8.06
technological support	5	8.06
no answer	16	25.81
total	63	100

Three out of four pre-service teachers offered suggestions for a more efficient school experience course conducted through distance education. Active participation of the pre-service teachers in lessons and conducting face-to-face education instead of distance education were mentioned the most. Those who suggested face-to-face education underlined that the most effective way of conducting the school experience course is face-to-face; therefore, the internship should be experienced in the school environment. Those who suggested active participation mentioned that they could be given a more active role while teaching mathematics lessons and that they should be given the chance to lecture for more hours, solve more problems, and do activities with students. One of the pre-service teachers expressed these suggestions as follows:

"It can be ensured that we are more active in the lessons and communicate more with the students. Additional lessons can be planned via Zoom for math activities [P28]."

In addition to their own active participation, some pre-service teachers suggested that students' participation in the lessons was also low, and it caused their motivation to decrease. Therefore, some measures should be taken to increase students' participation in middle school mathematics courses during the distance education process.

8.06% of pre-service teachers stated they needed educational and 8.06% technological support. Those who needed educational support stated that pre-service teachers could be trained on how to carry out distance education efficiently. A pre-service teacher requesting technological support said:

"If the School Experience course will be conducted through distance education, at least some technological equipment could be provided to us. We can go to the schools and use technological equipment such as computers, graphics and tablets provided there. [P39]"

Six pre-service teachers suggested that the content of the school experience course should be adapted to distance education. One of the responses given in this context is as follows:

"Integrating the activities we do within the scope of the school experience course into distance education may be more beneficial. [P12]"

4. Discussion and conclusion

This section discusses the results of this study, which elicited the thoughts of pre-service elementary mathematics teachers about the school experience course done through distance education, in light of the research findings.

First, pre-service teachers' opinions about the process show that most participants' overall evaluation was negative. From their statements, it can be concluded that negative evaluation is due to the various problems they experienced in the process and their inability to achieve the desired outcomes. This result complements another study. Pre-service teachers expressed the failure to achieve all course objectives as a general limitation of distance education, stating that they had problems, especially in applied courses (Bahadır, 2021). The opinion of academicians about the applied courses is on the same page, suggesting that a different approach suitable for applied courses should be created. (Şeren et al., 2020). Therefore, it can be concluded that distance education is not very appropriate, especially in applied courses, leading to pre-service teachers' dissatisfaction. In addition, their general perceptions

of distance education may also have had an impact. Some pre-service teachers evaluated this process considering the circumstances and stated it was carried out decently despite challenges. The common point of pre-service teachers' positive opinions is that they felt safe at home.

Regarding the contributions of doing an internship through distance education, the majority of the participants stated that this process improved their teaching skills, such as planning and implementing courses appropriate for distance education. In the study of Yılmaz (2021), pre-service primary school teachers also stated that experiencing the distance education process was a positive aspect of the internship through distance education. The teachers had to conduct their lessons through emergency distance education activities around the world; this created an awareness of the possibility of facing a similar situation in the future, and for this reason, they perceived it as an opportunity to improve themselves, especially in distance education during their school experience.

Many pre-service teachers reported that the experience did not contribute to their professional development. Sepulveda-Escobar and Morrison (2020) stated that although pre-service teachers had the opportunity to try online settings in distance education teaching practices, the difficulties of the process stood out more. Therefore, it can be concluded that pre-service teachers could not benefit enough from the process due to the difficulties they experienced. In the study conducted by Coşkun Şimşek, İnam, Yebrem Özdamar and Turanlı (2022) with mathematics teachers, the teachers stated that they did not have enough initial knowledge about how to conduct a lesson appropriate for distance education at the beginning of the pandemic and that they learned all as a result of their own efforts during this process. That is, during the School Experience course process, the mentor teachers did not have enough knowledge to provide adequate support to pre-service teachers. They were also learning and experiencing distance teaching for the first time, so they had difficulties in supporting pre-service teachers.

Regarding the problems pre-service teachers experienced during the internship, technological problems were at the forefront. In many studies, technological problems were identified as one of the most critical obstacles to online processes (Bayındır, 2021; Ferri et al., 2020; Hietanen & Svedholm-Häkkinen, 2023; Sidi, Shamir-Inbal & Eshet-Alkalai, 2023; Yaşar & Şimşek, 2022; Tong, Uyen & Lu, 2023; Yılmaz, 2021). In addition to the problem of Internet connection, the difficulty of using symbols and notations in online teaching, which results from the unique structure of mathematics, was the reason for this problem. Another problem was the lack of communication. When the school experience course is done face-to-face, pre-service teachers spend 4 hours at the school with the mentor teacher and students. They have the opportunity to talk to the mentor teacher during break times. In contrast, in distance education, they can only take the course online and for a limited amount of time, resulting in fewer opportunities for interaction. Similarly, in another study, most pre-service teachers said that being in different locations limited teacher-student interaction (Burleigh, Wilson & Lane, 2022). Students' failure to attend class regularly and turning off their webcams during instruction also reduce teacher-student interaction. In the study of Yılmaz (2021) on pre-service classroom teachers' teaching practice courses, participants stated that their students did not attend classes regularly and interact enough with them. In addition, pre-service teachers reported that their professional development was stunted because they did not experience teaching through face-to-face instruction. Some other studies complement the same result. Pre-service teachers who took teaching practice courses through distance education stated that there were deficiencies in the professional skills they acquired (Aygüneş et al., 2022; Bayındır, 2021; Güven & Uçar, 2021). It can be said that problems such as lack of opportunities to observe and lecture in face-to-face settings and difficulties in communicating with teachers and students caused them to feel inadequate in their professional development.

The analysis of the pre-service teachers' suggestions for improving the process shows that it is necessary to conduct this course face-to-face. Most of them evaluated the whole process negatively; therefore, it can be said that they expect to get a much better education through a face-to-face internship program. They pointed to the lack of technological support for solving technological problems as one of the shortcomings. They believe the courses would have been much more productive if they had been well-equipped with technology. Studies have shown that most university students in Turkey attend their courses through mobile phones (Karatepe, Küçükçengçay & Peker, 2020; Şener, Şener Taplak & Hübek Akarsu, 2022). Accordingly, it can be said that pre-service

teachers are likely to attend these classes under similar circumstances. It is pretty difficult to fulfill the requirements of the School Experience course, such as lecturing and observing students and teachers on cell phones. Similarly, they mentioned the need for technological equipment specific to teaching mathematics. They stated that in distance education, teachers should have technological tools so that they can use mathematical language (Coşkun Şimşek et al., 2022).

The pre-service teachers added that the process could be made more efficient with the students' more active participation in the lessons. Regarding the studies conducted in Turkey during the pandemic, the participation of secondary school students in the lessons was low (Bakırcı, Özcan & Kara, 2021; Canpolat & Yıldırım, 2021; Tican & Toksot Gökoğlu, 2021; Uyar, 2020). Due to this low participation, the pre-service teachers' motivation decreased, and they could not be active enough in the lessons conducted with few students. Other suggestions were to revise the content of the teaching practice courses, initially designed for face-to-face education, and to provide training on conducting courses through distance education. It can be assumed that they suggested this because the content of the introductory courses within the emergency distance education activities was not planned according to the new procedure, and they had similar experiences before. They also need pedagogical support. Similarly, Smith and Schlaack (2021) also reported that pre-service teachers need more support in this process. In this direction, it can be suggested that the undergraduate courses "Open and Distance Learning" and "Information Technologies", which introduce the technologies used in distance education, should be offered effectively and efficiently in undergraduate education. They should cover the platforms that can be used in distance education and the tools that can be used in mathematics education, such as graphic tablets.

As a result, pre-service teachers generally had difficulty achieving the gains they expected from the School Experience course delivered through distance education. They felt that they had developed professionally only in distance education methods and failed in other areas of professional development. In addition, technological problems, low student participation, and interaction problems harmed pre-service teachers. Based on these results and the pre-service teachers' suggestions, the teaching practice courses should be continued in a hybrid way in the face-to-face units of educational institutions, even if urgent distance education activities are started. At the same time, the practicum course could be given to students other than seniors in different semesters as a measure against similar situations.

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