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What Preservice and In-Service Teachers Say about E-Mentoring?

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ABSTRACT

E-mentoring can provide a mentoring process using the advantages of technology and eliminating barriers of distance and time. Preservice teachers need mentoring during their education to help develop their theoretical and practical knowledge. A growing body of study suggests that a well-structured mentoring process is essential for preservice teachers on professional development. To that end, the purpose of the study is to reveal the preservice teachers' and in-service teachers views on the e-mentoring program. The study adopted an exploratory case design as a qualitative method by exploring the participants' views on the process and involved holding lectures and mentor–mentee meetings over 10-week course and following the three-stage process to carry out the e-mentoring implementation process with 16 inservice teachers (mentors) and 49 preservice teachers (mentees). Participants found the process very beneficial, especially regarding interaction with the teacher, transferring experience, and determining a career plan. Mentors shared their experience through the mentoring process, increased mentees' interest in the profession, and obtained information about practical activities for the students. This study has significantly contributed to a process that can increase mentees' theoretical and practical skills, improve their professional knowledge about their future teaching, and develop positive attitudes toward the profession. In addition, mentors help mentees to be more prepared for the setbacks they may encounter in the future. According to the literature, no study addresses the implementation of e-mentoring with both mentors and mentees in information technology area. According to the findings, mentors transferred their experiences, helped mentees to be more prepared for the future, increased their interest in the profession, and obtained information about practical activities for their students. Consequently, education stakeholders and planners should consider further integrating mentoring into teacher education.

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Hizmet öncesi ve hizmet içi öğretmenler e-mentorluk hakkında ne diyor?

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ÖZ

E-mentorluk, teknolojinin avantajlarını kullanarak mesafe ve zaman engellerini ortadan kaldıran bir mentorluk süreci sağlayabilir. Öğretmen adayları, teorik ve pratik bilgilerini geliştirmeye yardımcı olmak için eğitimleri sırasında mentorluğa ihtiyaç duyarlar. Gün geçtikçe artan sayıda çalışma, profesyonel gelişim konusunda öğretmen adayları için iyi yapılandırılmış bir rehberlik sürecinin gerekli olduğunu göstermektedir. Bu çalışmanın amacı, öğretmen adaylarının ve öğretmenlerin e-mentorluk programına ilişkin görüşlerini ortaya çıkarmaktır. Çalışma, katılımcıların sürece ilişkin görüşlerini keşfetmesiyle nitel bir yöntem olarak keşfedici durum desenini benimsemekte ve 10 haftalık bir ders kapsamında ders süreçlerini yürütmeyi, mentor-menti görüşmeleri gerçekleştirmeyi ve üç aşamalı süreci takip ederek 16 mentor ve 49 öğretmen adayı ile e-mentorluk uygulama sürecini yürütmeyi içermektedir. Katılımcılar süreci özellikle öğretmenle etkileşim, deneyim aktarımı ve kariyer planı belirleme açısından çok faydalı bulmuşlardır. Mentorlar, mentorluk süreciyle ilgili deneyimlerini aktarmış, mentilerin mesleğe olan ilgisini artırmış ve mentiler öğrencilere yönelik gerçekleştirilen uygulamalı etkinlikler hakkında bilgi edinmiştir. Bu çalışma, öğretmen adaylarının teorik ve pratik becerilerini artırabilecek, gelecekteki öğretmenlikleriyle ilgili mesleki bilgilerini geliştirebilecek ve mesleğe yönelik olumlu tutumlar geliştirebilecek bir sürece önemli katkı sağlamıştır. Ayrıca mentorlar, öğretmen adaylarının gelecekte karşılaşabilecekleri aksiliklere karşı daha hazırlıklı olmalarına yardımcı olabilecektir. Literatüre göre bilişim teknolojileri alanında hem uzman öğretmenler hem de öğretmen adayları ile e-mentorluk uygulamasını ele alan bir çalışma bulunmamaktadır. Bulgulara göre mentorlar böyle bir ortamda deneyimlerini aktarabilmiş, öğretmen adaylarının geleceğe daha hazırlıklı olmalarına yardımcı olabilmiş, mesleğe olan ilgilerini artırabilirmiş ve gelecekteki öğrencileri için hazırlayabilecekleri uygulamalı etkinlikler hakkında bilgi edinebilmişlerdir. Sonuç olarak eğitim paydaşları ve planlamacıları, mentorluğu öğretmen eğitimine daha fazla entegre etmeyi düşünmelidir.

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INTRODUCTION

Today, numerous studies focused on improving the quality of teacher education (James, Hudson, & Lasczik, 2021). Researchers have recently become interested in mentoring practices because they can significantly contribute to the professional development of preservice teachers by leveraging their current experience (Becher & Orland-Barak, 2018). While such practices have been around for a long time, they have only recently gained popularity (Karadağ, 2015). Mentoring is the practice of experienced teachers providing guidance and support to novice or preservice teachers and contributing to their professional development by sharing experiences (Portner, 2008). A mentor is a person who shares his or her knowledge and expertise with a mentee during the mentoring process. Mentoring practices can be undertaken for both teachers and preservice teachers. Mentoring areas in teacher education include adapting to the environment, classroom management, coping with stress, supporting personal development and lifelong learning, solving problems, building trust, implementing collaborative approaches, developing attitudes/behaviors, improving self-confidence, reducing loneliness, improving self-assessment, and so on (Allen, Eby, & Lentz, 2006). Additionally, mentoring practices aid in the easy transition of teachers who are new to the teaching profession to this process, and as a result, the improvement of all teachers' professional and personal development (Bakioğlu & Hacıfazlıoğlu, 2000; Tinker Sachs, Fisher, & Cannon, 2011). One research conducted with faculty members found that e-mentoring benefits communication, usability, quality educational design, and the formation of an archive for mentors and mentees (Yeşilfidan, 2019).

E-mentoring

Mentoring conducted over the Internet is called e-mentoring (Brescia, 2002). The literature also refers to e-mentoring as electronic mentoring, virtual mentoring, and online mentoring. As an essential component of lifelong learning, scholars have been focusing on e-mentoring (Hansman, 2002). E-mentoring practices involve using several tools, including video conferencing, blogging, online discussion platforms, and chat, which help make the e-mentoring procedure effective. Nowadays, the transition to distance education brought about by the Covid-19 pandemic has led to a decline in success rates of students who have experienced a fall in extrinsic motivation and a variety of other stimuli. In the literature, there are various studies on e-mentoring (Alemdağ 2015; Alemdağ & Erdem, 2017; Beck et al. 2022; Neal et al., 2022). The research highlights both the general needs of learners and the importance of e-mentoring. Our starting point is that although e-mentoring is used in some areas, education faculties should also be aware of the importance of these applications. The studies also emphasized that the preservice teachers gain improvement with e-mentoring. It is essential to optimize this application for preservice teachers by taking advantage of digital opportunities. The research in general and with pre-service teachers is presented below.

E-Mentoring in education and teacher profession

A review of the literature reveals a variety of research studies on the subject. Beck et al. (2022) studied with nine female faculty members who were part of a virtual mentoring network and designed a collaborative professional development project to explore mentoring relationships and practices. The women used a learning management system (LMS) to design six modules with complementary learning activities. They found that the virtual mentoring curriculum for the network of women faculty with diverse cultural backgrounds met expectations. Neal et al. (2022) examined how mentoring emerges in public service and how mentoring can evolve to address key goals of diversity, equality, and participation. They presented best practices and outcomes for the successful implementation of e-mentoring and developed an updated critical outcome model. Alemdağ (2015) set out to

establish participant satisfaction and contributions to building an e-mentoring program that would give online support for information technology teachers and examine the interactions throughout the implementation. The study included 14 mentee teachers who were new to the profession and 14 mentor teachers and faculty members with at least five years of experience. She determined that mentors and mentees liked the e-mentoring program. In the context of professional growth, she also noted that the e-mentoring program brought diverse cognitive and affective contributions to both mentee and mentor teachers. Alemdağ and Erdem (2017) designed an e-mentoring program for novice teachers to understand their satisfaction and the perceived benefits of the program. They found that the participants provided cognitive, affective, and instrumental support, and e-mentoring can be beneficial for novice teachers. In general, the studies found e-mentoring to be very helpful for both student and educator development.

Mentoring for Preservice Teachers

Various studies highlight the benefits of e-mentoring programs for preservice teachers. According to Tolbert's (2008) study, e-mentoring increased preservice teachers' confidence in math and science teaching. Kahraman (2012) conducted a case study involving undergraduate students, graduates, and faculty members from the computer education and instructional technology (CEIT) department. The study concluded that the e-mentoring practice positively impacted the participants' professional development. Also, the participants got first-hand knowledge and experience of their future plans by having the opportunity to focus on their careers holistically. Similarly, Ongoz (2019) implemented an e-mentoring program in the CEIT department. As part of the program, mentors (graduate students) learned how to manage a project team and achieve their professional goals by helping mentees. The mentees could interact with the programmable e-mentee and assist in developing technical equipment. Briscoe (2019) investigated the impact of the mentoring process on preservice teachers' professional development and learning of ambiguous parts of their future profession by drawing on the teachers' experiences in a virtual mentoring program. According to the study data, virtual mentoring allowed preservice teachers to be better prepared for the profession and eliminated the spatial limitations of face-to-face mentoring. Reese (2016) used the Skype application to conduct a virtual mentorship practice for preservice music teachers, examining the benefits and drawbacks of the procedure. During the process, teachers shared instructional videos regarding respective disciplines. She underlined that the procedure was helpful in preservice teachers' professional growth and leveraged the advantages of technology. Sepet (2020) found that, according to information technology preservice teachers' views, an e-mentoring application may contribute to their professional development by assisting them in drafting lesson plans, preparing resources for classes, and gathering information about teachers' experiences. Mutlu Gülbak and Akcan (2021) examined the expectations of language education preservice teachers from an e-mentoring program. They revealed that practicum procedures, understanding the e-mentoring process, practical observation, and effective feedback are among the highlighted issues. Ersin and Atay (2021) conducted a qualitative study with language education preservice teachers before and after an e-mentoring program to reveal their experiences in the pandemic mentoring programs. After the implementation, the participants had positive experiences from the e-mentoring process and received sufficient contextual and technological support. Applied research has revealed that mentoring practices positively impact preservice teachers' professional abilities. Given the contribution of mentoring practices to teachers and their workplaces, it is vital to investigate how mentoring practices, which have a relatively new history in teacher education and novice teachers' adaptation to the profession, grow nationally and internationally (Arslan et al., 2016). Moreover, guideline methods for teaching mentor teachers should be identified (Yazıcı & Tekerci, 2017). It is possible to identify such methods to be followed by soliciting the opinions of those participating in the mentoring process.

Current study

Preservice teachers gain extensive theoretical knowledge during their undergraduate education, but do not have the same opportunity to apply it. It is very important that they receive mentoring support in practice so that they can complete their professional skills (Graves, 2010). Accordingly, they need to benefit from experts' views to develop their professional skills (Briscoe, 2019). On the other hand, mentors may not live in the same area as preservice teachers or don't have time for these applications. This is one of the problems frequently experienced in traditional mentoring programs (Crisp, 2016; Fives, Hamman, & Olivarez, 2007), and preservice teachers who try to communicate with students and get mentorship may have serious difficulties in the process (Ersin, Atay, & Mede, 2020; Fives, Hamman, & Olivarez, 2007). Preservice teachers need immediate feedback on their questions and problems in this process (Conderman, et al., 2013). In such circumstances, e-mentoring eliminates time or place limitations and assists preservice teachers in improving their skills by providing higher-quality support (Spanorriga, Tsiotakis, & Jimoyiannis, 2018). In addition, no study addresses the implementation of e-mentoring with both expert teachers and preservice teachers in information technology area. The e-mentoring environment implemented in this study will support overcoming the physical and psychological distance between mentors and mentees (Neely, Cotton, & Neely, 2017).

The current study designed an e-mentoring program that includes in-service teachers' support for preservice teachers in information technology education and revealed the participant views to determine a qualified e-mentoring. Thus, it provides information about what an e-mentoring climate should look like, the influence of such a program on preservice teachers' professional growth, mentors' views of the program, and the e-mentoring practice's long-term viability. Since technology is used in the e-mentoring program and the participants are not familiar with it, the transition processes to such environments are considered important (Ersin, Atay, & Mede, 2020). Since there are few studies on this topic emerges the need for further studies on such processes (Tanis & Barker, 2017). Also, this study develops the preservice teachers' professional views with "Learning and Teaching Approaches in Informatics Course" as one of the main courses. This study, therefore, will also contribute to the research on developing preservice teachers' information technology education skills with an e-mentoring program. The purpose of this research is to find a solution to the question, "What are the views of preservice teachers and in-service teachers on the e-mentoring program?" The sub-problems of the study are as follows;

1-What are the views of mentee students on the e-mentoring program carried out in the study?

2-What are the views of mentor teachers on the e-mentoring program carried out in the study?

METHOD

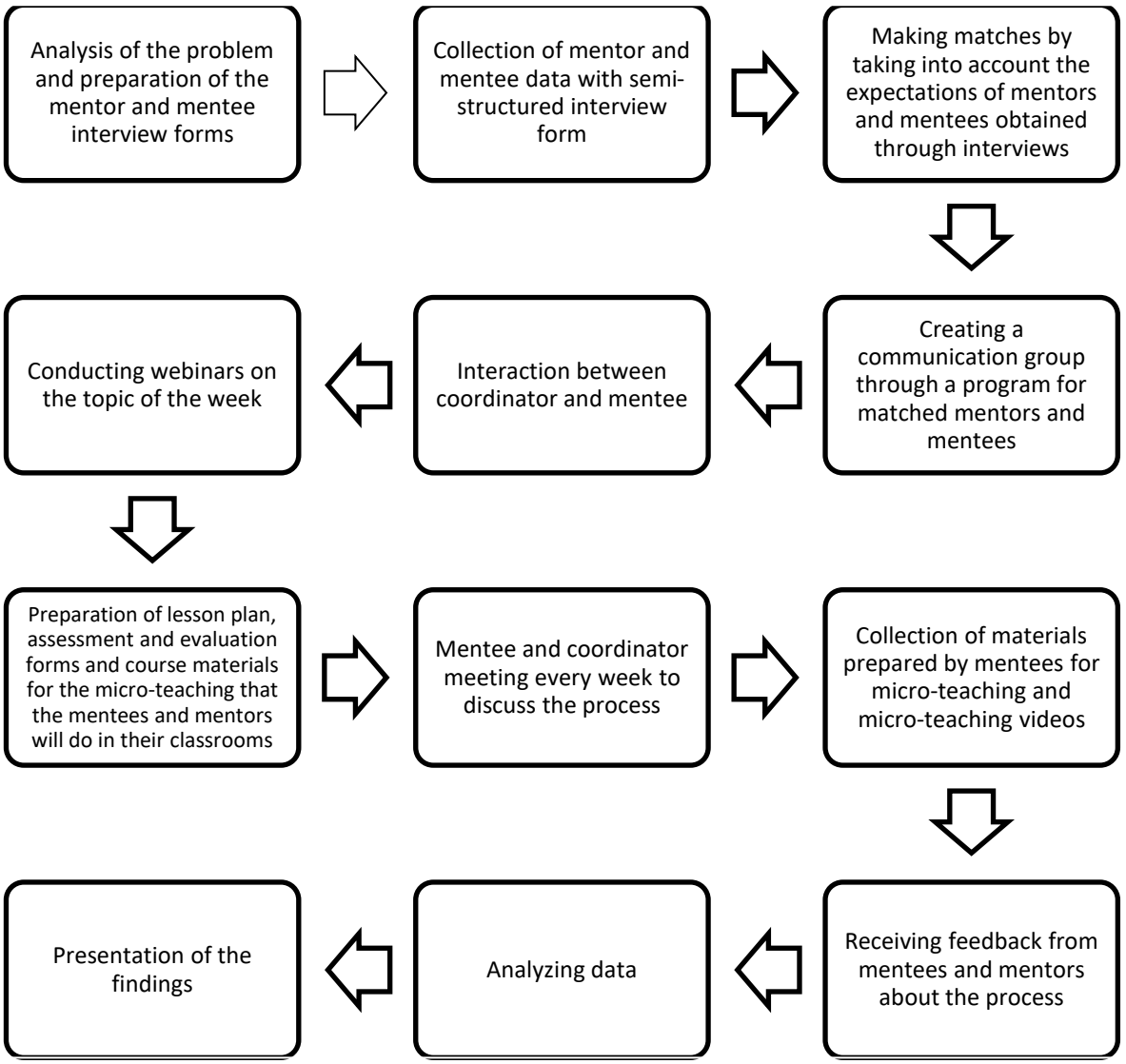
Research Model

The purpose of this study is to explore the views of preservice teachers and in-service teachers regarding the e-mentoring program. There are various mentoring approaches in the literature, such as teacher-centered, student-centered, data transmission or methodological processes (Aguilar, 2011; Deussen et al., 2007). In this study, the e-mentoring approach, which has emerged recently, and where mentoring processes are carried out in online environments, has been adopted. In addition, a rich process has been created, which includes a learner-centered mentoring approach that responds quickly to learner needs, in which learner-teacher communication is kept at the highest level (Deussen et al., 2007). To that end, qualitative method was employed in the study to reveal views of participants. Preservice teachers studying in the second year of computer education and instructional technologies (CEIT) took part in an e-mentoring implementation carried out within a Learning and Teaching Approaches in Informatics course. The groups of mentees, with

equal number of students in each group, were taken into consideration according to the students' good understanding and their interests (future work in private school / work in public school). In addition, considering this interest of the groups, they were matched with appropriate mentors. Explanatory case study design was adopted in order to reveal the general views of the participants regarding the application made in the study (Yıldırım & Şimşek, 2006; Yin, 2003). Explanatory case study includes clarifying situations or views about a particular event or program by creating themes from codes and developing new suggestions for the issue (Eisenhardt, 1989). The stages of study are described in detail in Figure 1.

Figure 1.

Stages of the study



E-mentoring Implementation Process

The research involved holding lectures and mentor–mentee meetings over 10 weeks and following the 3-stage process specified by Single and Single (2005) to carry out the e-mentoring implementation process. This 10-week content has been designed according to the content of the Learning and Teaching Approaches in Informatics course. Weekly topics and activities are shown in Table 1. Below are the stages of this process.

Planning

- Determining the goals in the e-mentoring implementation process
- Determining volunteer mentors by providing briefs
- Informing mentors about the process
- Orienting mentees to the process
- Making matches by taking into account the expectations of mentors and mentees obtained through interviews
- Program structure (Implementation)
- Creating a communication group through a program for matched mentors and mentees
- Interaction between coordinator and mentee (electronic)
- Conducting webinars on the topic of the week for mentor and mentee groups according to the predetermined time.
- Preparation of lesson plans, assessment and evaluation forms, and course materials for the micro-teaching mentees and mentors will do in their classrooms
- Collection of materials prepared by mentees for micro-teaching and micro-teaching videos

Assessment

- Ending the e-mentoring implementation process
- Mentee and coordinator meeting every week to discuss the process
- Collection of materials prepared by mentees for micro-teaching and micro-teaching videos
- Data collection from mentors and mentees at the end of the process
- Analyzing data
- Presentation of the findings

Table 1.

Weekly topics and activities

Week	Topic	Activities (In Class)	Activities (Out-of-Class)
WEEK 1	Purpose and Basic Principles of IT Instruction, Competencies, IT Instruction Legislation	Conducting Mentee Orientation and Discussion via the Padlet app (For example: What do you think are the objectives of the IT course?)	Ensuring Mentor and Mentee Interaction
WEEK 2	Teacher Competencies in IT	Quiz on Kahoot	Conducting Mentor and Mentee webinars on the topic of the week
WEEK 3	Teachers' Duties and Responsibilities		Conducting Mentor and Mentee webinars on the topic of the week
WEEK 4	IT Course Curriculum	Mentee Presentations	Conducting Mentor and Mentee webinars on the topic of the week
WEEK 5	Information Technologies Teaching Environments	Quiz on Learningapps	Conducting Mentor and Mentee webinars on the topic of the week
WEEK 6	The Most Used Instructional Method and Techniques in IT Lessons		Conducting Mentor and Mentee webinars on the topic of the week

WEEK 7	Useful Sites, Trainings, Projects for Information Technologies Teachers	Mentee Presentations	Conducting Mentor and Mentee webinars on the topic of the week and Informing Mentors about Micro-teaching
WEEK 8	Gagne's Nine Events of Instruction Lesson Plan and Material Development	Informing Mentees about Micro-teaching	Conducting Mentor and Mentee webinars on the topic of the week and determining the learning objectives for micro-teaching
WEEK 9	Micro-teaching and Applications	Giving feedback from mentees and mentors about the process	Conducting Mentor and Mentee webinars on the topic of the week and Focus Group Interviews with Mentees
WEEK 10	Micro Teaching and Applications	Giving feedback from mentees and mentors about the process	Conducting Mentor and Mentee webinars on the topic of the week and One-to-one interviews with mentors

Participants

16 teachers participated in the research in the role of mentor and 48 preservice teachers participated in the role of mentee. Two of the researchers took on the role of coordinator. The average age of mentees was 20. 28 of the mentees are male and 21 were female. The mentors were from various regions of Turkey and worked in different types of school. Nine of the mentors were female and seven were male. The mentors had at least 2 years' experience (see Table 2).

Table 2.

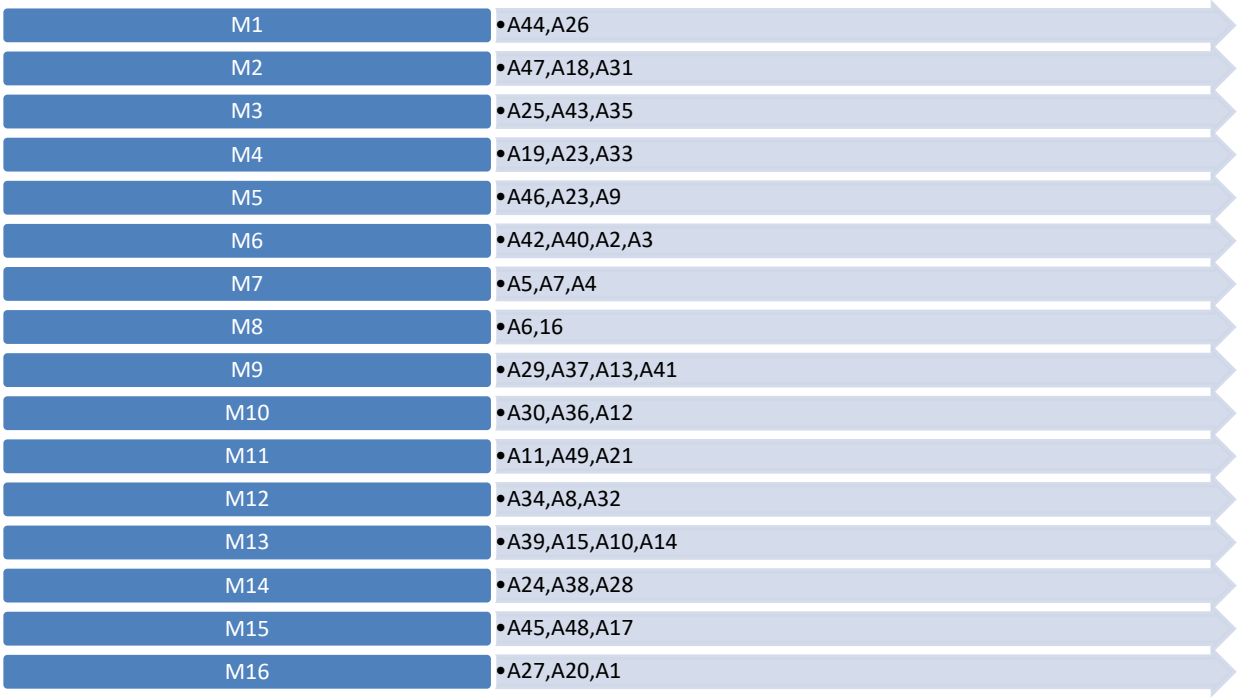
Demographic information of mentors

Participants	Gender	Year of Experience	School Type
M1	Female	2-3	Public school
M2	Female	5-6	Private school
M3	Female	2-3	Public school

M4	Female	2-3	Public school
M5	Male	6-7	Public school
M6	Male	4-5	Public school
M7	Male	6-7	Public school
M8	Female	3-4	Public school
M9	Female	5-6	Private school
M10	Female	6-7	Private school
M11	Female	5-6	Private school
M12	Male	3-4	Private School
M13	Male	7-8	Public school
M14	Male	3-4	Public school
M15	Male	6-7	Public school
M16	Female	2-3	Public school

Figure 2.

The matched mentors and mentees



Data Collection Tools and Analysis

The data collection tool was semi-structured interview forms consisting of a "mentor semi-structured one-to-one interview form" and "mentee focus group semi-structured focus group interview form". Two educational technology experts gave their opinions on the clarity, understandability, and scope of the semi-structured interview forms. After the experts' review, a pilot study was carried out with five teachers and five preservice teachers. Following necessary revisions and finalizing of the forms, mentors and mentees answered 12 questions each. The questions aimed to reveal the views of the participants about the e-mentoring implementation. Example questions are as follows:

1- What are your thoughts on the contribution of the e-mentoring implementation process to students?

2- Did the e-mentoring implementation process affect your professional development? How?

3- What are your suggestions for improving the e-mentoring implementation process?

Mentors and mentees were informed about the voluntary basis of the study and its purpose at the beginning of the process. Interviews with the participants lasted approximately one hour. The participants gave permission to take audio recordings.

The researchers conducted focus group interviews with mentee groups (four or five mentees in each group) involving a total of 18 participants online, and held one-to-one interviews with 16 mentors, which they recorded and transcribed. The researchers then applied content analysis to the data obtained. Content analysis is the process of analysing data collected by a researcher by determining a theme in order to address a certain purpose (Yıldırım & Şimşek, 2016). With this analysis, the data were examined in depth and by comparing the views of teachers and students, and the results were summarized together numerically for the reader to make comparisons (Balcı, 2013; Cohen, Manion & Morrison, 2007). Researchers read the transcriptions several times and interpreted them determining the themes and codes.

Validity and Reliability of Data

Member checking was done by allowing the participants to read the transcribed interview data after the interviews and by taking their comments on their data to ensure validity and reliability (Yıldırım & Şimşek, 2016). In addition, two educational technology experts provided their opinions. In addition, the researchers asked two different interpreters to examine the interviews, with whom they carried out the analysis in order to reaching agreed decisions. In addition, the researchers took recordings during the focus group interview and one-to-one interviews, which they then transcribed and analyzed in order to increase reliability. The data collection procedures were recruited by following the university's ethical standards.

FINDINGS

The findings of study illustrated the mentors' and mentees' views in depth. The findings were presented under the following headings (see Table 3 and Table 4).

Findings on Mentee Focus Group Discussions

Course Outcomes

In the theme of mentoring in theoretical courses, some mentees argued that there is no need for mentoring (n=10). As A34 said: "No. When I think about my lessons, I think that some of them are not needed." Similarly, A44 said: "We did it practically in some lessons and attended the last micro-teaching lesson. It

was very beneficial for us. At least we were able to make an introduction in terms of teaching. But it is not necessary for some of our lessons. We also get it theoretically." Some participants (n=8) stated that mentoring in theoretical courses is necessary. A37: "I think it is essential in theoretical courses because we want to gain experience. The mentor shares his experiences with us so we understand that subject." Similarly, A30 said: "It is necessary, I mean, we have seen the theoretical courses in practice. Learning becomes more permanent as we try. That's why we learn better. We gain experience by holding meetings with our teachers who are in that sector." According to these statements, the preservice teachers stated a need for e-mentoring in theoretical courses, but they mostly want mentoring in applied courses.

Tools Used in e-Mentoring

Some participants (n=4) stated that they used Zoom in the mentoring process. A23: "We only used Zoom, and that was for the meeting." Some participants (n=4) stated that they used both Zoom and WhatsApp. A30: "We talked over Zoom. We were in touch every day via WhatsApp." Some other participants (n=2) stated that they used Google Drive, Google Meet, and Scratch. A18: "We used Google Meet while holding the meetings. Our teacher shared using Google Drive. We also used Scratch to attend our teacher's lecture. We prepared materials …" In the theme of the mentoring process through a single tool, the participants generally gave a negative response (n=15). A23: "I think this is enough. It depends on what the teacher wants to use. He can either use Zoom or use Meet. I don't think anything else is needed." Some other participants (n=3) wanted a single tool. A30: "I think it may be necessary. For example, the mentoring platform could be a website. From there, we can both attend the live classes and upload our reflective diaries on that site. They wouldn't have been all separate. So, I think it could be a single platform." Participants generally answered (n=7) online chat and file sharing to the theme of features of a platform that can be used in mentoring. A30: "I want it to be like Zoom. It can be a place to upload assignments or a blog where everyone can express their opinion, for example, a place to write a post." Some participants (n=3) said they should have an instant notification, online chat, and file sharing features. A26: "There may be tasks and suggestions where there is a conversation, instant communication." Some participants (n=3) stated that it should be an easy and understandable platform. A44 expressed it as: "Easy to use. The platform needs to be easy to use." Accordingly, the mentees positively evaluated the mentoring process, leaving the choice of the tool to be used to the participants. A small number of mentees stated that e-mentoring might be carried out through a specific website. If a special platform is developed, the mentees suggested that this platform could have a structure that includes online chatting, adding tasks and suggestions and file sharing.

Problems Encountered

In the problems encountered theme, the participants generally (n=14) stated that they did not experience any negativeness. A18:"We held our meetings regularly every week. We ensured our participation. We did not experience any negativity ..." Some (n=4), however, did state that they had experienced negative experiences. A23 mentioned the indifference of the mentor as "It happened to us. Our teacher forgot us. We had to remind him again and again. He came a little late. Our teacher did not attend some of our meetings. He had to review the materials and give feedback. But he did not respond…". Besides, all participants (N=18) stated that they experienced positive experiences during the mentoring process. A11 expressed it as: "From start to finish, it was all positive as I learned something new every week, also in the final, micro-teaching was a good experience for me." Similarly, A30 said: "For example, we learned what we should do when there is no computer lab in a school we are assigned to, that is, what kind of activities could be done. I can say these things were positive for me." Similarly, A42 said: "It was very beneficial for me to do such a thing before starting my career. I would like to have the mentoring in the first grades rather than the last year. I think it was a good program. In other words, it was as if we had done a small internship practice…" According to the statements given by the mentees, the e-mentoring process was generally positive.

However, although rare, mentors sometimes forgot their responsibilities or did not act sufficiently concerned about the mentoring process.

Future Career Experiences

In the theme of the effects of the mentoring process on professional development, the participants generally (n=14) expressed it as "Making a professional contribution". A18: "The mentor explained to us what he had done in his professional life and what is needed and what is not." Similarly, A45 expressed it as: "What can we do during the university period? There may even be things that mentors wanted to do but could not do and they advised us. They say we couldn't do it, but you can do it like this. We can get important tips." Some participants (n=3) stated that it helped determine their career plan. A44 expressed it as: "When I started my second year, I wanted to leave this department and move on to engineering. But now I can say 'yes, I should definitely be a teacher.'" Another participant (n=1) expressed the mentoring process to his professional contribution to cope with difficulties. A21: "I saw what kind of difficulties I could encounter since they at least overcame the difficulties that may arise in the teaching process." According to the data obtained, this process gave mentees essential insights into their future profession. Mentees grasped what is critical or less necessary in their professional life and how they can cope when faced with a challenge. They also clarified their plans for their careers.

General Mentoring Process

In the theme of suggestions for developing the mentoring process, a few participants (n=3) answered: "The mentoring process should be face-to-face". A21: "It would be better if it were face-to-face rather than online teaching." Some participants (n=2) answered: "Should increase the interview time". A18: "Maybe the duration of the talks could have been longer. For example, 20-25 minutes could have been at least 40 minutes. However, once a week." Some other participants (n=2) highlighted "Observation". A20: "I think it would be nice for us to follow the mentors apart from the practice. If we could attend his lectures while he was at work, it would at least be effective as an audience." Accordingly, while some of the mentees stated that mentoring should be done face-to-face, some argued that e-mentoring would be more effective with an increase in the number of meetings and observations they had with the mentors.

In the theme of the characteristics of mentors, participants generally (n=7) stated that mentors should have experience. A30 expressed it as: "I think the mentors should be someone experienced in their field. For example, it might be someone with more experience, not a two-year teacher. Someone who has had more experience." Some participants (n=4) stated that the mentor should be willing. A29: "I think the mentor teacher must want to have these meetings and conversations with us because when talking to the teacher, the teacher must make us feel that they want to give us information, that is, they want to convey what they have learned to us." Some participants (n=4) stated that the mentor should be sincere. A24 expressed it as: "They should be friendly. They should transfer their knowledge to others voluntarily rather than as a duty …". Some participants (n=2) stated that mentors should support the mentee. A26: "In terms of counselling, mentors should be supportive." Another participant (n=1) said that mentors should be selfless. A18: "At first, they must be volunteers, so it requires sacrifice. So, mentoring should be on a voluntary basis." According to the data obtained, mentees generally expect experienced, willing, sincere, selfless, and supportive mentors.

All participants (N=18) wanted to participate in the theme of participation. A45 expressed it as: "I would like to because while continuing our education life, most of us want to be teachers or academicians. Our mentors maybe wanted to be academics in the past, but they have made various mistakes. At least they can save us from making mistakes by giving necessary suggestions. We are continuing our education life, and there may still be difficulties. We are only halfway through. At the very least, if these problems arise, we

can talk to them." Similarly, A20 said: "I would participate in the future because I think the lecture and the practice are completely different. That's why I would like its continuity to gain more experience." Participants generally stated that mentoring increased their experience in their education life. In this respect, if a mentoring application is made in the future, they want to participate in it.

Table3.

Findings on Mentee Focus Group Discussions

Category	Theme	Code	f
Course Outcomes	Need for mentoring in theoretical courses	Need	8
		No Need	10
Tools Used in e-Mentoring	Desired technological tools in mentoring	Zoom	4
		Zoom and Whatshapp	4
		Google Drive, Google Meet and Scratch	2
	Mentoring by a single tool	Insufficient	15
		Sufficient	3
	Features of a platform that can be used in mentoring	Online chat and file sharing	7
		Instant notification, online chat and file sharing	3
		An easy and understandable platform	3
Problems Encountered	Negative experiences	Not experienced negativity	14
		Experienced negativity	4
	Positive experiences	The Whole E-Mentoring Process is Positive	18
Future Career Experiences	The effects of the mentoring on professional development (PD)	Positive Contribution to PD	14
		Assisting in determining career plans	3
		Coping with difficulties	1

General Mentoring Process	Suggestions for the mentoring process	Face-to-face mentoring	3
		Increasing the meeting time	2
		Making observation	2
	Characteristics of a mentor	Experienced	7
		Willing	4
		Friendly	4
		Supportive	2
		Dedicated	1
	To participate in mentoring in the future	Willing	18

Findings on Mentor Interviews

Course Outcomes

In the theme of mentoring in theoretical courses, the participants generally had positive ideas (n=13). M16 expressed it as: "I think it is necessary for theoretical lessons because it is important how the course should be taught in order to convey the achievements to the students, that is, the teaching methods and techniques to be used to ensure the permanence of the information, even if it is theoretical, should be well conveyed to the preservice teachers." Some other participants (n=3) answered negatively. M1: "I think mentoring is not necessary for theoretical lessons. They can understand by reading. I do not think that mentoring should be conducted in the theoretical issues." According to the data obtained, mentors generally thought that e-mentoring is essential in theoretical courses.

Tools Used in the e-Mentoring

Most of the participants (n=7) stated Whatsapp and Zoom in the theme of tools used. M8: "We did it entirely on Zoom. At the same time, we continued to communicate via WhatsApp…" M11 expressed it as: "There is the Zoom that everyone knows. Preservice teachers also participated from there. Other than that, we didn't feel the need to use anything different…" The participants generally answered positively (n=12) in the theme that the mentoring process should be done through a single application. M2 expressed it as: "It would be nice if there were a platform where we could all communicate from the same place." M9 expressed it as: "It may be beneficial to transfer the files that we share with students on a regular and collective basis because they are taking notes and they are recording. I think it's important because it will be a reminder for them." Some of the participants (n=4) didn't want a single platform. One mentor stated, "I think a single platform may be restrictive." In the theme of platform features, some participants (n=4) highlighted chat, messaging, video chat, and material sharing. M2 expressed it as: "I can record lectures, conduct interviews, and share documents on that platform, and I can make announcements…" Some of the participants (n=3) described platform features such as "Sharing and downloading files." M8 expressed it as: "I think it would be more efficient if there were a system where preservice teachers could share their daily

plans and share those with all preservice teachers or be evaluated by other mentors." Accordingly, the mentors found it helpful to use their preferred applications in the process. However, they still think it would be more beneficial to carry out e-mentoring on a single application.

Problems Encountered

In the problems encountered theme, most of the participants (n=14) stated that they had no negative experience. M13: "We did not experience any adverse experiences." Some of the participants (n=2) had negative experiences. M3 expressed it as: "There were frequent power cuts due to the area I live in, so there were problems in our meetings.". In addition, all the participants (n=16) stated that the mentoring process was good. M2 expressed it as: "It was a positive experience for me that the mentees taught students at my school and interacted with them." Accordingly, the mentors generally did not experience any negativity. The only negative thing mentioned was regional power outages.

Future Career Experiences

In the theme of the effects of the mentoring process on professional development, some of the mentors (n=7) highlighted self-evaluation. M4 expressed it as: "I had an answer to 99% of the questions asked by mentees, but if they had asked these questions when I started my career, I would not have been able to answer 80%. So actually, my level was tested with them." Some mentors (n=6) highlighted sharing experience as an effect of the process. M3: "I received and shared the information and ideas of the mentees. We have a mutual responsibility. I prepared myself for them. I didn't improvise the lessons. I looked at that week's plan, and I worked on everything. It's been good for me too." In the theme of the contributions of the mentoring process, the participants mostly (n=13) indicated "Gaining Experience". M9 expressed it as: "The mentees have gained practical knowledge on the subject before they start their career. Therefore, I think it can be beneficial in orienting to their professions." In addition, as a suggestion, some of the participants (n=3) stated that all mentors should work in cooperation. M12 said: "Obviously, I would like to conduct the mentoring together with other mentors because I could gain something from them and give something to them. That way, we could have brought more benefits to the preservice teachers." In general, mentors had the opportunity to improve themselves in the e-mentoring process. However, they think that communication and cooperation with other mentors will be effective in developing the mentees and their development.

General Mentoring Process

Most of the participants (n=10) responded to the needed student characteristics in the theme of student characteristics as being interested in the profession. M7 expressed it as: "Students should be interested in the teaching profession. Otherwise, the mentees who do not want to be teachers attend the interviews only out of necessity and cannot achieve efficiency in our meetings." Some participants (n=3) expressed it as being willing. M5: "I think students should be open to teaching and learning. They must be enthusiastic. In other words, they must first learn this job from their master and coach." According to the data obtained, mentors expect students to be interested and willing to teach and learn.

In the experience that the mentoring process continues, all participants (n=16) gave positive thoughts to the participation theme. M9 expressed it as: "Yes, I would like to support preservice teachers because I would love to be in such a project when I was at university myself. In a critical application, being able to dominate these processes with graduates and having some knowledge will expand my perspective and guide me about the process." Similarly, M3 said, "Of course, I would like to participate because I enjoyed sharing my experiences with them, it was nice. I have a different experience every year. The experiences I will share next year will not be the same as what I have shared this year. I will add many different things to my experiences. I think that I can be helpful to the mentees in this respect as well…" From these statements, the

e-mentoring process was found to be beneficial in general, and the mentors stated that they would participate in the process if it continued in the future.

Table 4.

Findings on Mentor Interviews

Category	Theme	Code	f
Course Outcomes	Need for mentoring in theoretical courses	Need	13
		No Need	3
Tools Used in the e-Mentoring	Desired technological tools in mentoring	Whatsapp and Zoom	7
	Mentoring by a single tool	Insufficient	4
		Sufficient	12
	Features of a platform that can be used in mentoring	chat, messaging, video chat and material sharing	4
		Sharing and downloading files	3
Problems Encountered	Negative experiences	Not experienced negativity	14
		Experienced negativity	2
	Positive experiences	The Whole E-Mentoring Process is Positive	16
Future Career Experiences	The effects of the mentoring on professional development (PD)	Self-evaluation	7
		Sharing of experience	6
	Contributions of the mentoring	Gaining experience	13
		Working collaboratively	3
General Mentoring Process	Characteristics of a mentee	Be interested in the profession	10
		Willing	3
	To participate in mentoring in the future	Willing	16

DISCUSSION, CONCLUSION, RECOMMENDATIONS

The study obtained the mentors' and mentees' views and explored them in depth. The researchers discussed the findings under the following headings:

Course Outcomes

The study's first finding is that some mentees stated that theoretical lessons are beneficial for preservice teachers. In contrast, others feel there is no need for them. On the other hand, mentors generally think mentoring should be done in theoretical courses. They emphasize the importance of providing information on how the theory occurs in practice (e.g., innovative teaching methods). Cherian (2007) stated that mentoring composes a link between the knowledge acquired at school and the mentors' experiences. Preservice teachers can embody the abstract structure of theoretical lessons by benefiting from the mentors' knowledge. Therefore, they can have a more meaningful and permanent learning experience. Alemdağ (2015) found in her study that e-mentoring increases the field knowledge of both mentees and mentors. Mentees' statements also show that mentoring is very supportive in putting theory into practice and further increasing the permanence of theoretical knowledge. They found the process helpful in applying micro-teaching after theoretical subjects. They learned a lot about what to do in the absence of the necessary materials and tools. In addition, the mentees drew attention to the fact that they provided mutual development with the preservice teachers, owing to the sharing of ideas and information. On the other hand, mentors could come to recognize the point they had reached in their professional knowledge by thinking clearly about students' questions.

Tools Used in e-Mentoring

Various tools were used throughout the mentoring process. Mentors and mentees used mobile phones, Zoom, Whatsapp, and Google Meet to hold meetings. Also, they used Google Drive for sharing content. The tools used were sufficient to ensure interaction. In addition, the participants stated that they benefited from EBA, YouTube, Canva, Quizizz, Magic with Code and Scratch applications. Some suggested that e-mentoring might be carried out through a single website, while others felt there is no need to design a platform for this process. Accordingly, for a smoother process, a valuable and practical online platform may be created, including live recordable lessons, a chat application, a form system to receive students' opinions, a blog system to write articles on contents, and a system to share documentation. In addition, ensuring a notification system where new tasks are constantly announced and suggestions are presented will be beneficial. Mentors generally emphasized that a single platform would allow mentees to take better notes and increase permanence by sharing files regularly and collectively. On the other hand, some mentors suggested that a single platform might be restrictive. In addition, they stated that an environment where mentors can share their daily plans and where mentors and mentees can evaluate other mentees would be beneficial.

Problems Encountered

Participants experienced few disruptions in e-mentoring. Some mentors forgot the meeting and some didn't give feedback on the mentees' prepared content. It is important that mentors are not indifferent to the process if it is to be efficient. They need to be aware that they are in a supportive position and sometimes make sacrifices. Also, successful e-mentoring should include volunteer mentors. The mentors' willingness to help mentees may positively affect students' motivation to listen, ask questions, and progress. Ersin and Atay (2021) and Karadağ (2015), in a face-to-face mentoring study, found that mentors' insufficient participation. Karadağ (2015) specified that this was due to the mentors' workload. However, their business may negatively affect the mentor-mentee interaction in the e-mentoring environment (de Janasz, & Godshalk, 2013). On the other hand, Çetin (2013) found that, despite mentors' workloads, mentees gained valuable experiences in their professional development. Finally, mentors stated that the process became difficult from time to time due to rare power outages. For this, mentors could inform mentees at the beginning of the e-mentoring about the possibility of power outages and conduct a risk assessment.

Future Career Experiences

Mentees have gained knowledge about vital and unnecessary issues in their professional life. By understanding in advance the difficulties they may experience in their profession, they had the opportunity to develop beforehand essential methods to overcome them. In addition, they gained new ideas about how they can benefit from undergraduate education for better professional development.

During the process, mentees had the opportunity to make a career plan. They clarified their decisions to continue in the profession. Similarly, Kahraman (2012) found that e-mentoring contributes to creating a career plan. Tolbert (2008) stressed that e-mentoring increases preservice teachers' confidence. Being sure about the future will also reduce preservice teachers' anxiety (Bursal & Paznokas, 2006) and positively affect their skills (Sepet, 2020; Yeşilfidan, 2019). In the current study, mentors found e-mentoring helpful for preservice teachers to get practical information about their profession and what to do before starting their careers. According to Yeşilfidan (2019), mentees can also benefit from up-to-date information about their mentors' jobs.

General Mentoring Process

Mentees and mentors had a positive attitude toward the mentoring process. Mentees generally participated in the meetings. While some mentees suggested increasing the e-mentoring interview times, others emphasized they prefer face-to-face mentoring. In addition, they stated that it would be beneficial to observe the mentors in their classes. Also, mentors found the mentee interactions with the students in the classroom helpful. This interaction could increase the mentee's professional interest. If mentors participate only out of necessity, the efficiency of the process would be low (Cherian, 2007).

Mentors with different years of experience were employed in the study to ensure diversity. The findings show that teaching experience is vital for mentoring, and people with many years of experience provide significantly different mentoring experiences. In addition, e-mentoring may increase mentors' leadership skills and professional motivation (Yeşilfidan, 2019). Mentors will provide more valuable support to the mentees by improving their experience in the process. McKimm, Jollie and Hatter (2007) emphasize in their examination of the characteristics of a good mentor that mentors should have sufficient professional experience and have the necessary competencies to be supportive. In addition, it will be beneficial for all mentors to work in cooperation with each other in terms of sharing their experiences. Finally, mentees and mentors want to participate in the mentoring process if it continues. Since the theory and practice are different for professional life, it would be beneficial to close this gap as soon as possible with e-mentoring.

As a result, the e-mentoring process was beneficial and contributed to transferring experience and mentee interest in the profession. Mentoring in theoretical courses is considered partially necessary. In addition, the mentoring process impacted professional development, learning to cope with difficulties, developing practical knowledge, and career planning. In addition, the participants indicated that the qualities of the mentor (teachers) should include willingness, sincerity, supportiveness, and being experienced in order to provide better experiences in the mentoring process. The participants used various tools throughout the process. Some suggested a partial platform designed to carry out the mentoring process through a single environment. Participants would like to participate if the mentoring process continues.

Sharing expert experience with preservice teachers is critical in developing their professional knowledge. This can also contribute to the attitudes and habits of preservice teachers' teaching skills (Felten, 2013), which are crucial for developing their professional knowledge (Briscoe, 2019). This study has significantly contributed to a process that can increase preservice teachers' theoretical and practical skills, improve their professional

knowledge about their future teaching, and develop positive attitudes toward the profession. In addition, mentors help preservice teachers to be more prepared for the setbacks they may encounter in the future. Mentors transferred their experience through the mentoring process, increased mentees' interest in the profession, and obtained information about practical activities for their school students. Education stakeholders and planners should consider further integrating mentoring into teacher education. In addition, they should investigate ways to make the best use of the advantages of electronic media.

Limitations and Future Studies

1- Researchers conducted a one-term e-mentorship. Future studies could make longer-term and regular applications.

2- This study did not use a specific tool. It may be useful if mentors and mentees could choose the most comfortable technical environment. While some participants found the program sufficient, others argued that a special system could be developed. In this regard, Yeşilfidan (2019) developed a web-based application and Alemdağ (2015) used the social networking software Buddypress. However, it will be valuable to examine the effects of all the environmental components and add new elements by taking participant opinions. Sun et al. (2008) emphasize that design in online education has important effects on the success of the learning process. In future studies, researchers could develop one or more tools specific to e-mentoring and examine the effects of that tool components such as messaging, sharing, interface properties, and notification.

3- Since e-mentoring occurs on the internet, future studies may examine the effects of internet usage preferences and related individual variables such as internet knowledge or attitude on e-mentoring.

4- A regular mentoring system including a mentor database would be beneficial. With this database, teacher educators could follow mentors' experience processes. Also, mentors may track and develop their experiences according to the available data.

5- Teacher educators could create standardization for e-mentoring to avoid problems (Yeşilfidan, 2019). Researchers should consider arranging the process and the materials used in the e-mentorship in the most efficient way with more experiments.

Author Note

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Ethical Statement and Conflict of Interest

Scientific ethical principles and rules were taken as the basis in all stages of this research, including preparation, data collection and analysis, and reporting. The ethical standards and conditions of the Committee on Publication Ethics (COPE) have been accepted and acted accordingly. The study did not receive funding from an institution or organization. There is no conflict of interest in the article.

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