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Investigation into Pre-service Teachers' Perceptions of Distance Education in the Context of Their Future Profession

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ABSTRACT

The objective of this research is to assess whether the distance education experiences of pre-service teachers currently undergoing higher education differ according to specific variables. These variables relate to the distance education processes instituted following the COVID-19 pandemic and the earthquakes that took place in Maraş and Elbistan on February 6, 2023. The study also endeavors to discern the impact of distance education on pre-service teachers' attitudes toward the teaching profession. Employing a mixed methodology, the research engaged a sample of 300 students from varying departments at Kırşehir Ahi Evran University during the 2022–2023 academic year, all of whom were participating in pedagogical formation courses via distance education. The quantitative data for the research was compiled using the "Pre-service Teachers' Perception of Distance Education Scale" developed by Gündüz (2013). Additionally, qualitative data was gathered from 50 volunteer pre-service teacher students engaged in pedagogical formation education using a semi-structured interview form designed by the researcher. An analysis of pre-service teachers' attitudes toward distance education and their chosen profession was conducted based on data derived from the scale. Quantitative data was processed with SPSS 25, while qualitative data was analyzed via the MAXQDA 2020 program. Quantitative analysis revealed that pre-service teachers' perceptions of distance education did not significantly differ in relation to gender, personal computer ownership, or field of study. However, differences were observed in relation to their internet connection status. Qualitative analysis generated sub-themes under the Distance Education theme, such as the Student in Distance Education and the Features of Distance Education.

Keywords:

Technological leadership, professional development, school principals

1. Introduction

The coronavirus pandemic has profoundly altered life on a global scale, forcing individuals and societies to adapt and endure unprecedented changes and challenges, especially in the economic and educational sectors. As the pandemic necessitates innovative solutions for educational reform globally (Işık & Bahat, 2021), our country has adopted a distance education model to preserve educational continuity and support learners' ongoing progress (Telli Yamamoto & Altun, 2020). However, given the novel situation, it is imperative to enhance educators' competencies to achieve objectives and uphold quality in contemporary education (Işık & Çetin, 2019). The effectiveness of distance teaching and learning technology, tools, and methodologies depends largely on the competencies of the teachers (Çetinkaya Aydın, 2020). For the expected outcomes from education to be realized, stakeholders in distance education, including educators and digital learning environments, must be well-equipped with the necessary knowledge and resources. Understanding that students will continue their education from home for the foreseeable future, there is an urgent need to expedite their adaptation to the digital learning environment and increase technological proficiency among all involved, especially school administrators, teachers, and students (Işık & Bahat, 2021).

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On February 6, 2023, Turkey faced one of its most substantial earthquake disasters. Given their unpredictability and destructive power, earthquakes significantly disrupt communities, particularly in the areas of transportation, health, and education (United Nations, 2010; Mavrouli et al., 2023). In the post-earthquake period in Turkey, emergency distance education has been evaluated as an important tool that will enable students to continue their education without interruption (Telli & Altun, 2023).

In the aftermath of such a disaster, it is critical to quickly devise response strategies to address potential problems arising from hampered access to transportation, health services, and education (Guerin-Marthe et al., 2021; He, 2021). Distance education practices, already on the rise during the COVID-19 pandemic, were rapidly adopted following the Maraş earthquake on February 6, 2023. Teachers' technological competencies have proven crucial for successful distance education during this period. A teacher's perception of distance education is positively influenced by an affinity for technology and negatively affected by technophobia (Başak & Çakmak, 2020). Consequently, the perceptions and experiences of pre-service teachers concerning distance education hold significant importance in the field of education (Demirbilek, 2021).

Education, regarded as the pivotal instrument that propels individual and societal change, plays an essential role in shaping the socio-cultural, economic, and technological needs of societies and nations while preparing individuals for all aspects of life (Işık & Bahat, 2021; Tekke, 2019). The swift advancement and expansion of technology in the present day have brought about substantial alterations in the education sector. Distance education, which enables students and teachers to continue their educational activities without occupying the same physical space, is one of the foremost manifestations of these changes (Simonson, Smaldino, Albright, & Zvacek, 2012). While subject-specific knowledge and communication skills may suffice in traditional educational environments, distance education requires teachers to possess technological competencies in addition to these skills (Başak & Çakmak, 2020). The use of interactive technology mirrors the professional experiences of pre-service teachers (Clark & Mayer, 2016). Pre-service teachers exploit communication and interaction opportunities through technology in their educational processes, thereby facilitating a more effective learning process (Gülbahar, Kert, & Kalelioğlu, 2019). Technology aids in the continuous growth and reflection of teaching practices by providing pre-service teachers with access to professional development opportunities and participation in lifelong learning (Herrington, Reeves, & Oliver, 2010).

Pre-service teachers' experience of distance education is molded by factors such as technology usage, motivation, learning strategies, and learning management (İbicioğlu & Antalyalı, 2005; Karatas Öztürk, 2021). The opportunity to use computers, motivation, and perception of distance education are of primary importance in success in distance education (İbicioğlu & Antalyalı, 2005). It should be recommended that distance education be used as a solution in cases of necessity (Karatas Öztürk, 2021). Moreover, both intrinsic and extrinsic motivations significantly impact pre-service teachers' distance education experiences (Demirbilek, 2021; Karatas, 2020). Proficiency in technology usage is perceived as a motivational driver in distance education and is a critical component of pre-service teachers' distance education experience (İbicioğlu & Antalyalı, 2005). Therefore, the distance education model holds considerable significance, particularly for pre-service teachers. While distance education provides learning opportunities, it may be deemed insufficient by many students due to its reduced student-teacher interaction compared to in-person education. Consequently, it is critical to explore pre-service teachers' perceptions and viewpoints concerning their experiences with distance education and its impact on the teaching profession. This research is original in that it has not been studied on the distance education experiences of teacher candidates and their effects on their perceptions of the teaching profession.

This study aims to ascertain the experiences of pre-service teachers during their higher education in the context of distance education and whether these experiences differ based on gender, program of study, ownership of a personal computer, and access to an internet connection. With these objectives in mind, the following sub-objectives have been established:

- a) What are the perceptions of pre-service teachers regarding distance education?
- b) What are the experiences of pre-service teachers in distance education?
- c) What are the effects of pre-service teachers' perceptions and experiences of distance education on their professional development?

This study probes the perceptions of pre-service teachers who took part in distance education following an earthquake, based on their views concerning the impact of the distance education process. The objective is to uncover the experiences of pre-service teachers in distance education and their perspectives on the teaching profession. The results of this study are anticipated to inform the development of future regulations for distance education.

2. Methodology

2.1. Research Model

The study's goal is to explore the perceptions of pre-service teachers regarding the impact of distance education and their experiences in relation to the teaching profession. This design was used in the study to determine the two-way effects of prospective teachers' distance education experiences on their perception of the teaching profession. This research approach was preferred to simultaneously access quantitative data on distance education and qualitative data on professional development. Thus, a mixed-methods research design was utilized to provide comprehensive insights about the experiences of pre-service teachers in distance education and their views of the teaching profession. "Mixed methods research is an approach that combines quantitative and qualitative data or techniques" (Christensen, Johnson, & Turner, 2015). The research was configured in a sequential explanatory pattern, signifying that both quantitative and qualitative research data are equally valued, with the quantitative data gathered first, followed by the qualitative data (Creswell, 2003; 2015).

2.2. Research Sample

The study's quantitative data was collected using the "Perceptions of Pre-service Teachers towards Distance Education" scale developed by Gündüz (2013). The scale was administered to 300 (211 female, 89 male) students from various faculties other than the Faculty of Education at Kırşehir Ahi Evran University. The population of the research consists of students participating in the teaching certificate program from different departments of Ahi Evran University in the 2023–2024 academic year. Apart from the students of the faculty of education, 300 of the 320 students in the teaching certificate program who participated in the research constitute the sample of the research. These students were in their final year and had experienced distance education during the pandemic and following the February 6th earthquake. The scale was administered via Google Forms. The sample selection for the study was guided by the Council of Higher Education's (YÖK) decision for the 2022-2023 academic year. According to this decision, final-year university students could commence elective courses in the spring semester upon written request to their universities. These students could undertake their courses, including teaching practices, in the spring semester, summer term, or first semester of the 2023–2024 academic year (YÖK, 2023).

For the qualitative data, a purposive sampling method known as "maximum variation sampling" was employed. This method aims to create a relatively small sample that maximizes the diversity of individuals who can contribute to the research problem (Yıldırım & Şimşek, 2016). The participants for the qualitative portion of the study were chosen from students from different departments of various faculties who started their pedagogical formation education after the YÖK decision.

The qualitative part of the study involved the voluntary participation of 50 students among the quantitative research participants. The ages of the participants ranged from 20 to 26, with 34 females and 16 males. The majority of participants come from families with a monthly income level above 9000 TL, and half of the students have a monthly income between 1000-2000 TL, while others have a monthly income exceeding 2000 TL. The participants willingly took part in the research, and the sampling was conducted using the maximum variation sampling technique (Patton, 2015). The objective was to assemble a relatively small sample that maximizes the diversity of individuals who can contribute to the research problem by selecting students from each department participating in pedagogical formation education across all faculties other than the Faculty of Education.

Table 1. Demographic Characteristics of Participants

Variable	Variable subgroup	Number	Percent
Gender	Female	34	% 68
	Male	16	% 32
Age	21 years	1	% 2
	22 years	18	% 36
	23 years	18	% 36
	24 years	6	% 12
	25 years and over	7	% 14
Number of siblings	Single child	2	% 4
	2 siblings	9	% 18
	3 siblings	17	% 34
	4 siblings	12	% 24
	5 siblings or more	10	% 20
Mother education level	Primary School	30	% 60
	Secondary School	9	% 18
	High School	8	% 16
	Undergraduate Degree	2	% 4
	Postgraduate Degree	1	% 2
Father education level	Primary School	19	% 38
	Secondary School	14	% 28
	High School	8	% 16
	Undergraduate Degree	9	% 18
	Postgraduate Degree	-	-
Family income level	0-3000 Turkish Liras (TL)	-	-
	3001-5000 TL	2	% 4
	5001-9000 TL	9	% 18
	9001-12000 TL	19	% 38
	12001 TL and above	20	% 40
Student monthly income	1000 TL and below	3	% 6
	1001-2000 TL	27	% 54
	2001-3000 TL	10	% 20
	3001 TL and above	10	% 20

2.3. Data Collection Tools and Procedure

The quantitative aspect of the study utilized the "Scale of Pre-service Teachers' Perceptions of Distance Education" developed by Gündüz (2013) as a data collection tool. The reliability coefficient of the scale, as calculated using Cronbach's alpha, was found to be 0.84, with a validity coefficient of 0.83. The scale is structured into two sections. The first section includes personal information, including the participant's field of study, gender, and whether they have a personal computer and internet connection. The second section comprises statements related to distance education, which are evaluated on a Likert scale, ranging from "Strongly Agree," "Agree," "Undecided," "Disagree," and "Strongly Disagree." Positive statements are scored from 1 to 5, while negative statements are reverse-scored. Explanations were provided during the administration of the scale, and any data with missing values or potential to impact the research outcomes were omitted from the analysis.

The qualitative portion of the study employed a semi-structured interview format to delve into the perceptions and experiences of pre-service teachers regarding distance education. The interview questions touched upon topics such as their experiences during the distance education process and its influence on their professional development as teachers (Merriam & Tisdell, 2015). The semi-structured interview format was developed by the researcher based on the views of pre-service teachers, aiming to determine the effects of distance education on their perspectives towards the teaching profession. A literature review was conducted to frame the question, "What are your thoughts on the effects of distance education on the teaching profession?" Two experts in the field of educational sciences with doctoral degrees and two faculty members who teach

pedagogical formation courses determined the scope of the research. The research questions were formulated in alignment with the "Scale of Pre-service Teachers' Perceptions of Distance Education."

2.4. Data Analysis

This research was conducted with the approval of the Ethics Committee. The Kırşehir Ahi Evran University Committee for Social and Human Sciences Ethics approved the research with the decision number 2023/05/13 on June 14, 2023, confirming the ethical appropriateness of the research. The measurement tool used in the study was Gündüz's (2013) scale, which was administered to a sample of pre-service teachers at Kırşehir Ahi Evran University during the fall semester of the 2022-2023 academic year via a Google Form.

For the qualitative section, following the principle of voluntarism, semi-structured interviews were conducted with pre-service teachers enrolled in pedagogical formation courses. These face-to-face interviews each lasted between 20 and 30 minutes. The quantitative and qualitative data sets were independently collected from different sources, and their analyses were separately conducted.

Quantitative Data Analysis

The survey model, a method within the quantitative research paradigm, was used for this study, and the "Scale of Pre-service Teachers' Perception of Distance Education" developed by Abdullah Yasin Gündüz was employed. Descriptive statistics techniques, including percentages and frequency distributions, were used in analyzing the quantitative data. Additionally, parametric analyses such as independent samples t-tests, one-way analysis of variance (ANOVA), two-way analysis of variance, and Post-Hoc (LSD) tests were performed to evaluate the data.

Qualitative Data Analysis

The "maximum variation sampling" method, a purposive sampling technique, was used for the qualitative data in this study. Participants were selected based on their department affiliations, ensuring diversity in the sample. The data were then analyzed using content analysis. The principal objective of content analysis is to derive concepts and relationships that can explain the collected data. The themes or categories of the research can be constructed by the researcher during the data analysis process (Yıldırım & Şimşek, 2016). In this study, transcripts of the interviews were prepared initially, followed by coding, and finally, the development of themes and categories for interpretation of the results.

To neutrally observe the phenomenon of distance education within the scope of the research, the interview texts were read twice. In order to maintain the validity of the research, care was taken to use the participants' own words and phrases. The credibility of the research was ensured by including direct quotes from the pre-service teachers' opinions. Including direct quotes from the interviewees is crucial for explicating the results in descriptive analysis research (Yıldırım & Şimşek, 2016). In the data analysis, themes and codes were grouped based on similarities and differences to identify the commonalities and differences among the opinions of the pre-service teachers, in line with the themes defined in the research, and the findings were interpreted. Additionally, pseudonyms such as G1, G2, G3, etc. were used instead of the participants' real names.

2.5. Ethical

Ethics committee approval: This study was reviewed and approved by the Kırşehir Ahi Evran University Social and Human Sciences Scientific Research and Publication Ethics Committee approval decision numbered May 13, 2023.

3. Findings

This chapter includes the data and the findings obtained through data analysis. The findings derived from the "Perception of Distance Education" scale are discussed under two separate headings, and the findings resulting from interviews with pre-service teachers are presented.

Table 2. Normality Distribution (APA) Table Representation

	N	X	Median	Skewness	Kurtosis	p
Total	335	2.87	2.90	-.01	-.69	.01

Table 2 presents the total kurtosis and skewness values of the distance education scale. According to Büyüköztürk (2007), the proximity of the mode, median, and arithmetic mean to each other signifies a normal distribution of the data. The skewness (-.01), kurtosis (-.69), skewness and kurtosis values in the distance education scale are seen to be close to each other, thus meeting the normality assumption. As per Büyüköztürk (2007), for data to exhibit a normal distribution, the kurtosis and skewness values should range between +1 and -1.

This section displays the demographics of the pre-service teachers participating in the study, including gender, department, class level, possession of a personal computer, and internet connectivity status, as summarized in Table 2.

Table 3. *Descriptive Statistics of Pre-service Teachers Participating in the Study*

	Variables	Frequency (f)	Percent (%)
Gender	Female	250	74,6
	Male	85	25,4
Field of Study	Health Sciences	139	41,5
	Social Sciences	115	34,3
	Science	81	24,2
Personal Computer Presence	Yes	260	77,6
	No	75	22,4
Availability of Internet Connection	Yes	266	79,4
	No	69	20,6
	Total	335	100,0

Upon examining Table 3, it is found that 250 (74.60%) of university students are female, while 85 (25.40%) are male. The fields of study for the participants are Health Sciences with 139 (41.50%) students, Social Sciences with 115 (34.30%) students, and Science with 81 (24.20%) students. When considering the status of personal computer possession among the students, 260 (77.60%) are found to own a personal computer, while 75 (22.40%) do not. Analyzing the responses regarding internet connectivity, it is observed that 266 (79.40%) students have internet access, while 69 (20.60%) do not.

Table 3. *T-test of students' views on distance education by gender*

Dimension	Groups	N	X̄	ss	t	sd	p
Total Score	Female	250	2,84	.83	-.84	333	.39
	Male	87	2,93	.82			

As shown in Table 3, no significant difference is observed at the .95 confidence interval in the total score level of the distance education scale relative to the gender variable.

Table 4. *T-test Based on Whether Pre-service Teachers' Views on Distance Education Include Personal Computer Ownership or Not*

Dimension	Groups	N	X̄	ss	t	sd	p
Total Score	Yes	260	2,91	.82	1.80	333	.07
	No	75	2,72	.82			

Table 4 illustrates that there is no significant difference at the .95 confidence interval in the total score level of the distance education scale concerning whether students own a personal computer or not. This could be attributed to students accessing online platforms using smartphones, apart from personal computers, during the distance education process. The research finding suggests no significant correlation between the pre-service teachers' perceptions of distance education and personal computer ownership.

Table 5. *T-test of Students' Views on Distance Education Based on Internet Connectivity Status*

Dimension	Groups	N	X̄	ss	t	sd	p
Total Score	Yes	266	2,96	.79	3.92	333	.00
	No	69	2,52	.75			

As illustrated in Table 5, there exists a statistically significant difference at the .95 confidence level in the total score level of distance education among university students based on their internet connection status ($t(335)=3.92$). Students with an internet connection ($M =2.96$) possess a higher total score level compared to students without an internet connection ($M =2.52$). This suggests that students with an internet connection perceive distance education more positively than those without. The research finding could be interpreted to indicate a significant correlation between pre-service teachers' perceptions of distance education and their internet connectivity status.

Table 6. ANOVA of Students' Views on Distance Education According to Their Fields of Study

Dimension	Groups	<i>n</i>	<i>X</i>	<i>SS</i>	<i>sd</i>	<i>F</i>	<i>p</i>
Total Score	Health Sciences	139	2,8291	,89	334	.639	.52
	Liberal arts	115	2,9417	,75			
	Science	81	2,8438	,81			
	Toplam	335	2,8713	,82			

As shown in Table 6, there is no significant difference at the .95 confidence interval among the groups in the total score level of the scale concerning distance education. The research finding could be interpreted to mean that students' views on distance education do not vary according to their fields of study.

Qualitative Findings

This section discusses the views on the impact of pre-service teachers' distance education experiences and their perceptions of distance education on the teaching profession. Data obtained from in-depth interviews conducted to understand pre-service teachers' experiences in the context of distance education and their perceptions towards the teaching profession resulted in the theme "Distance Education." This theme incorporates the sub-theme "Student in Distance Education" with associated codes of "Perception," "Expectation," "Attitude," "Need," "Personal Characteristics," "Socialization," and "Technological Competency". Furthermore, the sub-theme "Features of Distance Education" was identified with the codes "Effectiveness," "Efficiency," "Equipment," "Accessibility," "Flexibility," "Comparison," "Effect of the Instructor," and "Reflections on Teaching Skills".

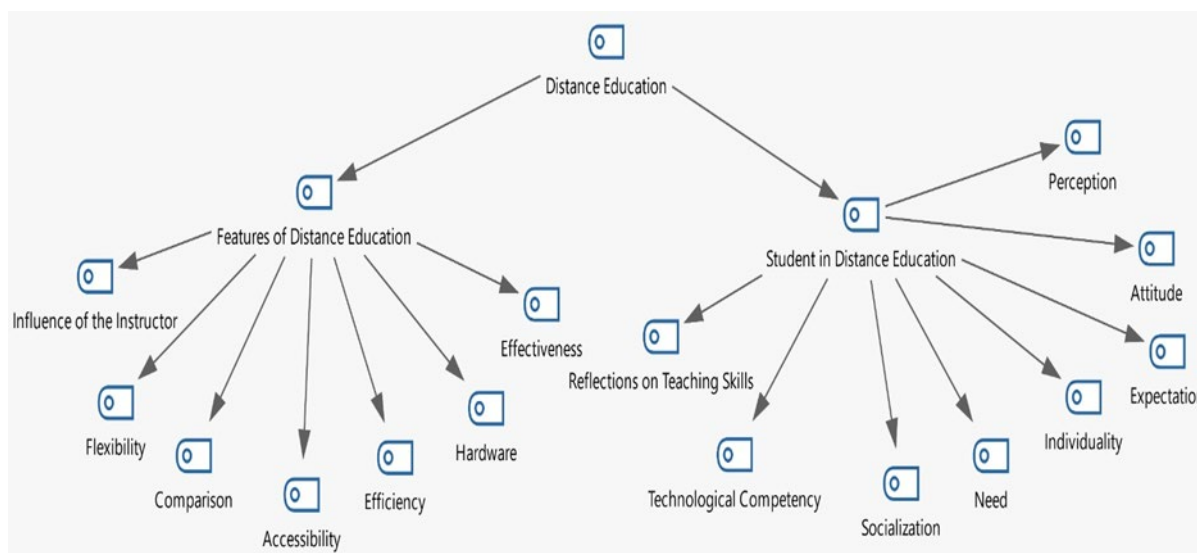


Figure 1. Distance Education

1. Student in Distance Education

Pre-service teachers participating in the study generally perceive the distance education process, implemented due to various challenges, to negatively impact teaching. According to students, distance education does not fulfill their expectations and needs. However, it is acknowledged that distance education has enhanced the technological competencies of higher education students. Pre-service teachers find distance education

preferable considering its temporal and spatial flexibility and economic benefits. The theme "Student in Distance Education" was derived from responses to questions directed to determine pre-service teachers' perceptions and experiences towards distance education.

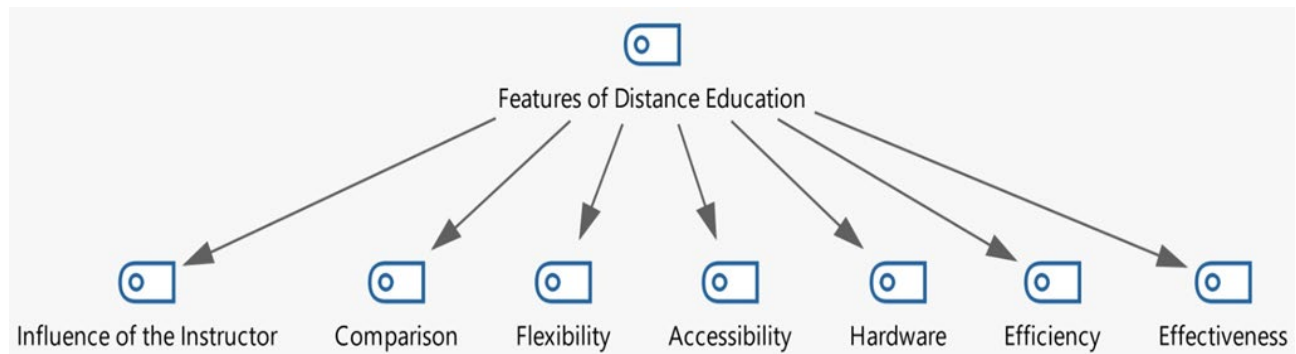


Figure 2. Features of Distance Education

a. Perception

According to the pre-service teachers, the distance education process adversely affects teaching and lacks the effectiveness and efficiency of traditional face-to-face education, failing to meet student expectations and needs. However, positive perceptions related to distance education indicate its role in improving students' technological competencies.

"I believe that distance education should not stand as a separate entity." (P 25).

"In education, I am of the belief that distance education should be minimal and perhaps relegated mostly to theoretical courses." (P 18).

"I do enjoy the flexibility of managing my time with distance learning, although I acknowledge the setback is a diminished scope for developmental learning." (P 42).

b. Expectation

According to pre-service teachers, distance education does not fulfill students' expectations towards the teaching profession, particularly in higher education. Despite technological advancements, distance education fails to meet the expectations satisfied by face-to-face education. While students believe that theoretical courses can be held online, they argue that conducting practical courses online may have negative implications in the future.

"I don't envision distance education ever truly supplanting face-to-face instruction. While it may progress, I fear that its evolution could yield more detrimental than beneficial outcomes." (P 5).

"That said, I am supportive of online classes for certain courses, specifically those with theoretical content." (P 17).

"As a future educator, I plan to integrate technological tools and applications into my teaching practice." (P 30).

c. Attitude

The attitudes of higher education students are shaped by their perceptions, thoughts, and approaches to education. The pre-service teachers indicated that their commitment and responsibility towards class participation, studying, motivation to learn, efficient and effective listening, reading, and researching are somewhat diminished in distance education compared to traditional, face-to-face instruction. Participants highlighted difficulties in adhering to class schedules, maintaining focus, comprehending the material, and revising. These challenges were reported to contribute to learning losses.

"The student can engage better in lessons when diverse topics are covered. Otherwise, the student risks losing interest and might disengage from the lesson. Many just log in to the class and proceed to mute it, contributing little or nothing to the class." (P 5).

"I perceive a misuse of distance education, where students merely appear to be present. I regard distance education as highly inefficient and firmly support face-to-face education." (P 43).

"To be completely honest, I sometimes sleep during class hours, occasionally leaving the class running in the background." (P 46).

d. Need

According to the pre-service teachers, there is a palpable need for practical experience pertaining to the teaching profession within distance education. Participants expressed difficulties and perceived deficits in actively engaging in courses, having mutual conversations, clarifying misunderstandings or gaps in knowledge, and remedying the deficiencies inherent in distance education.

"I have personal deficiencies during the distance education process. If I can overcome my nervousness, I could express myself more effectively." (P 3).

"The distance aspect creates a deficiency because we cannot receive as much from our instructors. The process is somewhat lacking due to this distance." (P 21).

"I intend to bridge the gap resulting from a lack of practice through my own efforts: learning independently, observing my peers, and striving to improve in this manner." (P 48).

e. Individuality

The personal characteristics of students, such as shyness, lack of self-confidence, irregularity, and lack of responsibility, according to participating pre-service teachers, negatively influence their study habits, class participation, and focus during distance education.

"In distance education, I haven't seen a negative impact on myself. However, if I were a more self-conscious person, we wouldn't be able to learn much from our instructors." (P 2).

"I am self-critical, as I tend to hesitate to answer questions in class due to my shyness." (P 15).

"In distance education, I confess I've become incredibly lazy, irresponsible, and disorganized. The convenience has led to irregular class participation and overall laziness. Unfortunately, I can't say it has been an additive experience." (P 37).

f. Socialization

Pre-service teachers believe that distance education hinders the students' ability to socialize, which is one of the main expectations of higher education. Students note that social and academic development are positively impacted when they can interact with their peers inside and outside of class. However, they also highlight that having to undergo distance education for two out of their four years of higher education due to the pandemic and earthquake has failed to meet their expectations for academic, personal, and social life experiences.

"The advantage of traditional education is primarily socialization. Moreover, it provides the benefit of self-discipline in the academic realm, which I find incredibly advantageous." (P 7).

"Frankly, online education tends to induce antisocial behavior." (P 31).

"With face-to-face education, there are more opportunities to socialize, meet new people, and enjoy a relaxed psychological state. You can focus more effectively, and from a learning perspective, I prefer face-to-face education." (P 50).

g. Technological Proficiency

The pre-service teachers participating in the study indicated that their most significant positive takeaway regarding distance education came from the improved technological proficiency. They reported an enhancement in their technology skills due to the necessities of the distance education process. They also

believe this will enable them to adapt more quickly and seamlessly to the integration of technology in their future teaching practices.

"I struggled initially with the technology, but I've improved dramatically, learning to use the computer more effectively." (P 19).

"When I become a teacher, I plan to incorporate technological tools and applications into my teaching. This is one of the benefits of distance education for me: the ability to better utilize technology. Through distance education, I've learned things I didn't previously know, and I aim to pass this knowledge on to my students." (P 26).

"The benefits of distance education are considerable, in my view. Without it, I don't believe I could have become as proficient with technology as I am now." (P 43).

h. Reflections on Teaching Skills

The pre-service teachers participating in the study noted that their two-year experience with distance learning leads them to believe they may encounter challenges in their future teaching profession, especially given the lack of practical application.

"Distance education has negatively impacted my preparedness for my future profession. We ended up with more theory-focused lessons in distance education." (P 4).

"I anticipate difficulties with the practical aspects of teaching in the future. Our instructors serve as role models for us, but in distance education, we don't get to observe them as much." (P 43).

"Distance education will negatively impact my future profession as I am a practical learner. I learn better when the teacher physically demonstrates something on a map or through other hands-on methods. For me, distance education, which mainly involves sitting at a desk and listening, isn't as effective." (P 44).

2. Features of Distance Education

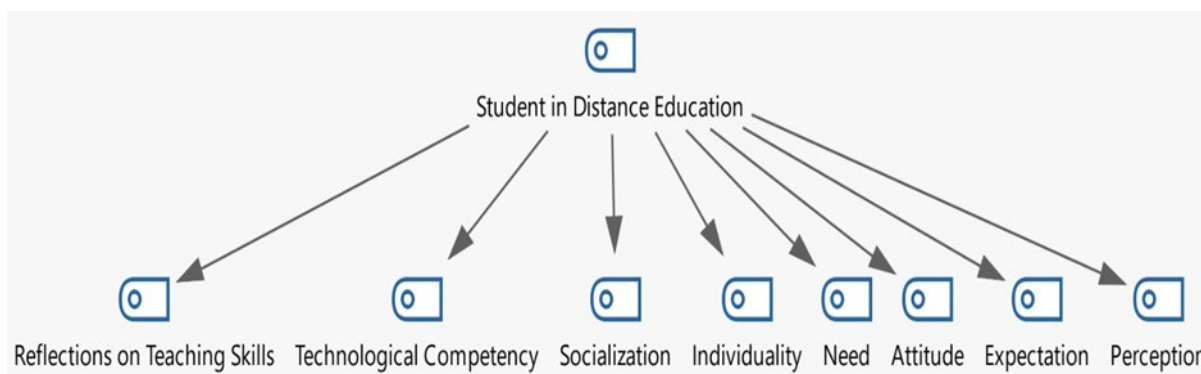


Figure 3. Student in Distance Education

Analyzing the responses of the participating pre-service teachers led to the identification of the "Features of Distance Education" theme. This theme encompasses several codes, such as "Effectiveness," "Efficiency," "Equipment," "Accessibility," "Flexibility," "Comparison," "Effect of Instructor," and "Reflections on Teaching Skills." Upon reviewing the pre-service teachers' views, it becomes apparent that distance education, when compared to face-to-face education, is seen as less effective and efficient. However, students do acknowledge that distance education provides advantages in terms of accessibility and flexibility. The participants also highlighted that the quality of distance education significantly depends on the instructor's skills and that it will undoubtedly impact their future teaching practices.

"I perceive distance education as more harmful than beneficial. For me, distance education is challenging and, frankly, an illogical process. I don't believe I've derived any benefits from it." (G 4).

"I think distance education is an advantage. In distance education, I have my technological tool, a computer; there are many books that we can access; and the library environment is also present in the virtual environment, just like in the real world." (G 25).

"Generally, I don't find distance education to be efficient." (G 26).

a. Effectiveness

According to the participants, the effectiveness of distance education is negatively influenced by students' lack of motivation, low participation, and disengagement during courses. They believe that both students' attitudes and behaviors and the instructor's course delivery method contribute to the effectiveness of distance education.

"I see no positive innovation in distance education; there are many shortcomings, and it continually frustrates students." (G 4).

"Distance education is nowhere near as effective as face-to-face education. It is challenging for students to maintain focus and engage in lectures." (G 12).

"Learning applications or lessons are more interactive when conducted in person. As you know, online interaction is quite limited." (G 39).

b. Efficiency

The participants have expressed that the efficiency of distance education is negatively impacted due to reduced engagement and the difficulty of immediate clarification of doubts, which is more feasible in a face-to-face setting.

"In a face-to-face setting, it is generally more comfortable to ask questions and contribute meaningfully to the class discussion. There's a tangible immediacy and ease in interaction that stems from the presence of verbal cues and face-to-face engagement, enhancing understanding and enjoyment of the course. However, in distance education, the dynamics change, often leading to problems in participation." (G 16).

"I believe distance education is highly inefficient." (G 37).

"Distance education is very inefficient because we have this in a few of our classes; the sound is cut off. We tell the teacher this, but our sound is not on; it's locked. Our voice doesn't go to the other side; that class is wasted; it becomes very inefficient. We have technical problems; there are problems arising from the infrastructure." (G 1).

c. Equipment

According to the participating pre-service teachers, the availability of technological resources, their quality, and the proficiency of the students in utilizing these tools considerably influence the learning outcomes in distance education. Pre-service teachers access their distance education courses through various devices, including mobile phones, tablets, and computers.

"In distance education, I use a phone, laptop, and tablet as my primary technological tools" (G 29).

"I use my phone for distance education, especially when following a lecture or conducting research for a course." (G 45).

"I mainly use a computer as a technological tool for distance education. Occasionally, I also use my phone." (G 48).

d. Accessibility

Participants' perceptions and experiences with distance education were seen to be influenced by their ability to access courses, technological infrastructure, and internet connectivity. They indicated that limitations on these aspects negatively impact their participation in and success with their courses.

"There are students living in rural areas without reliable internet access. Though in theory everyone has equal opportunity to attend university and access courses, this is not always the case in practice." (G 7).

"Internet connectivity is a significant issue. The disparity between face-to-face communication and remote communication is vast. There's a difference between interacting with a person in the same environment and listening to them in a video format." (G 11).

"Due to internet connection issues, I cannot actively participate in distance education. Given a choice, I would prefer face-to-face education." (G 13).

e. Flexibility

Upon analyzing the participants' views, it is observed that the use of information and communication technologies during distance education has increased the flexibility of learning environments. Distance education allows for flexibility in teaching time and location and provides the option to revisit recorded lectures. In addition, the participants felt that distance education positively impacts students' ability to manage work commitments alongside their studies.

"Distance education provides an opportunity for individuals with financial constraints to work while attending classes." (G 3).

"Distance education offers conveniences for both teachers and students, making it more suitable for those with conflicting work schedules." (G 27).

"In terms of time and location flexibility, most people prefer distance education." (G 39).

f. Comparison

The participants compared distance education, which combines teaching and learning elements, with face-to-face education:

"Face-to-face education is superior as it promotes collective participation, with everyone progressing simultaneously. In distance education, differing schedules and other obligations often lead to less coherence, making the learning process more challenging." (G 4).

"Participation in distance education is problematic, but it's manageable for now. However, when compared to face-to-face education, it isn't as good. You can understand in face-to-face education." (G 20).

"If I were to compare the educational gains from the years I received face-to-face education with those from online learning, the latter falls significantly short." (G 34).

g. The Influence of Teaching Staff

Participants highlighted that students' interest, participation, comprehension, learning levels, and motivation in the lessons significantly depend on the instructor's effectiveness. While some participants criticized the instructors for being ineffective in delivering distance education, others appreciated their competence and efficiency.

"Some teachers manage the situation quite well, while others struggle." (G 6).

"As I mentioned earlier, some teachers progress through the course in a monotonous manner, resulting in me gaining little from the lesson." (G 14).

"We have some instructors who read from the slide; most instructors say iii, even while they are reading, and they never rest." (G 34).

4. Conclusion and Discussion

In this section, we discuss and present conclusions derived from the research findings and propose subsequent recommendations. The discussion is bifurcated into two main subsections: research results pertaining to demographic variables and research results synthesizing quantitative and qualitative findings.

The study examines pre-service teachers' perceptions of distance education and their experiences throughout the process. Quantitative data reveal that approximately 75% of pre-service teachers possess a personal computer, whereas 25% do not. Furthermore, around 80% of the participants have an internet connection, while 20% lack such connectivity. These figures suggest that ownership of a personal computer and a reliable internet connection are pivotal tools influencing the efficacy of distance education.

Quantitative analyses illustrate no perceptual differences regarding distance education among pre-service teachers based on gender, personal computer ownership, or field of study. However, perceptions concerning the availability of internet connectivity appear to shift at the total score level. Comparable findings are reflected in numerous other studies examining pre-service teachers' perspectives (Ateş & Altun, 2008; Başar et al., 2019; Duban & Şen, 2020; Er Türküresin, 2020; Karakuş et al., 2020; Paydar & Doğan, 2020; Yılmaz & Güven, 2015).

The uniformity in perceptions of distance education across genders among pre-service teachers in this study suggests a universal impact, corroborated by other research revealing no gender-based differentiation (Kışla, 2005; Ünalır, Önal & Beydağ, 2006; Ateş & Altun, 2008; Yakın & Tınmaz, 2013). Furthermore, Gündüz's (2013) study, which developed the Distance Education Perception Scale used in our research, revealed no significant differences in perceptions of distance education based on gender, computer ownership, or internet connectivity. This observation aligns with Kırallı and Alcı's (2016) finding that university students' perceptions of distance education do not differ based on gender or internet access. These convergent results may be interpreted as the pandemic, which commenced in their first year of higher education, possibly enhancing the perceptions of both male and female students towards distance education.

Distance education offers students the flexibility to learn at a pace, interest level, and skill level that best suits them (Şen, Atasoy, & Aydın, 2010). Thus, individual student characteristics can be instrumental in shaping the distance education experience.

The study found no variations in perceptions among pre-service teachers according to their field of study. Başar et al.'s (2019) research revealed higher perception scores among pre-service teachers in the Department of Computer Education and Instructional Technologies compared to those in other departments. Studies indicate that students in computer and technology-related fields typically display high technology-oriented attitudes (Fidan, 2016; Korkmaz & Altun, 2013; Şahin, Arslan Namlı & Schreglmann, 2016). It may be inferred that technological proficiency, along with a robust understanding and inclination to use technology, can positively affect perceptions of distance education. Nonetheless, this study includes no departments like the Department of Computer Education and Instructional Technologies that offer information technology training among students studying Health Sciences, Social Sciences, and Science. A positive attitude towards computers and technology among distance education students can significantly enhance their perceptions of distance education.

This study determined no significant differences in pre-service teachers' perceptions of distance education based on computer ownership. Nevertheless, it identified a significant difference relating to internet connectivity. Most pre-service teachers in this study had access to the internet, although some lacked this resource. Yıldız's (2011) research suggested that pre-service teachers' ability to partake in synchronous lessons depending on their internet access facilitates the development of a positive attitude towards distance education. Consequently, the broad internet accessibility among this study's participants may have positively influenced their perceptions of distance education. Additionally, İbicioğlu and Antalyalı's (2005) study discovered that owning and using a computer critically impacted students' success in distance education by positively influencing their perceptions.

When reviewing the participants' views, we observed a generally negative perception of distance education, a finding echoed in various studies (Falowo, 2007; Gündüz, 2013; Uzun, Ünal, & Yamaç, 2013). Falowo (2007) asserted the existence of a general prejudice, reflecting a negative perspective towards distance education.

Issues such as technical disruptions, lack of resources, communication breakdowns, teaching staff's impact, and students' sensory limitations, which often contribute to negative perceptions of distance education, adversely affect students' success and learning (Uzun, Ünal, & Yamaç, 2013). Contrastingly, Keskitalo, Ruokamo, and Väisänen's (2011) study found the majority of pre-service teachers regarded distance education as beneficial and effective.

Understanding the results based on the participants' characteristics is crucial, particularly for fields like distance education that require technological equipment, competence, knowledge, and experience. With robust technological infrastructure, distance education can leverage the benefits of student-instructor interaction inherent in traditional education. Taşpınar (2014) posits that the primary factor transforming perceptions of distance education into positive ones is the quality of education delivered.

The pre-service teachers in this study believe that distance education affords flexibility. Distance education is a systematically planned technology application enabling individuality, flexibility, and independence in separate learning-teaching environments concerning time and space (Uşun, 2006). Information and communication technologies enhance the effective use of resources allocated to education and offer flexibility to learning environments (Göktas, Yıldırım, & Yıldırım, 2008). Distance education allows individuals to learn autonomously, with greater flexibility and adaptability to personal circumstances compared to traditional education (Akyürek, 2020). It is distinguished from face-to-face education by its independence of time and location, individualization opportunities, and student independence (Kaya, 2002). As a method, it becomes crucial for eliminating the spatial presence requirement of the teacher and student and for transcending boundaries with information technology systems (Latchem, 2018). In distance learning processes, students can receive education at lower costs in their homes, which are familiar environments (Deveci, 2019).

In this study, pre-service teachers generally felt that distance education did not meet their expectations in comparison to face-to-face instruction. Other studies have also shown that synchronous distance education applications fail to fulfill participants' expectations (Delaney, Jacob, Iedema, Winters, & Barton, 2004; Kaleli Yılmaz & Güven, 2015). This might suggest that students whose expectations are not met may harbor negative perceptions towards distance education.

Pre-service teachers in this study indicated that distance education affords them more time, but they struggle to utilize this time effectively due to personal factors. Additionally, limitations in internet connectivity, technological infrastructure, and experienced challenges negatively affect their course accessibility, participation, continuity, and success. Distance education, a web-based system, provides individuals with learning environments independent of location, catering to their time, interests, and expectations, and serves those unable to participate in face-to-face education for various reasons (Şen, Atasoy & Aydın, 2010).

Pre-service teachers indicate that technological difficulties experienced during classes, family obligations, and work commitments due to economic circumstances negatively impact their distance education process. Existing literature corroborates that in synchronous distance education applications, factors such as students' lack of resources, full-time employment, family responsibilities, economic situations, and technical issues, including freezing or interruption of visuals and audio during classes, can impede their ability to benefit effectively from the lessons and negatively impact long-term distance education efficacy (Uşun, 2006; Gillies, 2008; Karal, Çebi & Turgut, 2011; Doğan & Tatık, 2015).

Pre-service teachers articulate a decrease in motivation during distance education, expressing struggles with maintaining class continuity and focusing during sessions. Increased student absenteeism and diminished motivation have been observed in distance education (Barış & Çankaya 2016). Pre-service teachers perceive themselves as inexperienced during the initial stages of distance education in the pandemic, yet they consider themselves knowledgeable and adept during earthquake-induced distance education. The absence of adequate information and experience with distance education applications can result in a wavering attitude towards distance education (Ateş and Altun, 2008). Interestingly, the study found that long-term distance education following the pandemic and earthquake positively enhanced pre-service teachers' technological acumen, experience, and digital skills. An improvement in digital skills was identified in pre-service teachers who were compelled to steer their own learning during distance education (Seyhan, 2021). The study also revealed that pre-service teachers anticipate a negative impact on the teaching profession in the future due to

distance education, primarily because they were unable to gain practical experience. Their distance education experiences have resulted in less effective learning compared to face-to-face education (Duman, 2020).

Quantitative analysis of the research reveals that the pre-service teachers' perceptions of distance education do not differ significantly based on gender, personal computer ownership, or field of study. However, a significant correlation was found between their internet connectivity status and their views on distance education. Similar perceptions among pre-service teachers, regardless of gender, could be attributed to the commonality of their experiences. No significant difference was observed in their perceptions based on their fields of study or personal computer ownership. This suggests that pre-service teachers' perceptions of distance education do not vary significantly except for the factor of internet connectivity.

Qualitative analysis indicates that pre-service teachers generally harbor a negative perception of distance education. They cite technological problems during lessons, family responsibilities, and the need to work due to their economic situation as factors negatively influencing the distance education process. These challenges result in decreased motivation, a lack of continuity in classes, and difficulty focusing during sessions. However, despite these negative perceptions, they acknowledge that distance education offers flexibility. The gender of the students, computer ownership, and fields of study did not differentiate their views. These quantitative and qualitative findings mutually corroborate each other. Pre-service teachers express concerns that distance education will negatively impact their future teaching profession, mainly due to the lack of practical experience.

The Higher Education Council's (YÖK) pedagogical formation education, initiated in the 2022-2023 academic year and taking place during the distance education process following the earthquake on February 6, is vital for understanding pre-service teachers' perceptions of distance education and its impact on their professional development. According to the research results, it appears that distance education might yield negative results for applied sciences. Teaching, as a profession, necessitates the synthesis of knowledge with classroom applications, which are experientially lived. It is therefore crucial to address the deficiencies identified by pre-service teachers in the distance education process to meet the profession's requirements effectively.

Limitations: The sample of the research is limited to students participating in the pedagogical formation training program at Ahi Evran University. It would be more useful to conduct similar research with a larger sample of distance education teacher candidates.

5. Recommendations

In the execution of Distance Education, the wishes and suggestions of the instructors, teachers, and students should be taken into account.

While developing Distance Education policies, priority should be given to the thoughts and suggestions of lecturers, teachers, students, and other stakeholders in education.

As a result of this study, Distance Education perceptions and experiences of prospective teachers of higher education students and the factors affecting education were determined. In line with the results obtained from this study, preparatory education about the teaching profession can be given to prospective teacher higher education students.

In line with the experiences in the distance education process, studies and trainings should be organized to determine the losses in education and eliminate the deficiencies of the students.

Higher education students and instructors' perceptions of Distance Education can be strengthened.

In other parts of higher education, research can be conducted with students and instructors studying in different fields in the context of different variables.

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