

Open and Distance Education Perceptions of Pre-Service Teachers: Asynchronous and Synchronous Online Learning

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ABSTRACT

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Asynchronous Learning,
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This research aimed to determine students' perceptions in terms of student barriers, satisfaction and community feeling in asynchronous and synchronous online learning processes. Perceptions of students about asynchronous and synchronous online learning processes were examined by survey method. The research was conducted with 3rd grade students studying at the faculty of education. During the Covid-19 pandemic while students experienced asynchronous online learning for a semester, they participated in the synchronous online learning process for a semester. At the end of each semester, students filled the scales of online student barriers, satisfaction and community feeling. It was revealed that students' perceptions of student barriers in asynchronous and synchronous online learning processes were similar. It was determined that students' satisfaction perceptions and community feeling were significantly higher in the synchronous online learning process. Students' satisfaction perceptions with flexibility, retention of learning, course content and learning at their own pace came to the fore significantly in the synchronous online learning process. Satisfaction perceptions of students were similar in terms of effectiveness, program evaluation, material, evaluation and support services in asynchronous and synchronous online learning processes. The majority of students suggested that asynchronous and synchronous online learning should be conducted together. However, the number of students who preferred the synchronous online learning process has also attracted attention. At the end of the research students' perceptions of asynchronous and synchronous online learning were discussed and suggestions were made for future research.

Öğretmen Adaylarının Açık ve Uzaktan Öğretime Yönelik Algıları: Eş-zamansız ve Eş-zamanlı Çevrimiçi Öğrenme

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Topluluk Hissi.

Bu araştırma eş-zamansız ve eş-zamanlı çevrimiçi öğrenme süreçlerinde öğrenci engelleri, memnuniyet ve topluluk hissi açısından öğrencilerin algılarını belirlemeyi amaçlamıştır. Öğrencilerin eş-zamansız ve eş-zamanlı çevrimiçi öğrenme süreçlerine ilişkin algıları tarama yöntemiyle belirlenerek karşılaştırılmıştır. Araştırma eğitim fakültesinde öğrenim gören 3.sınıf öğrencileriyle yürütülmüştür. Öğrenciler Covid-19 salgını sürecinde bir dönem eş-zamansız çevrimiçi öğrenmeyi deneyimlerken bir dönem eş-zamanlı çevrimiçi öğrenme sürecine katılmıştır. Her dönemin sonunda öğrenciler çevrimiçi öğrenci engelleri, memnuniyet ve topluluk hissi ölçeklerini doldurmuştur. Öğrencilerin eş-zamansız ve eş-zamanlı çevrimiçi öğrenme süreçlerinde öğrenci engelleri algılarının benzer olduğu ortaya çıkmıştır. Eş-zamanlı çevrimiçi öğrenme sürecinde öğrencilerin memnuniyet ve topluluk hissi algılarının anlamlı şekilde daha yüksek olduğu görülmüştür. Öğrencilerin esneklik, öğrenmenin kalıcılığı, ders içerikleri ve kendi hızında öğrenmeye ilişkin memnuniyet algıları eş-zamanlı çevrimiçi öğrenme sürecinde belirgin şekilde öne çıkmıştır. Eş-zamansız ve eş-zamanlı çevrimiçi öğrenme süreçlerinde etkililik, program değerlendirme, materyal, değerlendirme ve destek hizmetleri açısından öğrencilerin memnuniyet algıları benzerdir. Öğrencilerin duyuşsal, eylemsel ve genel topluluk hisleri eş-zamanlı uzaktan öğretim sürecinde daha güçlüdür. Öğrencilerin çoğunluğu eş-zamansız ve eş-zamanlı çevrimiçi öğrenmenin birlikte yürütülmesi gerektiğini önermiştir. Ancak eş-zamanlı çevrimiçi öğrenme sürecini tercih eden öğrencilerin sayısı da dikkat çekmiştir. Araştırmanın sonunda eş-zamansız ve eş-zamanlı çevrimiçi öğrenmeye ilişkin öğrencilerin algıları tartışılmış ve gelecekteki araştırmalar için öneriler getirilmiştir.

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INTRODUCTION

Open and distance education is a teaching process that has been used for a long time and is becoming more widespread when face-to-face teaching is not possible or to support face-to-face teaching. It is preferred by students because it offers flexible learning without time and place limits and alternative education opportunities for those who cannot participate in face-to-face teaching for various reasons. Higher education institutions have opened undergraduate and graduate programs which conducted with open and distance education in line with the widespread use of the internet and developments in WEB technologies. Although the open and distance education process has many advantages, there are problems such as lack of interaction, social isolation, low motivation and participation (Clark, Strudler & Grove, 2015; Watts, 2016). The active use of open and distance education platforms from basic education to higher education during the epidemic period has led to a more open discussion of these problems. On the other hand, with the advances in instructional technologies, opportunities such as accessing open online resources, preparing interactive content and asynchronous and synchronous communicating have emerged (Moallem, 2015; Mougiakou, Papadimitriou & Virvou, 2020). Open and distance education is carried out asynchronously, synchronously or blended according to institutional, instructor or student preferences.

The instructor can communicate with their students via discussion boards, e-mail or social media while sharing the course contents through online platforms in the asynchronous online learning process. In this process, students have wide time to think on the knowledge they have learned while studying with the course contents at a time convenient for them. In synchronous online learning, students can communicate with each other and the instructor in real time, have discussions and express their opinions (Brierton, Wilson, Kistler, Flowers & Jones, 2016). Both types of online learning have advantages and disadvantages. Since the perceptions, motivations, interests and preferences of students regarding asynchronous and synchronous online learning may vary according to their needs, different results emerge and more research is required (Gazan, 2020; Peterson, Beymer & Putnam, 2018; Watts, 2016). Although most of the studies were conducted in the pre-pandemic period, the case and survey studies in which the opinions and perceptions of students and instructors regarding open and distance education were determined in the early stages of the pandemic process. It is predicted that the pandemic process will not end in a short time, and it is thought that open and distance education will continue without slowing down. In addition, even if the pandemic process ends, open and distance education will continue to be used actively along with face-to-face education. As a matter of fact, in Turkey, the Council of higher education has increased the rate of lessons that can be given remotely in formal education to 40%. In this context, it is important to reveal students' perceptions of the process in order to conduct open and distance learning more effectively and efficiently. This study aimed to evaluate the experiences of the pre-service teachers studying in the faculty of education in asynchronous and synchronous online learning processes.

Asynchronous Online Learning

Asynchronous online learning is the most widely used open and distance education method because it provides flexibility in terms of time and space (Perveen, 2016). In the asynchronous online learning process, the instructor shares content such as video and audio files, presentations and lesson notes with their students through platforms such as the learning management system, blogs and WEB sites. Students can learn at their own pace and think deeply while studying with the course contents within the framework of their own planning (Ogbonna, Ibezim & Obi, 2019). Students can communicate with instructors and friends via discussion boards and e-mail, participate in web-based assessment activities, and find the opportunity to learn independently and flexibly (Karaaslan, Kilic,

Guven-Yalcin & Gullu, 2018). The instructor interacts with students at different times and places, can assign homework and ask questions through communication platforms. During this process, the students have enough time to prepare their homework, answer questions and think, while the instructor supports the students by assuming a facilitating role (Hrastinski, 2008). Asynchronous online learning is a student-centered method in which students are expected to construct their own learning process and interact with their peers in this process (Shahabadi & Uplane, 2014). Although asynchronous online learning has become a traditional practice of open and distance learning, synchronous online learning has become widespread with the advances in instructional technologies (Watts, 2016).

Synchronous Online Learning

With the widespread use of synchronous communication tools, environments similar to traditional face-to-face teaching can be created in open and distance education (Giesbers, Rienties, Tempelaar & Gijsselaers, 2014). The instructor can communicate with the students in real time with the help of cameras and microphones using virtual classroom and video conference systems. Students can participate live lessons, ask questions to the instructor, receive instant feedback and feel in a classroom environment at any time during the online learning process (Riwayatiningsih & Sulistyani, 2020). The instructor can present the theoretical and practical knowledge by screen sharing, share the course documents with the students, and the students can participate in the lesson with audio and video (Mougiakou, Papadimitriou & Virvou, 2020). Additional activities such as working with a whiteboard, surveying during the lesson, and instant messaging can be done on synchronous online learning platforms (Dziubata, 2020). Live lessons can be recorded and students can watch again after class. The strengths and limitations of asynchronous and synchronous online learning and developments in WEB technologies encourage researchers to conduct studies comparing both communication methods.

Asynchronous vs. Synchronous Online Learning

Open and distance education can be conducted asynchronously, synchronously and in a blended manner. Students' preferences for open and distance education methods may differ in terms of factors such as learning style, time management, interaction and access to content (Karaaslan et al., 2018). In this direction, studies continue to be carried out on the experiences of students in open and distance education. Angeli and Schwartz (2014) found that undergraduate students have more time to think in the asynchronous communication process, and that there is an opportunity for knowledge exchange and mutual dialogue in synchronous communication. Perveen (2016) compared asynchronous and synchronous language learning and found that asynchronous learning is highly effective, but suggested the use of both types of communication together. Yamagata-Lynch (2014) determined that students can engage in mutual discussions with synchronous communication in the blended open and distance learning process, and revealed that they have the time to think about and prepare for the discussion topics determined through asynchronous communication. Peterson et al. (2018) examined asynchronous and synchronous online discussions in terms of collaboration, belonging, and emotional impact. It has been found that synchronous discussions positively affect students' feelings about belonging and cognitive processes. They also stated that asynchronous cooperative learning might not be effective due to the lack of students' perception of interdependence. Brierton et al. (2016) revealed that undergraduate students can acquire higher-level cognitive skills in asynchronous discussions than synchronous discussions. Dahlstrom-Hakki, Alstad, and Banerjee (2020) evaluated students' statistical concepts in asynchronous and synchronous discussions. While it was observed that students preferred synchronous discussions more, they determined that their conceptual understanding was better in asynchronous discussions. Islam (2019) revealed graduate students in reading methods class that he prefers to run synchronous web conferencing and asynchronous text-based online teaching together. Wang and Wang

(2020) compared pre-service teachers' synchronous and asynchronous online teaching process. While there are positive relationships between synchronous online teaching and students' social presences, no significant relationship has emerged between cognitive learning processes and both distance learning methods. During the pandemic period, studies on determining the experiences and opinions of students in the open and distance education process have gained momentum again. Since the transition to open and distance education rapidly during the pandemic period, it is thought that it is important to get feedback from students in order to correct the deficiencies in this process (Keskin & Özer Kaya, 2020).

When the studies in the early period of the Covid-19 pandemic are examined, it can be said that different results have been achieved in studies where asynchronous and synchronous communication methods are carried out together. In addition to the studies in which the synchronous distance education process is found to be more effective for the students and recommended (Brady & Pradhan, 2020; Duban & Şen, 2020; Karahan, Bozan & Akçay, 2020), there are also studies in which asynchronous distance education is preferred (Saltürk & Güngör, 2020). There are also studies suggesting blended methods in which asynchronous and synchronous distance learning processes can complement each other's limited aspects (Ohyama, 2020; Villanueva et al., 2020). Different studies conducted with teacher candidates during the pandemic period evaluated the processes in which asynchronous and synchronous methods were carried out together (Sepulveda-Escobar & Astrid Morrison, 2020; Türküresin, 2020; Yolcu, 2020). Related studies have found that open and distance education has advantages such as repetition, comfortable studying, flexibility of time and space, as well as disadvantages such as lack of interaction and attention, discipline, practice and internet connection problems.

When the studies regarding the open and distance learning process before the pandemic and during the pandemic period were evaluated, it was revealed that the students' preferences regarding asynchronous and synchronous distance education differ, and both methods have strengths and limitations. It can be said that the studies conducted have evaluated student preferences and thoughts regarding the processes in which asynchronous and synchronous distance education are carried out together in the early period of the pandemic. Since the open and distance education process has been going on for three semesters, it is thought that students have started to gain experience in this process. In this study, unlike previous studies, students evaluated both methods by experiencing the asynchronous and synchronous distance learning process separately. These evaluations include comparing asynchronous and synchronous distance learning methods in terms of student barriers, satisfaction perceptions and community feeling. Student barriers stand out as one of the reasons for the negative situations students encounter in the open and distance education process (Horzum, Kaymak & Güngören, 2017). While the satisfaction perception is seen as an important element in the evaluation of online environments (Alqurashi, 2019), determining the community feeling in relation to students' sense of belonging and taking responsibility can contribute to the creation of interactive online environments (Yıldız, 2020). Considering that the open and distance education process will be carried out together with face-to-face teaching even when the pandemic period ends, it is thought that students' evaluations of two different communication methods can contribute to the design of more effective teaching processes.

The Purpose of Study

This research aimed to determine the perceptions of students who participated in asynchronous distance education for a term and synchronous distance education for one term in terms of learning barriers, satisfaction and community feeling during the Covid-19 pandemic. In this context, the problems of the research are as follows:

1. Is there any difference in terms of the barriers students perceive in asynchronous and synchronous online learning processes?
2. Is there any difference in students' satisfaction perceptions in asynchronous and synchronous online learning processes?
3. Is there any difference in students' community feeling in asynchronous and synchronous online learning processes?

METHOD

Research Design

This research is a panel study in which students' perceptions of asynchronous and synchronous online learning are determined by survey method.

Research Sample/Study Group/Participants

The research population consisted of 3rd grade students studying at a state university, faculty of education located in the Middle Anatolia region (255 students). Purposeful sampling, one of the non-random methods, was used in determining the sample. In order for the students to compare the asynchronous and synchronous online learning processes more clearly, the research sample was selected from the students who actively and regularly use the open and distance education system in the spring and fall semesters. Accordingly, 180 students who participated in the asynchronous online learning process in the spring semester of the 2019-2020 academic year and actively use the learning management system were determined. The scales were sent to the students by e-mail and 81 students gave feedback. When the scales were applied to the same students for the second time at the end of the 2020-2021 academic year fall semester, 49 students gave feedback. Table 1 shows knowledge on students' gender and their departments.

Table 1. *Research sample*

Department	Male	Female
Computer and Instructional Technologies Education	6	4
Mathematics Education	3	5
Music Education	-	3
Preschool Education	2	3
Counseling and Psychological Counseling	4	3
Classroom Education	2	4
Social Studies Education	3	3
Foreign Language Education	3	1
Total	23	26

As shown in Table 1, the research sample consists of students studying in eight different departments.

Research Instruments and Processes

The Scale of student barriers to online learning

The scale developed by Muilenburg and Berge (2005) and adapted into Turkish by Horzum, Kaymak and Güngören (2017) was used for students to evaluate asynchronous and synchronous online learning barrier perceptions. The 5-point Likert-type (1: "It is not an barrier" - 5: "It is a very strong barrier") scale consists of eight factors (manager / tutor topics, social interactions, academic skills, technical skills, student motivation, time and support for work, technical problems, internet access and prices) and forty five items. The students evaluated the barriers they encountered in relation to the factors of the scale. The Cronbach's alpha value of the scale was found to be .922 and it was determined to be reliable.

The distance education satisfaction perceptions questionnaire

A questionnaire developed by Eygü and Karaman (2013) was used to determine students' satisfaction perceptions in the asynchronous and synchronous distance education process. The questionnaire is in a 5-point Likert type (1: "Strongly disagree - 5:" Strongly agree ") consists of eight factors (individual suitability, effectiveness, learning, program evaluation, technology, materials, evaluation) and thirty four items. The Cronbach alpha value of the questionnaire was found to be .930.

The online distance education community feeling scale

The scale developed by Ilgaz and Aşkar (2009) was used to evaluate students' processes of developing community feeling in the asynchronous and synchronous online learning process. While the 7-point Likert-type scale (1: "I don't agree at all" - 7: "I totally agree") consists of two factors (Affective, Actional) and six items, the Cronbach alpha value is .80.

Universities have started distance education since March 2020. Due to the Covid-19 pandemic at the university where this research was conducted, the spring semester of the 2019-2020 academic year was conducted with asynchronous distance education. The instructors uploaded video (1 lesson duration: 20 minutes) and lesson notes (PDF documents, PPT slides) to the learning management system every week. Students learned with videos and lesson notes. Instructors and students communicated via e-mail and instant messaging platforms. The learning management system recorded the online activities of the students (duration of video watching, number of viewing and downloading documents). Students had been given homework to replace midterm and final exams. The instructor followed the students by getting reports from the learning management system. Students evaluated the asynchronous online learning process through scales.

The 2020-2021 academic year fall semester was carried out with synchronous distance education. Accordingly, the instructor conducted live lessons using the virtual classroom system (1 lesson duration: 15 min.). Since the live lessons are recorded by the learning management system, the students were able to watch the lessons again. In addition, instructors uploaded lecture notes to the learning management system every week. Students were able to get instant support while being able to connect to the system visually and audibly during live lessons. They were assessed by online tests or homework. The learning management system has been used in both asynchronous and synchronous distance education processes. The students evaluated the synchronous online learning process with the scales they filled out before. Figure 1 shows the data collection process.

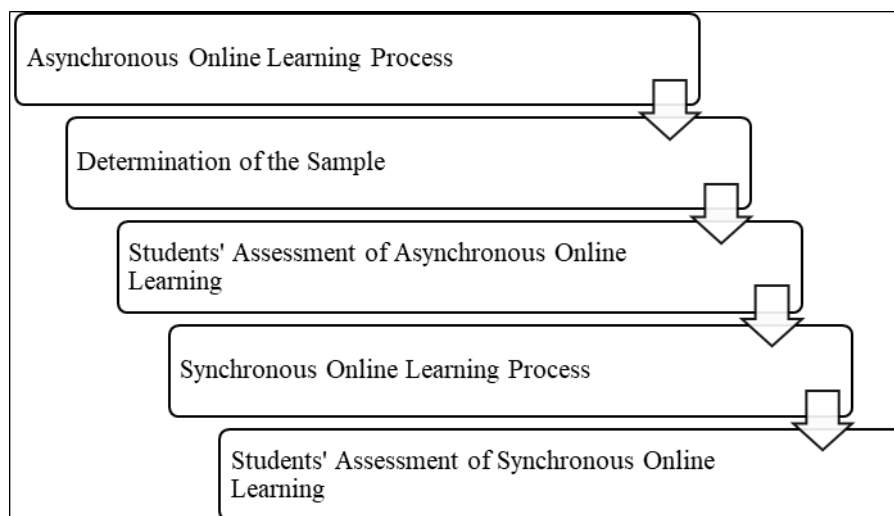


Figure 1. *Data collection process*

As shown in Figure 1, the research was carried out in two stages. In the first stage, the students participated in the asynchronous online learning process. At the end of this process, the students who actively use the learning management system were determined and the scales were sent to their e-mail addresses. In the second stage, students participated in the synchronous online learning process for a semester. In the first stage, students who filled out the scales evaluated the synchronous online learning process. It was determined that the students actively participated in the synchronous online learning process.

Data Analysis

SPSS 22.0 program was used to evaluate the data obtained from the scales. The data were analyzed with the Shapiro-Wilk test and were found to be normally distributed ($p=0.584$). Descriptive statistics (mean, standard deviation, etc.) were used to determine students' perceptions of asynchronous and synchronous online learning processes, and paired t-test was used to compare both learning processes.

Ethic

Ethics committee approvals for this study were gotten on 19.12.2020 with protocol number 2020 / 15-01.

FINDINGS / RESULTS

The students separately evaluated the asynchronous and synchronous online learning process in terms of student barriers. Table 2 shows the descriptive statistical results for student barriers in asynchronous and synchronous online learning process.

Table 2. *Student barriers statistics*

Student Barriers Factors	N	Minimum	Maximum	Mean	Std. Deviation
Manager / tutor topics_1		1	3.63	2.26	.78
Manager / tutor topics_2	49	1	3.36	2.19	.62
Social interactions_1		1	5.00	2.96	1.01

Social interactions_2	1	4.33	3.08	.79
Academic skills_1	1	5.00	2.03	.90
Academic skills_2	1	4.66	2.06	.95
Technical skills_1	1	4.00	1.96	.87
Technical skills_2	1	4.66	1.92	.92
Student motivation_1	1	5.00	2.75	.96
Student motivation_2	1	4.60	2.69	.78
Time and support for work_1	1	5.00	2.26	.87
Time and support for work_2	1	4.60	2.31	.87
Internet access and prices_1	1	5.00	2.55	1.11
Internet access and prices_2	1	5.00	2.75	1.02
Technical problems_1	1	5.00	2.36	1.06
Technical problems_2	1	4.66	2.32	.95
Overall average_1	.97	3.71	2.32	.63
Overall average_2	1.13	3.64	2.30	.57

(1: Asynchronous online learning; 2: Synchronous online learning)

As shown in Table 2, it has been revealed that students' perception of social interaction, student motivation, internet access and price barriers in both asynchronous and synchronous online learning process is higher than other factors. In addition, it was determined that the barrier perception towards academic and technical skills was lower. Students' general perceptions of student barriers to both distance learning methods are between low and medium levels. Table 3 shows the paired t test results.

Table 3. Online student barriers paired t test

Factors	t	Sig. (2-tailed)
Manager / tutor topics_1 - Manager / tutor topics _2	.736	.466
Social interactions_1 - Social interactions_2	-.824	.414
Academic skills_1 - Academic skills_2	-.265	.792
Technical skills_1 - Technical skills_2	.354	.725
Student motivation_1 - Student motivation_2	.469	.641
Time and support for work_1 - Time and support for work_2	.360	.720
Internet access and prices_1- Internet access and prices_2	-1.349	.184
Technical problems_1 - Technical problems_2	.210	.835
Overall average_1 - Overall average_2	.204	.839

(1: Asynchronous online learning; 2: Synchronous online learning)

In the asynchronous and synchronous online learning process, there was no significant difference in terms of the factors and overall average of the student barriers scale. Table 4 presents descriptive statistics on satisfaction perceptions in asynchronous and synchronous online learning.

Table 4. Satisfaction perceptions statistics

Factors	N	Minimum	Maximum	Mean	Std. Deviation
Individual suitability_1		1.22	4.44	2.85	.85
Individual suitability_2		1.88	5	3.46	.69
Effectiveness_1		1.40	5	3.69	.81
Effectiveness_2		2.20	5	3.87	.66
Learning_1		1	4.80	2.86	.99
Learning_2		1	5	3.22	.93
Program evaluation_1		2	5	3.45	.81
Program evaluation_2		2	5	3.64	.65
Technology_1	49	1	5	2.96	1.18
Technology_2		1	5	3.47	.98
Materials_1		2.33	5	4.05	.68
Materials_2		2	5	4.03	.64
Evaluation_1		1	5	3.64	1.01
Evaluation_2		1.60	5	3.49	.90
Support services_1		2	5	3.85	.84
Support services_2		2.50	5	3.88	.71
Overall average_1		1.91	4.55	3.30	.69
Overall average_2		2.11	4.70	3.58	.56

(1: Asynchronous online learning; 2: Synchronous online learning)

As shown in Table 4, satisfaction perceptions with effectiveness, material and support services were higher than other factors in the asynchronous and synchronous online learning process. Satisfaction perceptions with individual suitability and learning were lower in the asynchronous online learning process, while satisfaction perceptions with learning in synchronous online learning process were at a lower level. It has been revealed that students' satisfaction perceptions with asynchronous and synchronous online learning are between medium and high levels. Table 5 shows the paired t test results for satisfaction perceptions.

Table 5. Satisfaction perceptions paired t test

Factors	t	Sig. (2-tailed)
Individual suitability_1 - Individual suitability_2	-5.05	.000
Effectiveness_1 - Effectiveness_2	-1.62	.111
Learning_1 - Learning_2	-2.94	.005
Program evaluation_1 - Program evaluation_2	-1.56	.125
Technology_1 - Technology_2	-3.01	.004
Materials_1 - Materials_2	.11	.912

Evaluation_1 - Evaluation_2	.96	.340
Support services_1 - Support services_2	-.21	.834
Overall average_1 - Overall average_2	-3.01	.004

(1: Asynchronous online learning; 2: Synchronous online learning)

When Table 5 is examined, it is seen that the satisfaction perceptions of the students are significantly higher in the synchronous online learning process. In addition, it was found that the satisfaction perceptions of the students in individual suitability, learning and technology factors were significantly higher in the synchronous online learning process. Table 6 shows descriptive statistics for students' online community feeling.

Table 6. Community feeling statistics

Factors	N	Minimum	Maximum	Mean	Std. Deviation
Affective_1		1	7	4.01	1.40
Affective_2		3	7	5.04	.92
Actional_1	49	1	7	3.60	1.66
Actional_2		1.50	7	4.68	1.22
Overall average_1		1	6.67	3.87	1.40
Overall average_2		2.67	7	4.92	.88

(1: Asynchronous online learning; 2: Synchronous online learning)

It was determined that the affective community feeling of the students were higher than the actional community feeling in both online learning processes. While students' community feeling in the synchronous online learning process was between medium and high levels, they were between low and medium levels in the asynchronous online learning process. Table 7 shows the paired t test results for community feelings in the asynchronous and synchronous online learning process.

Table 7. Community feeling paired t test

Factors	t	Sig. (2-tailed)
Affective_1 - Affective_2	-4,168	,000
Actional_1 - Actional_2	-3,969	,000
Overall average_1 - Overall average_2	-4,404	,000

(1: Asynchronous online learning; 2: Synchronous online learning)

Paired t test results showed that students' community feeling in the synchronous online learning process was significantly higher than asynchronous online learning process. There was also a significant difference in terms of online community feeling factors. After the students completed the asynchronous and synchronous online learning processes, they expressed their preferences regarding how open and distance education should be conducted. Figure 2 shows students' preferences regarding the way the open and distance learning process is conducted.

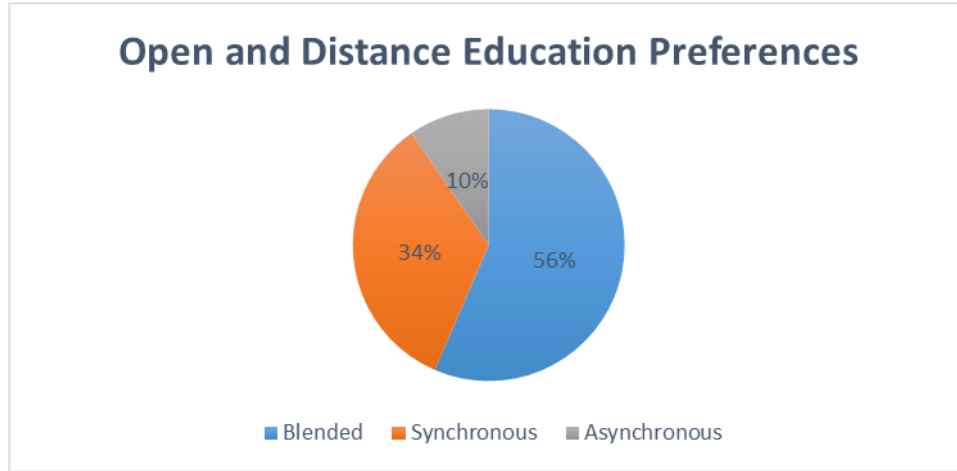


Figure 2. *Student preferences*

The majority of the students suggested that the asynchronous and synchronous distance education process should be carried out together. The number of students who preferred synchronous distance education was also remarkable.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

In this research, students evaluated the asynchronous and synchronous online learning process in terms of student barriers, satisfaction perception and community feeling. It can be said that students' barrier perceptions in two different online learning processes were similar and this perception level was not very high. When the evaluations regarding the sub-factors of student barriers were examined, the barrier perceptions regarding social interaction, student motivation, internet access and prices factors came to the fore. In this context, it can be said that students have some difficulty in peer interaction, working together, motivating themselves and accessing the internet in both asynchronous and synchronous online learning processes. Differentiation of communication methods in open and distance education process did not contribute to students' interaction with their peers and collaborative work. It is thought that there was no difference in this regard, since the problem of accessing the internet is related to the students' own opportunities regardless of the way students' open and distance education process is carried out. Similarly, while it was determined that students' online barrier perceptions was at a moderate level in different studies, communication, taking responsibility and internet infrastructure have drawn attention as prominent barriers (Aljaraidh & Al Bataineh, 2019; Baticulon et al., 2020). On the other hand, the students did not have any problems in terms of using online technologies with their online reading, writing and communication skills in the open and distance education process. Since this research was conducted with the faculty of education students, their taking various technological and pedagogical courses for learning may have contributed positively to their online learning skills. It can be said that the general perception was close to a low level, although there were students who had problems in facing technical problems related to the technologies used in two different online learning processes and getting academic and technical support. During the asynchronous and synchronous online learning process, students received the same support services from both the distance education center support staff and instructors via phone, e-mail and instant messaging platforms. In addition, students did not have too many problems in managing time for learning activities and social life in the open and distance education process.

Students' individual suitability, learning, technology and general satisfaction perceptions were higher in the synchronous online learning process compared to asynchronous online learning. In this context, students' satisfaction perception with flexibility, permanence of learning, content of course and learning at

their own pace came to the fore significantly in the synchronous online learning process. While the students were connected to the system with audio and video during live lessons, they participated in the lesson by sharing their screens. They asked the instructor instant questions and had the opportunity to complete their deficiencies quickly. In the asynchronous online learning process students followed the lesson with previously recorded videos, and mostly asked their questions via e-mail or instant messaging platform. The fact that the synchronous online learning process offers opportunities such as getting fast support and doing practice may have contributed to the higher satisfaction perceptions of the students. In addition, synchronous online learning was more satisfactory in the learning dimension, which was evaluated in terms of its potential to be an alternative to traditional education and the interaction of students with each other and with instructors. It was thought that the virtual classroom systems used in synchronous distance education bring the classroom environment of traditional education to the online environment, contributing to this perception. Satisfaction perceptions of students were similar in terms of effectiveness, program evaluation, material, evaluation and support services in asynchronous and synchronous online learning processes. In these dimensions, the students evaluated their satisfaction perceptions in terms of technical support, the compatibility of the course content with the program, the timeliness of the course contents, access to the learning management system and exams. In asynchronous and synchronous online learning processes, the lecturers shared weekly video lessons, live lessons and lesson documents through the same learning management system. Support services were carried out by the distance education center and instructors. Instructors assessed students with homework in the asynchronous online learning process, while evaluating them with homework and online exams in the synchronous online learning process. The fact that students' satisfaction perceptions were similar in two online learning processes may be related to the similarity of the learning management system, support services used, course documents and program structure. Students satisfied with the materials most used in the asynchronous and synchronous online learning process. While students had satisfaction perceptions lower in the asynchronous online learning process in terms of their flexibility, own pace learning and permanence, the learning dimension was less satisfactory in the synchronous online learning process. Durak and Çankaya (2020), in their study with undergraduate students during the pandemic period, found that students were more satisfied with the distance education process carried out with live lessons compared to the asynchronous distance education.

Students' affective, actional and general community feeling were stronger in the synchronous online learning process. In the affective dimension, there were evaluations in terms of students' trust and value to each other and the opportunities offered by educational programs. In the actional dimension, students made evaluations about sharing their personal and educational problems with their peers. It can be said that students' affective community feelings were more pronounced in the asynchronous and synchronous online learning process. It was noteworthy that the students' sense of trust and caring about their peers was higher than communicating and sharing information in terms of actional. Similar results have been obtained in different studies. Yıldız (2020) found that teaching method, communication, and instructional design in online learning are factors that affect the community feeling. Peterson et al. (2018) revealed that the synchronous online learning process has positive effects on belonging to a community and emotionally on students. The fact that the synchronous online learning process adapts the face-to-face classroom environment to the online environment, provides students with opportunities such as real-time communication with each other and with the instructor, instant messaging, sharing files and content may have contributed to the students' higher community feeling.

The majority of the students had views that the asynchronous and synchronous online learning process should be carried out together. The complementary nature of asynchronous and synchronous online learning processes may have determined the preferences for both communication methods. Similar results were obtained in different studies (Islam, 2019; Ohshima, 2020). On the other hand, the number of students who

prefer synchronous online learning has also attracted attention. As a result, it was determined that there were similar perceptions in terms of student barriers in the asynchronous and synchronous online learning process, while positive perceptions of the synchronous online learning process were higher in terms of satisfaction and community feeling.

In this study, unlike similar studies, pre-service teachers' perceptions were determined after experiencing the asynchronous and synchronous online learning process, respectively, for two semesters. The pre-service teacher made evaluations within the framework of their current pedagogical knowledge. Since the results of open and distance education studies may differ according to the research group, the generalizability of the research results remains limited. In addition, the experiences of students and instructors on open and distance education are increasing. Future studies can be carried out with students studying in different programs alongside pre-service teachers. In this study, quantitative data were collected and evaluated. Studies can be conducted in which qualitative data are collected and evaluated together in addition to quantitative data. Activities that will increase motivation of students, the social interaction with their peers and allow them to work together can be designed in open and distance education courses. Open and distance education process can be planned in which asynchronous and synchronous communication methods are used together.

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