Investigation of Pre-service Teachers' Readiness Levels for Online Learning and Engagement Levels in the Online Environment

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Abstract: The aim of this study was to examine pre-service teachers' readiness levels for online learning and engagement levels in the online environment in terms of various variables and to determine the relationship between readiness levels for online learning and engagement levels in the online environment. The design of the research is the correlational survey model, one of the quantitative research designs. The study group of the research consisted of pre-service teachers who were studying in the faculty of education at a state university in Turkey. In the study, a personal information form, the "Online Learning Readiness Scale" and the "Student Engagement Scale" were used as measurement tools. Within the framework of quantitative data analysis, descriptive statistical techniques, Mann-Whitney U test, Kruskal-Wallis H test and Pearson correlation technique were used. When the research findings were examined, it was seen that the pre-service teachers' readiness for online learning was high in all dimensions; when it comes to engagement in the online environment, it was observed that they obtained high mean scores in the total scale, and the behavioural engagement and cognitive engagement dimensions, while they obtained a moderate mean score in the affective engagement dimension. In addition, it is one of the important results of the study that there was a medium-level, positive and significant relationship between pre-service teachers' readiness levels for online learning and engagement levels in the online environment.

Keywords: online learning, readiness, student engagement, online environment.

Introduction

With the introduction of computers and networks into our lives, developments and changes occur in many areas and make their presence felt in society. According to the Digital 2021 Turkey report, 70% of Turkey's population actively uses social media, 77% uses the internet actively, and mobile connection usage is around 90%. While we use the internet for about eight hours and social media for about three hours on a daily basis, our TV watching time is around three hours (Dijilopedi, 2021). One of the areas where changes are experienced most intensely is the field of education and training. Technological developments have brought many changes in the way we learn, as in many of our habits; teaching and learning has become possible through new technologies and the internet, beyond the classroom environment. In this period, when digital communication opportunities are increasing day by day, it is mentioned that there are new tools that facilitate various learning styles and that can be used in classroom and virtual environments (Ünlü, 2019; Sarıtaş & Barutçu, 2020).

Online learning has become widespread in many educational institutions due to its availability regardless of geographical location, its low cost, and the flexibility it provides to both students and teachers (O'Lawrence, 2005; Oliveira et al., 2018). In recent years, higher education institutions have

been providing access to course materials and course programs over the internet, and the application areas of online learning activities are becoming more widespread day by day. From both a pedagogical and technical perspective, the field of online learning is rapidly changing and evolving. Researchers are expanding the concepts of what knowledge, skills, and attitudes are necessary for the success of online learning (Watkins et al., 2004). One of the variables that are highly effective in the success of online learning activities is students' readiness for online learning (Oliver, 2001). As online learning or internet-based distance learning has become more common recently, many professionals have begun to question whether distance education students are ready to succeed in this environment (Watkins & Corry, 2004).

If individuals are not satisfied with the technology they use and do not feel ready to use it, then they avoid using this technology. For this reason, as new technologies emerge, it is important to measure the readiness level of the people who will use them (Lin & Hsieh, 2007). Since distance education is carried out with technological support, it is important to measure the readiness of the individuals who will receive this education.

Readiness for Online Learning

Readiness for online learning has been defined differently by various researchers. According to Smith (2005), readiness for online learning is "the state of having the motivation for learning, the necessary technological skills, the learning style and the knowledge, skills and beliefs necessary to manage one's own learning in the online environment". According to Warner et al. (1998), readiness for online learning consists of three dimensions: "preferring online learning to face-to-face learning, the individual's self-confidence in using the internet and computer technologies to fulfill his/her learning tasks, and the student's ability to take responsibility for his/her own learning in the online learning environment". According to Oliver (2001), readiness for online learning is a structure consisting of "ability to use technological tools, access to technological tools, technology literacy and self-regulatory learning dimensions". Choucri et al. (2003) described online readiness as "the ability to demonstrate competence in the use of e-resources such as the internet"; on the other hand, Borotis and Poulymenakou (2004) evaluated readiness for online learning in terms of "mental and physical readiness for online learning experience and action". Hung et al. (2010) discussed online learning readiness with the dimensions of self-directed learning, online learning motivation, learner control, computer/internet self-efficacy, and online communication self-efficacy. Because of the use of the scale developed by Hung et al. (2010) in this study, these sub-dimensions were taken into account.

In addition to student readiness in the use of online learning environments, ensuring continuity is a basic requirement in achieving the intended use of these learning environments. It is possible to say that learning begins and continues when students spend enough time in online learning environments, ensure adequate engagement, and interact with the content, teacher or peers (Dağhan & Akkoyunlu, 2016). In some studies conducted in recent years, it has been noticed that it is necessary to focus on the continuity of use behavior rather than the short-term use of various learning environments (Alraimi et al., 2015; Chen et al., 2015). It is considered important to increase the engagement of learners in learning environments in order for them to continue working despite the difficulties they face and to ensure their engagement in the environment (Ergün & Kurnaz, 2017).

Student Engagement

The effort and time students spend in the learning environment is called student engagement. Students with a high level of engagement strive not only to obtain grades, but also to do more with what they learn (Kuh, 2009). According to Fredricks et al. (2004), there are three types of engagement: behavioural, affective, and cognitive. Behavioural engagement refers to various types of behaviour such as engagement in academic or non-academic school activities; it generally includes academic, social and extracurricular involvement. This kind of engagement is important in preventing decreased attendance or withdrawal from the course and in gaining the expected academic outcomes. Affective engagement refers to all emotional reactions of students in the classroom such as interest, happiness, sadness and distress (Stipek, 2002); in other words, it generally includes positive and negative judgments about the school, academics, classmates, and teachers. Affective engagement is estimated to affect the willingness to do a job or establish a bond with an institution. Cognitive engagement includes the student's willingness to put forth the necessary effort to grasp complex ideas and difficult skills; it is considered as a psychological investment in learning (Ergün & Kurnaz, 2017). In this study, engagement in online learning has three dimensions: behavioural, affective, and cognitive. The emotional, behavioural and cognitive aspects of engagement play an important role in the learning process and social development. Student engagement includes attention, focus, belief, interest and emotions that successfully motivate students to practise higher levels of critical thinking skills and foster meaningful learning experiences to achieve course learning goals and progress in their education (Yehya, 2020). Active student engagement is always a challenge for educators, regardless of teaching methods, and this degree of difficulty increases significantly in distance/online learning (Ahshan, 2021).

Today, especially after the corona virus epidemic, online teaching has become a common teaching tool in educational institutions at all levels. However, in order for online learning to achieve its purpose and be effective, it is important to question whether students are ready to be successful in the online learning environment, and their level of engagement.

This study is considered important in terms of determining the level of preparation for online learning, drawing attention to this issue, revealing the current situation and the need for improvement. 21st-century teachers will not assume traditional teacher roles in online or face-to-face education but will rather take on the role of facilitating learning and raising productive generations in education where students are at the centre (Çatana Kuleli, 2018). It is expected that the findings obtained from this research will be useful in drawing the attention of institutions and individuals who prepare and implement teacher training programmes, and authors and bookstores who prepare books for teacher candidates, to the need for online learning readiness. In addition, it is expected that the results of the research will affect the prospective teachers' awareness of the role of the 21st-century teacher and enable them to organise their studies in order to develop these skills in their own education and will shed light on new studies of other researchers in the field.

In the literature, there are studies showing that online learning readiness and student participation are important in creating positive learning outcomes or achieving academic success in online learning environments (Carini et al., 2006; Çakır & Horzum, 2015; Demir & Horzum, 2013; Demiralay et al., 2016; Hung, 2016; Junco, 2012; Junco et al., 2011; Kuh, 2009; Latheef et al., 2021; McKeithan et al., 2021; Vayre & Vonthron, 2018).

Although there are studies examining these two cases (readiness for online learning and engagement in the online environment) separately in the literature, no study has been found that addresses the relationship between them. Based on these explanations, this study aims to determine pre-service teachers' readiness for online learning and their online engagement levels, to examine these dependent variables in terms of different variables, and to determine the relationship between pre-service teachers' online learning readiness levels and online engagement levels.

The internet, which is increasing in prevalence, is used by more than 65% of the world's population (Internet Users, 2021). With the rapid advancement of technology, the areas of access to the internet have also increased. Internet access is available from notebooks, tablets and mobile phones (Durmuş et al., 2018). Internet access and mobile technology ownership are rapidly spreading in Turkey and the world, and the usage time of these technologies is also increasing. In order not to lag behind in the digital age, most countries develop policies for the use and expansion of the internet and mobile technologies, which have a vital role in information production. This is especially true of mobile technology and the use of the internet, which reaches down to very young ages, and also leads to a search for opportunities in the field of education (Güler et al., 2017). Based on this information, the dependent variables of the research were also examined in terms of internet usage time and engagement in online courses. In this regard, the sub-problems of the research are stated below:

1. What is the readiness level of pre-service teachers for online learning?
2. Do pre-service teachers' readiness levels for online learning differ significantly according to their average weekly internet usage time?
3. Do pre-service teachers' readiness levels for online learning differ significantly according to the tools they use to attend online classes?
4. What is the level of engagement of pre-service teachers in the online environment?
5. Do pre-service teachers' online engagement levels differ significantly according to their average weekly internet usage time?
6. Do pre-service teachers' levels of engagement in the online environment differ significantly according to the tools they use to participate in online courses?
7. Is there a significant relationship between pre-service teachers' readiness for online learning and their level of engagement in the online environment?

Methods

Research Design

The design of this research is the correlational survey model, one of the quantitative research designs. Correlational survey models are research models that aim to determine the existence and degree of co-change between two or more variables. In this type of research, three different situations may arise when trying to find out whether the variables change together: there is no significant relationship between the two variables, the variables are proportional in the same direction (positive), or the variables are proportional in the opposite direction (negative) (Karasar, 2009). Since the main purpose of this study is to determine the relationship between pre-service teachers' readiness for online learning and their level of engagement in the online environment, the research design was determined as a correlational survey model.

Sample

The study group of the research consisted of pre-service teachers who were studying in the faculty of education at a state university in Turkey. While creating the sample, reaching pre-service teachers studying in different branches and at different grade levels was tried. The study was carried out in the academic year 2020-2021. The students participating in the study have been studying via distance education since the middle of the 2019-2020 Spring semester due to the COVID-19 pandemic. In the period when the study was conducted, distance courses were conducted through a Learning Management System called ALMS. Therefore, the participants of the research have taken online courses before and are still taking them.

The distribution of the study group according to various demographic characteristics is given in Table 1.

Table 1: Distribution of Pre-Service Teachers According to their Demographic Characteristics

Gender	f	%
Female	169	74.4
Male	58	25.6
Total	227	100
Branch		
Primary school teaching	12	5.3
Middle school mathematics teaching	26	11.5
Pre-school teaching	76	33.5
Guidance and psychological counseling	113	49.8
Total	227	100
Grade level		
1st grade	84	37.0
2nd grade	115	50.7
3rd grade	19	8.4
4th grade	9	4.0
Total	227	100
Average internet usage time per week		
0-7 hours	134	59.0
8-14 hours	55	24.2
15 hours and over	38	16.7
Total	227	100
Online course attendance tool		
Desktop/laptop	149	65.6
Mobile device	78	34.4
Total	227	100

Measurement Tools

In the research, an individual information form was prepared by the researcher in order to collect the demographic information of the pre-service teachers. In the individual information form, the gender of the pre-service teacher (female/male), the branch where he/she was studying (primary school

teaching, middle school mathematics teaching, pre-school teaching, guidance and psychological counseling), the grade he/she was studying (1/2/3/4), the average weekly internet usage time (0-7 hours/8-14 hours/15 hours and over) before starting the online lessons, and the tool used for participating in online lessons (desktop-laptop/mobile device) were included.

In the study, the Online Learning Readiness Scale developed by Hung et al. (2010) and adapted into Turkish by Yurdagül and Alsancak Sırakaya (2013) was used in order to determine the readiness levels of pre-service teachers for online learning. The process of obtaining the Turkish version of the scale was carried out with 13 field and language experts, and the application process was carried out with 724 students from five different universities. Within the scope of the adaptation study, the five-factor relational model was tested as in the original scale, the GFI value was 0.94, CFI was 0.94, NFI was 0.92, and a perfect fit was obtained, where the Turkish scale could measure five interrelated factors as in the original scale. These factors were: computer and internet self-efficacy, self-directed learning, learner control, learner motivation, and online communication self-efficacy. As a result of the factor analysis of the data obtained from the paper-pencil application of the Turkish version of the scale, the correlations of 18 items in five different sub-dimensions gave significant results. As a result of the confirmatory factor analysis, the standardised factor loadings of the five different sub-dimensions of the online readiness structure of the scale items were found to range between 0.60 and 0.90, and they were found to be statistically significant according to the t values in the parametric test. In addition to this, the mean square root of variance explained for all dimensions of the scale was greater than 0.50 and was greater than its correlation with other dimensions. The construct validity study on the correlations between the sub-dimensions and the mean explained variance values yielded positive results. These results show that the Turkish version of the Learner Readiness Scale for Online Learning is a valid and reliable measurement tool (Yurdugül & Alsancak Sırakaya, 2013).

In the study, the Student Engagement Scale developed by Sun and Rueda (2012), and adapted into Turkish by Ergün and Koçak Usluel (2015), was used in order to determine the level of engagement of pre-service teachers in the online environment. The adaptation study was carried out with 398 students who answered the scale. First and second level confirmatory factor analyses were performed for construct validity studies of the scale, and the internal consistency coefficient was calculated for reliability studies. As a result of the confirmatory factor analysis, it was found that the model related to the 19-item scale consisting of three factors, namely, behavioural, cognitive and affective engagement, showed a good fit. The reliability coefficients of the factors in the scale ranged between .62 and .90. The item-total correlations of the items in the scale were calculated between .265 and .658. The analyses showed that the Turkish version of the scale is a valid and reliable measurement tool.

Data Collection and Analysis

Necessary permissions were obtained before the data related to the research were collected, and the data were collected from volunteer pre-service teachers who were willing to participate in the study. At the beginning of the data collection process, the purpose of the study was explained to the participants, the instructions for filling in the scales were shared with them, and they were asked to answer the scale items sincerely and objectively. In addition, it was stated that the responses to the scales would not be used for any purpose other than the scope of the research. Later, data collection tools were transferred to the virtual environment and an internet access address was given so that pre-service teachers could answer using these tools. All of the pre-service teachers in the study group

filled in the scale items completely. The application of the scales to the pre-service teachers was completed in approximately two weeks. The collected data were transferred to the computer environment in order to prepare them for analysis, and the analyses were carried out. Within the framework of quantitative data analysis, descriptive statistical techniques, the Mann-Whitney U test, the Kruskal-Wallis H test for independent samples and the Pearson correlation technique were used.

The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to determine whether the distributions of the measurements related to the dependent variables were normal for the statistical techniques to be applied in the research. Since the statistical (null) hypothesis in the analysis was established as "the distribution of scores does not differ significantly from the normal distribution", the calculated p value being greater than α=.05 is interpreted as the fact that the scores do not deviate excessively from the normal distribution at this significance level and that that the distribution is suitable for the use of parametric tests (Büyüköztürk, 2007). Accordingly, it was observed that the distribution of the measurements related to the dependent variables did not show a normal distribution in terms of the average weekly internet usage time and the tools for participating in online courses ($\alpha < .05$). Based on this finding, the Mann-Whitney U and Kruskal-Wallis H tests, which are non-parametric tests, were used for the variables mentioned.

Findings

Descriptive statistical techniques were used to determine the readiness levels of pre-service teachers participating in the research for online learning, and the results are presented in Table 2.

Table 2: Pre-Service Teachers' Readiness Levels for Online Learning

Factors	n	x̄	SD	Min	Max
Computer self-efficacy	227	11.55	1.92	3.00	15.00
Self-directed learning	227	19.08	2.56	11.00	25.00
Learner control	227	10.51	1.75	5.00	15.00
Learner motivation	227	15.31	2.07	8.00	20.00
Communication self-efficacy	227	11.03	2.02	5.00	15.00
Total	227	67.47	7.02	40.00	85.00

When Table 2 is examined, the total mean scores of the pre-service teachers participating in the research for readiness for online learning are observed as ($\bar{x}$ = 67.47); the computer self-efficacy mean score is observed as ($\bar{x}$ = 11.55); the self-directed learning mean score is observed as ($\bar{x}$ = 19.08); the learner control mean score is observed as ($\bar{x}$ = 10.51); the learner motivation mean score is observed as ($\bar{x}$ = 15.31); and the communication self-efficacy mean score was observed as ($\bar{x}$ = 11.03). Considering the min-max score range of the relevant scale, it can be said that the participants obtained high mean scores.

The Kruskal-Wallis H test was applied in order to determine whether the online learning readiness levels of the pre-service teachers participating in the research differed significantly according to the average weekly internet usage time before starting the online learning applications, and the results are presented in Table 3.

Table 3: Kruskal-Wallis H Test Results for Pre-Service Teachers' Readiness for Online Learning According to Internet Usage Time

Factor	Period	n	Mean Rank	df	X^2	*p*
Computer self-efficacy	0-7 hours	134	111.34	2	.863	.649
	8-14 hours	55	120.74			
	15 hours and over	38	113.64			
	Total	227				
Self-directed learning	0-7 hours	134	122.27	2	6.997	.030
	8-14 hours	55	109.46			
	15 hours and over	38	91.41			
	Total	227				
Learner control	0-7 hours	134	123.05	2	6.625	.036
	8-14 hours	55	98.53			
	15 hours and over	38	104.49			
	Total	227				
Learner motivation	0-7 hours	134	115.63	2	.429	.807
	8-14 hours	55	114.25			
	15 hours and over	38	107.89			
	Total	227				
Communication self-efficacy	0-7 hours	134	115.20	2	.291	.865
	8-14 hours	55	114.62			
	15 hours and over	38	108.88			
	Total	227				
Total	0-7 hours	134	119.41	2	2.664	.264
	8-14 hours	55	109.93			
	15 hours and over	38	100.80			
	Total	227				

When Table 3 is examined, it is seen that the level of readiness for online learning of the pre-service teachers participating in the research does not differ significantly depending on the average time of weekly internet use; however, there is a significant difference in the sub-dimensions of "self-directed learning" [$X^2 = 6.997$, $p \leq 0.05$] and "learner control" [$X^2 = 6.625$, $p \leq 0.05$]. In both dimensions, the mean scores of the participants whose average weekly internet use was 0-7 hours were higher than those who had 8-14 hours of weekly internet use and 15 hours or more.

The Mann-Whitney U test was applied to determine whether the online learning readiness levels of the pre-service teachers participating in the research differed significantly according to the tools they used while participating in online learning, and the results are presented in Table 4.

Table 4: Mann-Whitney U Test Results for Pre-Service Teachers' Readiness for Online Learning According to the Tools they used while Participating in Online Learning

Factor	Tool	n	Mean Rank	Sum of Ranks	U	p
Computer self-efficacy	Desktop/laptop	149	120.18	17906.50	4890.50	.042
	Mobile device	78	102.20	7971.50		
	Total	227				
Self-directed learning	Desktop/laptop	149	116.50	17359.00	5438.00	.424
	Mobile device	78	109.22	8519.00		
	Total	227				
Learner control	Desktop/laptop	149	110.52	16468.00	5293.00	.262
	Mobile device	78	120.64	9410.00		
	Total	227				
Learner motivation	Desktop/laptop	149	118.46	17651.00	5146.00	.148
	Mobile device	78	105.47	8227.00		
	Total	227				
Communication self-efficacy	Desktop/laptop	149	113.70	16941.50	5766.50	.923
	Mobile device	78	114.57	8936.50		
	Total	227				
Total	Desktop/laptop	149	116.46	17352.00	5445.00	.435
	Mobile device	78	109.31	8526.00		
	Total	227				

When Table 4 is examined, it is seen that the level of readiness for online learning of the pre-service teachers participating in the research does not differ significantly depending on the tools they used while participating in online learning; however, there is a significant difference in the "computer self-efficacy" [U = 4890.50, p ≤ 0.05] sub-dimension. The "computer self-efficacy" mean scores of the participants who attended online courses via desktop/laptop computers are higher than those who attended via mobile devices.

Descriptive statistical techniques were used to determine the level of engagement in the online environment of pre-service teachers participating in the research, and the results are presented in Table 5.

Table 5: Level of Engagement of Pre-Service Teachers in the Online Environment

Factors	n	x̄	SD	Min	Max
Behavioral engagement	227	19.04	2.84	8.00	25.00
Affective engagement	227	17.91	4.33	6.00	29.00
Cognitive engagement	227	31.18	4.18	16.00	40.00
Total	227	68.12	8.89	42.00	89.00

When Table 5 is examined, the total mean scores for online engagement of the pre-service teachers participating in the research are observed as ($\bar{x}$ = 68.12); the behavioural engagement mean score is observed as ($\bar{x}$ = 19.04); the affective engagement mean score is observed as ($\bar{x}$ = 17.91); and the

cognitive engagement mean score is observed as ($\bar{x}$ = 31,18). When the min-max score range of the relevant scale is taken into account, the participants obtained high mean scores in the total scale and the behavioural engagement and cognitive engagement dimensions; in the affective engagement dimension, however, it was seen that they obtained a moderate mean score.

The Kruskal-Wallis H test was applied to determine whether the levels of engagement in the online environments of the pre-service teachers participating in the research differed significantly according to the average weekly internet usage times before starting the online learning applications, and the results are presented in Table 6.

Table 6: Kruskal-Wallis H test Results for Pre-Service Teachers' Online Engagement Levels According to their Internet Usage Time

Factor	Period	n	Mean Rank	df	X^2	p
Behavioral engagement	0-7 hours	134	122.22	2	6.905	.032
	8-14 hours	55	109.53			
	15 hours and over	38	91.49			
	Total	227				
Affective engagement	0-7 hours	134	119.99	2	2.797	.247
	8-14 hours	55	104.00			
	15 hours and over	38	107.36			
	Total	227				
Cognitive engagement	0-7 hours	134	122.85	2	6.389	.041
	8-14 hours	55	104.77			
	15 hours and over	38	96.16			
	Total	227				
Total	0-7 hours	134	123.24	2	6.583	.037
	8-14 hours	55	102.53			
	15 hours and over	38	98.04			
	Total	227				

When Table 6 is examined, it is seen that the levels of online engagement of the pre-service teachers participating in the research differs significantly depending on their average weekly internet usage time [X^2 = 6.583, p ≤ 0.05]; in addition, there was a significant difference in the sub-dimensions of "behavioral engagement" [X^2 = 6,905, p ≤ 0.05] and "cognitive engagement" [X^2 = 6.389, p ≤ 0.05]. Considering the aforementioned sub-dimensions and total scores, it is seen that the participants with 0-7 hours of internet usage obtained the highest mean scores, while the participants whose internet usage time was 15 hours or more obtained the lowest mean scores.

The Mann-Whitney U test was applied to determine whether the online engagement levels of the pre-service teachers participating in the research differed significantly according to the tools they used while participating in online learning, and the results are presented in Table 7.

Table 7: Mann-Whitney U Test Results for Pre-Service Teachers' Online Engagement Levels According to the Tools they used while Participating in Online Learning

Factor	Tool	n	Mean Rank	Sum of Ranks	U	*p*
Behavioral engagement	Desktop/laptop	149	122.76	18291.50	4505.50	.005
	Mobile device	78	97.26	7586.50		
	Total	227				
Affective engagement	Desktop/laptop	149	115.12	17153.00	5644.00	.721
	Mobile device	78	111.86	8725.00		
	Total	227				
Cognitive engagement	Desktop/laptop	149	120.39	17937.50	4859.50	.042
	Mobile device	78	101.80	7940.50		
	Total	227				
Total	Desktop/laptop	149	120.49	17953.00	4844.00	.039
	Mobile device	78	101.60	7925.00		
	Total	227				

When Table 7 is examined, it is seen that the level of engagement in the online environment of the pre-service teachers participating in the research differs significantly depending on the tools they used while participating in online learning [U = 4844.00, p ≤ 0.05]; in addition, there is a significant difference in the sub-dimensions of "behavioral engagement" [U = 4505.50, p ≤ 0.05] and "cognitive engagement" [U = 4859.50, p ≤ 0.05]. When the aforementioned sub-dimensions and total scores are examined, it is seen that the mean scores of the participants who attended online courses via desktop/laptop computers are higher than those who attended via mobile devices.

Pearson correlation technique was applied to determine whether there was a significant relationship between pre-service teachers' readiness for online learning and their level of engagement in the online environment, and the results are presented in Table 8.

Table 8: The Relationship between Pre-Service Teachers' Readiness for Online Learning and their Online Engagement Levels

		Behavioral engagement	Affective engagement	Cognitive engagement	Engagement in the online environment
Computer self-efficacy	Pearson Correlation	.369	.064	.225	.255
	Sig. (2-tailed)	.000	.339	.001	.000
	N	227	227	227	227
Self-directed learning	Pearson Correlation	.491	.213	.583	.535
	Sig. (2-tailed)	.000	.001	.000	.000
	N	227	227	227	227
Learner control	Pearson Correlation	.546	.367	.486	.581
	Sig. (2-tailed)	.000	.000	.000	.000
	N	227	227	227	227
Learning motivation	Pearson Correlation	.454	.343	.477	.536
	Sig. (2-tailed)	.000	.000	.000	.000
	N	227	227	227	227
Communication self-efficacy	Pearson Correlation	.379	.134	.334	.343
	Sig. (2-tailed)	.000	.043	.000	.000
	N	227	227	227	227
Readiness for online learning	Pearson Correlation	.659	.327	.632	.667
	Sig. (2-tailed)	.000	.000	.000	.000
	N	227	227	227	227

When Table 8 is examined, it is seen that there is a moderate, positive and significant relationship between pre-service teachers' readiness for online learning and their online engagement levels ($r = .667$, $p \leq 0.05$). Accordingly, it can be said that as the pre-service teachers' readiness for online learning increased, their level of engagement in the online environment also increased. In addition, it was observed that there was a positive and significant relationship between the dimensions of readiness for online learning and the dimensions of learner engagement in the online environment ($p \leq 0.05$).

Discussion, Conclusion and Suggestions

When the research findings are examined, it is seen that the pre-service teachers' readiness for online learning was high in all dimensions; when it comes to engagement in an online environment, it was observed that they obtained high mean scores in the total scale and behavioural engagement and cognitive engagement dimensions, while they obtained a moderate mean score in the affective engagement dimension. When the relevant literature was examined, it was seen that similar results were obtained in various studies (Chung et al., 2020a; Chung et al., 2020b; Küsel et al., 2020; Priyadarshini & Bhaumik, 2020).

When the research findings are examined, it is seen that the level of readiness for online learning of the pre-service teachers participating in the research does not differ significantly depending on the average weekly internet usage time; however, it is observed that there is a significant difference in the sub-dimensions of "self-directed learning" and "learner control". In both dimensions, the mean scores

of the participants whose average weekly internet usage was 0-7 hours were higher than those with 8-14 hours of average weekly internet use and 15 hours or more. The internet usage time mentioned here is the time that the participants spent on the internet before starting their online courses; it does not refer to education and training. Therefore, it is necessary to look at the internet usage purposes of today's youth as well as the internet usage period. Knowles (1975) describes self-directed learning as individuals taking initiative in understanding their own learning needs, setting goals for themselves, finding the necessary resources for learning, determining appropriate learning strategies, and evaluating their own learning; Garrison (1997) defined it as the ability of students to take individual responsibility in determining learning outcomes, cognitive processes and self-management processes. Learner control, on the other hand, is the dimension of a student's directing his/her own learning experience and process (Shyu & Brown, 1992). In the 21st century, individuals do not use the internet only to perform some transactions that will facilitate their daily work. They use it mostly for entertainment and having a good time, and spend serious time in social media (İnce & Koçak, 2017). Social media constitutes an important part of internet use among young people (Obee, 2012). While the internet is used for the purposes of education, obtaining information and sharing, unintended and long-term use of the internet may occur due to the convenience it provides (Yılmazsoy & Kahraman, 2017). According to the data of the Turkish Statistical Institute (2016), between the years 2013-2016, the internet was mostly used by the 16-74 age group for creating a profile on social media, sending messages or photos, etc. As their use of the internet of this kind increases, they have less time to plan their own learning, set learning goals, manage learning, reflect on all these and spend time on them. For this reason, it is a normal result of the research that the participants who had less internet usage time obtained higher mean scores for"self-directed learning" and "learner control".

According to another finding of the study the participants' online learning readiness levels differed significantly in the "computer self-efficacy" sub-dimension, depending on the tools they used while participating in online learning. The "computer self-efficacy"mean scores of the participants who attended online courses via desktop/laptop computers were higher than those who attended via mobile devices. According to a study conducted by Google Inc. (2013), it was found that in Turkey, 91% of internet usage via smart phone is for entertainment, 84% is for communication, and 68% is for the purpose of obtaining information. The use of social media with voice or video calls over the internet has increased over the years, and the rate of information usage has decreased over the years (Güler et al., 2017). In this case, it can be interpreted that individuals who participate in online learning by using desktop/laptop computers use personal computers for learning more than individuals who participate in online learning using mobile devices, and thus their computer skills are improved more.

When the research findings were examined, it was seen that the levels of online engagement of the pre-service teachers participating in the research differed significantly depending on the average weekly internet usage time, and that there was also a significant difference in the sub-dimensions of "behavioural engagement" and "cognitive engagement". Considering the aforementioned sub-dimensions and total scores, it is seen that the participants with 0-7 hours of internet usage obtain the highest mean scores, while the participants whose internet usage time was 15 hours or more obtain the lowest mean scores. Behavioural engagement includes behaviours such as obeying the rules, solving the problems encountered, making an effort to learn, being able to pay attention to the lesson

and continuing and completing the given tasks on time. Cognitive engagement includes doing research from different sources on subjects related to the course, questioning the information obtained while doing this, controlling the tasks performed, working without worrying about grades, and spending time and effort on learning. As stated before, today's youth use the internet mostly for communication and entertainment purposes. Individuals who spend a long time on the internet for non-teaching purposes will have difficulty finding enough time and energy to participate in behavioural and cognitive terms. The fact that as the duration of internet use of the participants increased, their engagement in the learning environment decreased can be explained by these factors.

According to another finding of the study, the level of engagement of the participants in the online environment differed significantly depending on the tools for participating in online learning; in addition, it was observed that there was a significant difference in the sub-dimensions of "behavioral engagement" and "cognitive engagement". When the aforementioned sub-dimensions and total scores are examined, it is seen that the mean scores of the participants who attended online courses via desktop/laptop computers are higher than those who attended via mobile devices. In the age we live in, it is known that students mostly use their mobile devices to communicate, use social networks, browse the internet and have fun, and that they use computers when it comes to studying and doing homework. For this reason, it is normal for students who participate in online learning via desktop/laptop to have higher levels of engagement than those who participate via mobile devices.

According to the last finding of the study, it was seen that there was a moderate, positive and significant relationship between the readiness level of pre-service teachers for online learning and their level of online engagement. Accordingly, it can be said that as the pre-service teachers' readiness for online learning increased, their level of engagement in the online environment also increased. In addition, it was observed that there was a positive and significant relationship between all dimensions of readiness for online learning and all dimensions of online learner engagement. It is known that readiness to learn creates motivation, enables self-directed learning, and in this way, increases learner engagement and ensures continuity. It can be said that the significant relationship between the two mentioned variables may have arisen from these factors.

Universities had to change their teaching practices and provide the necessary technical infrastructure due to the COVID-19 pandemic. However, having a good technical background does not mean that everyone is ready to use it (Küsel et al., 2020). Evaluating students' readiness for online learning is an issue that many educational institutions and educators need to analyse. Students' readiness for online learning is not only related to technical skills in using computers, mobile devices and the internet, but also to how students perceive online teaching and their learning preferences. When it comes to readiness for online learning, all these variables should be considered together (Smith, 2005).

Student engagement is considered important for learners to continue working despite the difficulties they face and to focus on the subject. Studies show that students have high dropout rates in online learning environments. These rates can reach up to 90% in Massive Open Online Course platforms where students register voluntarily, unlike in compulsory education (Rivard, 2013). For this reason, factors such as the grading of students on these platforms and the effectiveness of their attendance in the course should be considered. Online learner engagement and interpersonal interactions with instructors and fellow students can improve student performance and also reduce student attrition rates (Soffer & Cohen, 2019). Instructors in higher education should maximise student engagement to

develop high-quality learning experiences in online environments (Fallahi, 2019; Weidlich & Bastiaens, 2018). Based on all these reasons, besides ensuring the readiness of students for online learning, it is considered very important to take measures to increase their engagement in their course and learning.

Hergüner et al. (2020) revealed that students' online learning attitudes have a positive effect on their readiness for online learning. Therefore, in order to provide the learner with good online learning, it is an important need to create a positive online learning attitude. Research findings by Aguilera-Hermida (2020) revealed that attitude, motivation, self-efficacy and technology use play an important role in students' cognitive engagement and academic performance. In the study conducted by Erdoğdu and Çakıroğlu (2021), the positive effect of humour elements in online materials on increasing behavioural, cognitive and emotional engagement was observed. In the study conducted by Petillion and McNeil (2020), open communication and flexible teaching and assessment methods are recommended to ensure student engagement. Online learning can provide an active social presence that encourages meaningful interactions with content and peers through active discussions, collaborative learning opportunities, group conferences, problem-based learning, and simulations that require students to apply new learning in real-life settings (Weidlich & Bastiaens, 2018). Effective and meaningful teacher and peer interactions are essential to foster engagement for students (Moore & Shemberger, 2019). It may be possible to foster quality engagement through strong teacher/student interaction and meaningful student/student interaction. In order to increase emotional, social and cognitive engagement, it is necessary to understand the emotional skills and abilities students need, interact with students, enable them to become computer and media literate, which allows them to use online learning without technical difficulties, support students to network and share experiences with other students, and create technological collaborations.

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