ADAPTATION OF STUDENTS' ACCEPTANCE OF ONLINE LEARNING SCALE INTO TURKISH: VALIDITY AND RELIABILITY STUDY

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ABSTRACT

Online learning has been conducted in recent years, especially during crises. There have been some studies to increase its effectiveness. Acceptance of online learning is important and affects learners' comfort and their future use. The purpose of this study was to adopt the acceptance of online learning scale into Turkish culture which was developed to determine students' acceptance of online learning in a developing country Survey model was adapted in this study, and data were collected from 384 participants studying in a public university. Confirmatory Factor Analysis (CFA) was performed to check the validity of the scale and Cronbach's alpha coefficient was calculated to assess the reliability of the adapted scale. Five-factor structure of the scale was confirmed, and multiple goodness-of-fit indices, X^2/sd, CFI, RMSEA, SRMR, GFI, and TLI/NNFI were in the range of acceptance levels in the literature. The calculated Cronbach's Alpha values ranged between .81 and .94 in the total and sub-factors, which were above the recommended value in the literature. The adapted scale could be used by researchers and educators to detect the acceptance of online learning at different intervals.

Keywords: Acceptance of online learning scale, adaptation, validity, reliability.

INTRODUCTION

Distance education is a concept with a long history and continues its development with evolving technology from past to present, although it has become well-known in society recently. In this developmental process, different terms such as online learning, remote learning, and mobile learning were coined under the umbrella of distance education. It is possible to state that online learning encompasses all of these concepts (Battal vd., 2023; Zhang et al., 2022).

Online learning is based on the use of internet technology to access educational content and to facilitate learner, teacher, and content interaction (Singh & Thurman, 2019). Internet technology enables education to continue in both synchronous and asynchronous modes (Morrison, 2003). With the development of internet technology and its widespread use, the quality of online education has increased (Celen, Celik, & Sadi, 2011). This issue draws the attention of higher education institutions, and they have been investing in online learning platforms for various reasons. Howell, Williams, and Lindsay (2003) have listed some of them as a) increasing demand for higher education, b) changing profiles of students and their search for suitable classes c) shifting interest from course completion to competence d) increasing importance of lifelong learning, e) increasing internet infrastructure and its contribution to distance education platforms,

f) changing traditional campus life. With its increasing role, online learning takes place mostly in open and distance education programs, and face-to-face education programs integrate their traditional courses with online learning as a supportive element under the concept of blended or flipped learning (Sonmez, 2023).

Distance education, in its well-known form, online education has been conducted in line with face-to-face education. However, in times of crisis when face-to-face education cannot continue, it was replaced with online education. This shift became particularly evident during the recent COVID-19 pandemic. Throughout the pandemic, traditional education was temporarily suspended and replaced with online education at all levels of education from kindergarten to higher education worldwide (Bozkurt & Sharma, 2020). Unfortunately, another crisis happened in Turkiye, two significant earthquakes hit 10 cities in February 2023, affecting millions of people in those regions (Yamamoto & Altun, 2023). In response to this situation, the Council of Higher Education recommended that institutions conduct their educational activities online and most higher education programs have been continuing their education through online education for the spring semester of 2023 (COHE, 2023a). Today, it is possible to argue that almost all learners in higher education have experienced online education for a period in their lives.

Online learning made it possible to access programs flexibly and affordably (Zhang et al., 2022). It provides learners and educators meet independent of time and space. Besides, in online learning environments, different sources of information can be used, and it provide dynamic interfaces to the learners (Korkmaz & Kaya, 2012). Numerous studies have highlighted the advantages of online learning, including flexibility in scheduling, accessibility to a broader audience, cost-effectiveness, and the ability to accommodate various learning styles (Panigrahi, Srivastava, & Sharma, 2018). Additionally, online learning is often praised for its potential to promote lifelong learning and personalized education (Salloum, Al-Emran, Shaalan, & Tarhini, 2019).

Research has been conducted to increase the effectiveness of online learning (Zhang et al., 2022), and has revealed some deficiencies behind its widespread adoption such as a lack of technical support and infrastructure, gaps in legal regulations, and insufficient information for decision-makers (Celen, Celik & Sadi, 2011). Since online education is different than face-to-face education, using the same strategies and theories of traditional education is not suitable for online education (Yavuzalp & Ozdemir, 2020), which could be argued behind the failure of online education (Diaz, 2002). The roles of learners and educators are also unique in online education. To succeed in online learning environments, learners should have self-regulation, self-motivation, technical capabilities, motivation to learn, enhanced online discourse skills, collaborative and time management skills, and they should be persistent towards targeted goals (Berigel & Cetin, 2019). On the other hand, learners' acceptance of online learning is another important issue that affects the adaptation to online learning and their future use. Acceptance of online learning is mostly related to students' comfort in the online learning environment (Rajeb, Wang, Man, & Morett, 2023) and it is an important issue for the effectiveness of online learning (Tarhini, Hone, Liu, & Tarhini, 2017)

Research has shown there were many factors affecting students' acceptance of online learning (Panigrahi et al., 2018). In the literature, some of the factors stated as perceived ease of use and usefulness (Mahmodi,2017), usefulness and attitude (Farahat, 2012), quality and trust (Salloum, 2019), satisfaction (Ilgaz & Gulbahar, 2015), future intention to use (Beldad & Hegner, 2018). Besides, these factors were grouped in the literature. Panigrahi et al., (2018) listed them into two groups as environmental and personal factors. Similar to Panigrahi et al., (2018), Rajeb et al., (2023) grouped them as institutional and student-related factors based on the extensive review of the related scales. They listed institutional factors as support system, instructional quality, instructor efficiency, technical assistance, technological sufficiency, and student-related factors as resistance to change and digital literacy.

In the literature, there were some scales measuring the acceptance of students from only one dimension based on the aforementioned factors. Some of them prioritized the student-related factors (i.e. Tarhini et al., 2016), while some of them focused on the institutional factors only (i.e. Alenezi et al., 2011, Tee, 2010). However, both dimensions were dependent on each other and affected them (Rajeb et al., 2023). At this point, there was a need to assess students' acceptance from both dimensions. On the other hand, the previous scales were developed mostly in developed nations by considering the situation in those countries. However, the situation was different in developing countries such as the condition of infrastructural issues. Therefore, students' needs in developing countries might change, which would affect the acceptance of online learning. Although some

scales exist in Turkish such as the Online Learning Readiness Scale (Ilhan & Cetin, 2013) no such scale was met focusing on both dimensions, institutional and student-related factors to our knowledge. Turkiye, with its increasing young population and higher education learners, applies online learning in distance education programs and in some circumstances such as crisis times. The adapted scale will help to reveal the factors that influence students' acceptance of online learning and inform stakeholders about online learning.

Online learning and teaching entirely depend on technology and internet use, thus, learners and educators need to access technology and use it efficiently (Adedoyin & Soykan, 2023). Digital competencies and technological capabilities are important factors in the acceptance of online learning (Hamad, 2022). The suitable technology access of learners differs across the countries (Aguilera-Hermida et al., 2021), and even within the countries (Soomro, Kale, Curtis, Akcaoglu, & Bernstein, 2018). According to Rajeb et al., (2023), the technology-related issues were worse in developing countries in terms of internet speed, students' digital skills, intuitions' technological affordances, and instructors' ability to conduct online education.

PURPOSE OF THE STUDY

Rajeb et al. (2023) developed a scale determining students' acceptance of online learning in a developing country and they conducted the validity and reliability of the scale. They proposed a scale to measure the effectiveness of online learning in a developing country. Turkiye is a developing country that has 204 universities and millions of learners in higher education according to a report of the Council of Higher Education (CoHE, 2022). During the pandemic and two earthquakes, online education was conducted for a period. At this point, a valid and reliable measurement tool is needed in Turkiye to determine students' acceptance of online learning in higher education. In this direction, adapting the scale developed by Rajeb et al. (2023) to Turkish culture and determining its validity and reliability will contribute to researchers studying online learning.

The purpose of this study was to adopt the acceptance of the online learning scale developed by Rajeb et al. (2023) in Turkish culture. For this purpose, the following research questions guided the current study.

1) Is the Acceptance of Online Learning Scale a valid measurement tool in Turkish culture?
2) Is the Acceptance of Online Learning Scale a reliable measurement tool in Turkish culture?

METHOD

In this study, a quantitative methodology was employed to evaluate the reliability and validity of the Turkish version of the Acceptance of Online Learning Scale (AOLS), which was originally developed by Rajeb et al. (2023). The study utilized a survey model, and quantitative techniques were employed to analyze the collected data.

Participants

The sample size required was calculated based on the 95% confidence interval calculation (Gurbuz & Sahin, 2014). The population of the current study consisted of 27981 undergraduate students studying at a public university in Turkiye (CoHE, 2023b). According to the 95% confidence interval, the lower limit for the sample size of the study is 379, and the research sample consisted of 384 undergraduate students studying at a public university in the 2022-2023 academic year. Thus, the sample size of this study is deemed sufficient according to the 95% confidence interval. Simple random sampling was used to select the participants of the current study.

Of the participants, 311 (81%) were female, and 73 (19%) were male. The age distribution of the participants changed from 19 to 25. Out of the total participants, 81 were aged 19 and under (21.4%), 160 were aged between 20-22 (41.7%), and 142 were aged 23 and over (37%). The majority of the participants were in the first grade (f=149, 38.8%). The number of second graders was 46 (12%), third graders were 67 (17.4%), and there were 122 in the 4th grade and above (31.8%). As seen from Table 1, the majority of the participants are female, between the ages of 20-22, and university students studying in their first year. This may be due to the selection of participants through simple random sampling. It may also reflect the average characteristics of students studying at the relevant state university.

Table 1. Descriptive Statistics on Demographic Variables

Variables		N	%
Gender	Female	311	81
	Male	73	19
Age	19 and under	81	21.4
	20-22	160	41.7
	23 years and older	94	37
Grade	First	149	38.8
	Second	46	12
	Third	67	17.4
	Fourth	122	31.8
Total		384	100

Data Collection Tool

In this study, the Turkish version of AOLS developed by Rajeb et al. (2023) was used to collect data. AOLS is a seven-point Likert-type data collection tool with five factors and 20 items. The scale's factors include technological sufficiency (four items), instructors' efficiency (five items), digital literacy (three items), technical assistance (three items), resistance to change (two items), and students' acceptance (five items). During the adaptation of AOLS into Turkish, data was collected from a sample of 441 university students.

The Cronbach alpha coefficient of the original AOLS is .83 in the dimension of technological competence of the students, .84 in the dimension of the effectiveness/competence of the instructors in conducting online education, .82 in the dimension of digital literacy of students, .87 in the dimension of technical support for online activities and .94 in the dimension of general acceptance for online learning activities. The item load values of the items in the AOLS (20 items) varied between .65 and .88. Confirmatory factor analysis was performed to test the validity of the AOLS. As a result of confirmatory factor analysis, the five-factor structure of AOLS was confirmed (X^2/sd= 2.77, RMSEA= .06, NFI= .93, and CFI= .95).

Language Equivalence Study

The Turkish Draft Form of AOLS (AOLS-TDF) was used to collect data in the study. Firstly, permission was obtained from the developers of the AOLS, Rajeb et al. (2023). After obtaining permission, the language equivalence process of AOLS was initiated. For this purpose, three English and two Turkish language experts contributed to the language equivalence of the adapted scale. Firstly, the items in the AOLS were translated into Turkish by the first English language expert. The translated TDF was translated back into English by a second English language expert. Then, the original and re-translated English scale forms were checked by the third English language expert to see if the scale had any loss of meaning. At the end of this process, it was concluded that there was no loss of meaning in the scale.

The final TDF of the scale was checked by two Turkish language experts in terms of any expression disorder and intelligibility. Some corrections were made on the items in a way that the original meanings were preserved, depending on the feedback given. Lastly, the scale was applied to a limited number of students as a pilot study. Based on the opinions of 15 students, some corrections were made to the items, preserving the original meanings according to their feedback. At the end of the process, the final version of the Turkish AOLS scale was completed by the researchers. In addition, just before the final version, it was re-examined by English language experts. As a result of the studies carried out within the scope of language equivalence, the pilot implementation phase of AOLS-TDF was initiated.

Procedures and Data Analysis

Before the data collection process, Ethics Committee Approval from the Scientific Ethics Evaluation Committee of a public university dated 04.07.2023 and numbered E-16343714-605.02-544158) was received to carry out this study. The data were collected via Google Forms in the 2022-2023 academic year. It took an average of 15 minutes to complete the scale.

The data were coded into Google Sheets and in the coded data, primarily erroneous entries were checked and errors were corrected manually. Then, missing data analysis was applied and the approximate value assignment method was used. For the validity and reliability analysis of the sample size, the literature on the adequacy of the sample size was reviewed (Tabachnick & Fidel, 2012). In line with the recommended sample size in the aforementioned literature, it was decided that the sample consisting of 384 participants was suitable for validity and reliability analysis.

Within the scope of the analysis of the data, first of all, the normality assumption was checked. In this context, standard deviation, skewness, kurtosis coefficients and mean, median, and mode values were examined. The calculated standard deviation, skewness, and kurtosis values, respectively, were 1.13, -.22, .36 in AOLS; 1.48, -.38, -.43 in the factor of technological sufficiency; 1.27, -.30, -.02 in the factor of instructors' efficiency; 1.36, -.37, -.10 in the factor of digital literacy; 1.54, -.30, -.47 in the factor of technical assistance. They were in the factor of the general acceptance of online learning activities were 1.76, .22, -.99, respectively. Skewness and kurtosis values were between ±2. In addition, mean, median and mode values calculated respectively were 4.17, 4.20, 4.35 in AOLS; 4.43, 4.62, 4.75 in the factor of technological sufficiency; 4.29, 4.40, 4.00 in the factor of instructors' efficiency; 4.65, 5.00, 5.00 in the factor of digital literacy; 4.31, 4.33, 4.00 in the factor of technical assistance; 3.47, 3.40, 3.00 in the factor of the general acceptance for online learning activities. The results showed that the data was normally distributed. After meeting the necessary assumptions, confirmatory factor analysis was performed using the AMOS 22 package program for validity analysis, and Cronbach alpha internal consistency coefficient and item-total correlation techniques were employed for reliability analysis.

FINDINGS

Findings Regarding the Validity of the AOLS

The tool consisting of 20 items aims to measure the acceptance level of online learning and was developed based on five theoretical factors. These factors were students' technological sufficiency, instructors' efficiency in conducting online education, students' digital literacy, technical assistance for online activities, resistance to change, and general acceptance for online learning activities. The scale was prepared in a seven-point Likert type. The rating range of AOLS is as follows; strongly disagree (1.00-1.84), disagree (1.85-2.70), strongly disagree (2.71-.3.56), neither agree nor disagree (3.57-4.42), somewhat agree (4.43-5.28), agree (5.29-6.14), strongly agree (6.15-7.00). Confirmatory factor analysis was performed to verify the factor design of the instrument within the framework of the validity analysis of the AOLS.

As a result of the confirmatory factor analysis, the t values of the latent variables explaining the observed variables were found to be statistically significant at the .01 level. In the context of parameter estimations, it is statistically significant at the level of .05 if the t values exceed 1.96 and at the level of .01 if it exceeds 2.56 (Cokluk et al., 2014). In addition, it was determined that the error variances of the observed variables were normal (Cokluk et al., 2014). Since there were significant t values for all items in the model, all indicators were included in the model. The path diagram obtained from the confirmatory factor analysis is presented in Figure 1. The results of the confirmatory factor analysis of the AOLS are presented in Table 2.

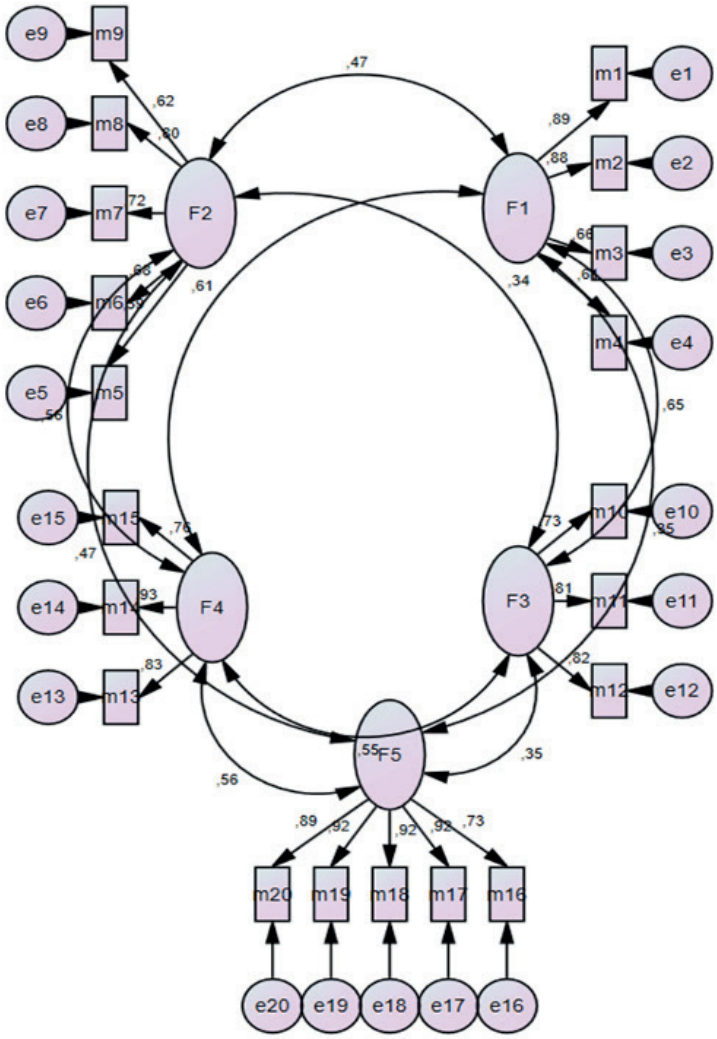

Figure 1. Path Diagram of the Acceptance of Online Learning Scale

According to Table 2, the p value is significant at the .01 level. In many confirmatory factor analyses, it is normal for the p value to be significant due to the large sample size (Cokluk et al., 2014). For this reason, alternative fit indices regarding the fit between the two matrices were evaluated. As a result of the analysis, X^2/sd and CFI values were excellent; it can be stated that the RMSEA, SRMR, GFI, and TLI/NNFI values have good compatibility (Cokluk et al., 2014). According to the analysis values, the five-factor structure [technological sufficiency of the students (four items), instructors' efficiency in conducting online education (five items), digital literacy of the students (three items), technical support for online activities (three items), and general acceptance for online learning activities (five items)] of the AOLS consisting of 20 items was confirmed.

Table 2. The results of the Confirmatory Factor Analysis of the Acceptance of Online Learning Scale

Compliance measurements	Measurement value	Reference range
P	.00	< .01
X^2/sd	2.79	≤ 3
RMSEA	.06	≤ .08
SRMR	.06	≤ .08
GFI	.91	≥ .90
TLI/NNFI	.94	≥ .90
CFI	.95	≥ .95

Findings Regarding the Reliability of the AOLS

Reliability analyses were conducted by examining item analysis using item-total correlations and Cronbach's alpha to assess the reliability of the scale. The reliability analysis results of AOLS are presented in Table 3.

Table 3. The results of the Confirmatory Factor Analysis of the Acceptance of Online Learning Scale

Dimensions	Alpha value	Item-total correlation
Technological sufficiency of students	.85	.62-.73
Instructors' efficiency in conducting online education	.81	.51-.79
Digital literacy of students	.83	.61-.73
Technical assistance for online activities	.87	.69-.84
General acceptance for online learning activities	.94	.70-.89
Acceptance of online learning scale	.92	.40-.74

According to Table 3, the internal consistency coefficient (Cronbach's alpha) values are .92 in the AOLS, .85 in the factor of technological sufficiency of students, .81 in the factor of instructors' efficiency in conducting online education, .83 in the factor of digital literacy of students, .87 in the factor of technical assistance for online activities, .94 in the factor of the general acceptance for online learning activities. In this context, it can be stated that the internal consistency coefficient (.70 and above) in the total and factors of the AOLS is sufficient for reliability (Buyukozturk, 2013).

The item-total correlations were between .40-.74 in the AOLS, .62-.73 in the factor of technological sufficiency of students, .51-.79 in the factor of instructors' efficiency, .61-.73 in the factor of digital literacy, .69-.84 in the factor of technical assistance for online activities and, between .70-.89 in the factor of the general acceptance for online learning activities. In this context, considering the item-total correlations (.30 and above) in the general dimensions of AOLS, it can be interpreted that the items in the scale distinguish individuals well (Buyukozturk, 2013).

DISCUSSIONS AND CONCLUSION

Online learning has been conducted for over two decades, but it was widely implemented especially in crisis times such as the global outbreak. In Turkiye, online learning has been applied in higher education during two crisis times; recent earthquakes that happened in a vast geographical area and the pandemic. With its increasing popularity recently, the acceptance of online learning has become an important issue for the effectiveness of online education (Tarhini et al., 2017). Rajeb et al. (2023) developed a scale to measure the acceptance of online learning in Bangladesh and confirmed its validity and reliability. There was also a need for a valid and reliable scale to assess students' acceptance of online learning in Turkiye. The purpose of the current study was to adopt the scale into Turkish culture and confirm its validity and reliability. For this purpose, firstly, necessary permission from the developers of the scale was granted and ethical approval from a public university was obtained before the data collection process. Then, the items in the scale were translated into Turkish by the language experts. In this process, an English language expert translated the items into Turkish, and another expert back-translated them into English to identify any differences from the original items. Turkish language experts checked the items and recommended some revisions regarding meaning and grammatical issues. After establishing language equivalence for the items, the draft form was tested by a group of target students to assess the comprehensibility of the items. The final version of the scale was refined according to the results of the pilot study.

Survey model, a quantitative methodology was followed in this study. The main phase of the study was conducted with 384 participants studying in a public university in Turkiye. The data was collected via an online survey. After the necessary assumptions were met, Confirmatory Factor Analysis (CFA) was performed to check the validity of the scale, and Cronbach's alpha coefficient was calculated to assess the reliability of the scale. According to the CFA analysis, the five-factor structure of the scale was confirmed. Multiple goodness-of-fit tests were evaluated, and X2/sd, CFI, RMSEA, SRMR, GFI, and TLI/NNFI values were in the range of

acceptance levels in the literature (Cokluk et al., 2014). The calculated Cronbach's Alpha values ranged between .81 and .94 in the total and sub-factors, which were above the recommended value (Buyukozturk, 2013).

To sum up, validity and reliability analyses were conducted within the framework of adapting AOLS into Turkish culture, originally developed by Rajeb et al. (2023). The Turkish form of the scale consisted of 20 items and five factors, identical to the original scale. This supports the argumentation of Rajeb et al. (2023), where they asserted that the scale could apply to a similar context. Additionally, it could be inferred that the theoretical foundation of the scale was strong, and culturally appropriate words and expressions were used in the scale (Yavuzalp & Ozdemir, 2020). It was concluded that the Turkish form of AOLS is a valid and reliable data collection tool.

The rise of online learning continues, and the number of programs offering online education in higher education is increasing (Singh & Thurman, 2019). This is especially evident with Massive Open Online Courses (MOOCs), making many online courses available to anyone at little or no cost (Cagiltay, Toker, & Cagiltay, 2023). Administrators and lecturers could assess the acceptance of online learning with this scale adapted into Turkish at different intervals. Thus, they could enhance the effectiveness of online learning, which could reveal the potential importance of online education. Educators and researchers should take precautions based on the results of the total and sub-factors of the scale.

This adaptation study had some limitations that future research should focus on. The data of the current study were obtained from undergraduate students of only a public university. The facilities of the universities vary. They all have different technical capabilities (i.e. computer laboratories, high-speed bandwidth internet, learning management systems) and institutional settings (i.e. offering lecturers in-service training regarding the pedagogy of online learning). They might offer different settings to their students, and private universities may implement online learning to learners in a well-established way. Therefore, data would be collected from more students studying at different universities, especially in private universities due to the various types of applications of online learning in those universities. The validity and reliability of AOLS can be tested in various contexts through larger and different sample groups, different university types, and education levels. Different perspectives can contribute to the literature on students' acceptance of online learning.

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APPENDIX

Acceptance Of Online Learning Scale

	Ogrencilerin teknolojik yeterliligi
1	Cevrimici ogrenmede kullanabilmek icin yeterli donanim mevcuttur.
2	Cevrimici ogrenmede kullanabilmek icin yeterli yazilim mevcuttur.
3	Bolgenizde internet erisimi kabul edilebilir olcude hizli ve sureklidir.
4	Uzaktan egitimde cevrimici ogrenme icerigini indirmek kolaydir.
	Ogretim elemanlarinin online egitim yurutmedeki etkililigi/yeterliligi
5	Ogretim elemanlari, cevrimici derslere ilgi uyandirabilir.
6	Ogretim elemanlari web teknolojisini kullanmada etkilidir.
7	Genellikle cevrimici derslerde soru sormaya tesvik ediliriz.
8	Ogretim elemanlari, ogrenci etkilesimini tesvik eder.
9	Ogretim elemanlari, her bir ogrenciye arkadasca yaklasir.
	Ogrencilerin dijital okuryazarligi
10	Cevrimici derslerde basarili olmak icin gerekli becerilere sahibim.
11	Cevrimici ogrenme surecinde belirli isler icin gerekli yazilim uygulamalari hakkinda detayli bilgiye sahibim.
12	Bilgisayar kullanma konusunda yeterliyim.
	Online etkinlikler icin teknik destek
13	Universitemiz tarafindan saglanan cevrimici olanaklara yeterli ve ihtiyacimiza uygun duzeyde erisimimiz bulunmaktadir.
14	Universitemiz ogrenciler icin uygun Bilgi Teknolojileri destegi saglamaktadir.
15	Universitemizde cevrimici egitimi desteklemeye yonelik olusturulmus bir Bilgi Teknolojileri birimi bulunmaktadir.
	Online ogrenme etkinliklerine yonelik genel kabul
16	Cevrimici ogretim ve ogrenim faaliyetlerinden memnunum.
17	Gelecekte, cevrimici derslere kaydolmak isterim.
18	Arkadaslarima cevrimici derslere kaydolmalarini tavsiye edecegim.
19	Cevrimici dersler benim icin uygundur.
20	Cevrimici ogrenme konusunda istekliyim.

- *Derecelendirme Araligi:* Yedili Likert tipi - 1. Kesinlikle Katilmiyorum (1.00-1.84), 2. Katilmiyorum (1.85-2.70), 3. Pek Katilmiyorum (2.71-.3.56), 4. Ne Katiliyorum Ne Katilmiyorum (3.57-4.42), 5. Biraz Katiliyorum (4.43-5.28), 6. Katiliyorum (5.29-6.14), 7. Kesinlikle Katiliyorum (6.15-7.00)
- *Cevrimici ogrenmeyi kabul olcegi (COKO), izin alinmadan ve atifta bulunularak kullanilabilir.*