

## THE ONLINE LEARNING SELF-EFFICACY SCALE: ITS ADAPTATION INTO TURKISH AND INTERPRETATION ACCORDING TO VARIOUS VARIABLES

**Dr. Nuh YAVUZALP**

ORCID: 0000-0001-9275-275X  
Faculty of Education  
Bolu Abant Izzet Baysal University  
Bolu, TURKEY

**Dr. Eralp BAHÇIVAN**

ORCID: 0000-0001-5621-3302  
Faculty of Education  
Bolu Abant Izzet Baysal University  
Bolu, TURKEY

**Received:** 30/12/2018 **Accepted:** 21/05/2019

### ABSTRACT

The aim of this study was to adapt the Online Learning Self-Efficacy Scale (OLSES), developed by Zimmerman and Kulikowich (2016) to determine university students' self-efficacy perceptions in online learning environments, into Turkish, and to analyse the validity and reliability of the results of the scale. The original form of the scale, which is in English, consists of three factors (learning in the online environment, time management and technology use) and of 22 items. In this process, first of all the Turkish language equivalence of the scale was ensured, and then, in the light of the recommendations of experts in the field, the content validity of the scale was established. Next, to ascertain its construct validity, the scale was applied to 2,087 university students who were taking at least one of the campus-based common compulsory courses via distance learning. According to the results of the analysis performed in adherence with the exploratory factor analysis used in the original scale, one item was removed from the scale since it had a factor loading below 0.40, and a single-dimension scale consisting of 21 items was obtained. The factor loadings of the items in the scale were observed to range between 0.85 and 0.92. The Cronbach's alpha coefficient of internal consistency calculated for reliability of the scale was determined as 0.987. Consequently, it is considered that inferences and interpretations to be made based on the Online Learning Self-Efficacy Scale consisting of 21 items and a single dimension will be valid and reliable. In the interpretations made of the research data, the variables of gender and school type were examined. No statistically significant difference was found between groups regarding either gender or type of school.

**Keywords:** Self-efficacy, online learning, scale adaptation, higher education.

### INTRODUCTION

The developments in current technology have led to changes in the way information is distributed and accessed. Internet technologies, which have become one of the most widespread methods of accessing information, have an effect on education systems and teaching-learning activities. In particular, the development of internet technologies has supported the development of distance learning technologies and led to the appearance of mass distance learning platforms. Nowadays, many studies are being conducted to ensure the effectiveness and efficiency of the distance learning method, which meets an important educational need. Important qualities of distance learning are presentation of lesson contents that are enriched with multimedia objects in online learning environments, synchronous and asynchronous use of online communication tools, and time- and space-independent service to students. Moreover, e-learning environments have the quality of enabling various communication technologies that can be used on independent platforms to be used together (Onal and Ibili, 2017).

If individuals who utilise these environments have access to distance learning lesson content and possess the skills of time management and use of the relevant technologies, this will have a positive effect on their academic success (Taipjutorus, Hansen, & Brown). Beliefs regarding the ability to carry out these skills can only be revealed or explained with psychological variables. Alivernini and Lucidi (2011) state that self-efficacy is a good predictor of academic success and that it also assists students in adapting well to new learning environments. Indeed, self-efficacy is stated to be one of the most important psychological variables that can alter students' perceptions regarding their study environments (Pajares, 1996). Therefore, it can be considered that self-efficacy will also have an effect on students' success in online learning environments.

## SELF-EFFICACY

One of the most important factors in social cognitive theory, self-efficacy is defined by Bandura as a quality that affects an individual's judgement of him/herself and how his/her behaviour emerges, with regard to his/her capacity to organise the necessary activities to carry out a certain performance and to do it successfully (Askar and Umay, 2001). Moreover, Bandura (1977) expresses self-efficacy as an individual's beliefs regarding how well he/she can perform the actions required to deal with potential situations. Based on these definitions, developing individuals' beliefs regarding how well they will carry out the activities they need to perform with regard to a certain aim may also affect their performances. Zimmerman (1995) emphasises that self-efficacy involves an individual's judgements of his/her ability to carry out and succeed in a task. Naturally, self-efficacy is regarded as an important indicator in individuals' execution of stressful tasks that they have never previously performed (Bandura, 1977).

In many higher education institutions in our country, campus-based common compulsory classes are given via distance learning. A large majority of university students have their first experience of distance learning when taking these courses. In this context, it is considered that self-efficacy can be a significant factor in online learning environments, in which many students have their first experiences. Horzum and Cakir (2009) state that high student perceptions related to online technologies can affect students' interaction with their classmates and instructors as well as their technology use behaviour. Furthermore, some researchers claim that self-efficacy can be a key component of academic success in online learning (Hodges, 2008). Shen, Cho, Tsai and Marra (2013) report that apart from online learning success, self-efficacy is also related to students' previous online learning experiences and to their gender. Lim (2001) states that students' computer self-efficacy has a significant effect on their satisfaction and on their opinions regarding participation in future online courses. Besides, Zimmerman and Kulikowich (2016) report that students with a high level of online learning self-efficacy are more likely to be successful in online courses.

Considering the above definitions and opinions of researchers, it can be understood that self-efficacy is an important psychological factor in online learning environments. Considering that self-efficacy, which is reported to have a significant effect especially on students' academic success, affects the success of individuals' online learning, it is believed that positive interventions made on students' perceptions regarding their online learning will have an effect on their success. In this context, studies should be conducted to determine the variables that affect students' online learning self-efficacy. In this way, higher education institutions can take the opportunity to increase students' self-efficacies.

Examining studies of the concept of self-efficacy in relation to online learning, it is seen that this concept is discussed in different ways in the literature. Stating that the majority of self-efficacy studies focus on the technology dimension (computer self-efficacy, internet self-efficacy, information-seeking self-efficacy, learning management system self-efficacy), Alqurashi (2016) reports that a limited number of studies focus on general self-efficacies and the learning dimension only in online learning environments.

Examining the field literature in detail, some scales can be found that have been developed especially for online learning environments by researchers working on the self-efficacy dimension. One of these is the Online Technologies Self-Efficacy Survey Scale (OTSES) developed by Miltiadou and Yu (2000). The researchers who developed the OTSES scale state that the 29-item scale can be used in four dimensions (internet competencies, synchronous interaction, asynchronous interaction I and asynchronous interaction II) or in a single dimension. The OTSES scale was adapted into Turkish in four dimensions by Horzum and Cakir (2009), who conducted the validity and reliability analyses of the scale. The Web-Based Learning

Self-Efficacy Scale (WBLSES), developed for older adults learning online, consists of 8 items (Nahm, & Resnick 2008). Another scale created for this subject was developed by Shen, Cho, Tsai and Marra (2013) to determine higher education students' online learning self-efficacies, and consists of 35 items and 5 subscales (self-efficacy to complete an online course, self-efficacy to interact socially with classmates, self-efficacy to use a course management system, self-efficacy to interact with instructors, and self-efficacy to interact with classmates for academic purposes).

Moreover, besides the scales mentioned here, it is seen that there are also studies (Ergul, 2004; Puzziferro, 2008; Randall, 2001; Zhang, Li, Duan & Wu, 2001) aimed at determining students' self-efficacy perceptions in online learning environments, that include limited scale items related to self-efficacy used in conjunction with other psychological factors (motivation, self-regulation, self-orientation, satisfaction, etc.).

Finally, there also exists the Online Learning Self-Efficacy Scale (OLSES), the adaptation and validity-reliability analyses of which are carried out within the scope of this study. The OLSES scale was developed by Zimmerman and Kulikowich (2016) and consists of 22 items and 3 subscales (learning in the online environment, time management and technology use). The most important feature that distinguishes the OLSES scale from others is the fact that since, during the development of the scale, no significant difference was found when it was implemented with different student groups with and without online learning experience, it is stated to be suitable for use with both student profiles. Moreover, the fact that the number of items (22) in the scale is low is also important in terms of practicability. Therefore, getting valid and reliable results with large scale samples including both experienced and inexperienced people as well as measuring online self-efficacy with such a low number of Likert items directed the researchers to realize the adaptation of OLSES.

It is expected that self-efficacy scales developed for online learning environments, which are developing rapidly under the effect of technological developments, will inquire about up-to-date information and tools. Therefore, up-to-date scales that are developed can be expected to provide more accurate results that conform to current conditions. Examining the studies and scales mentioned above, it can be understood that in consideration of the features of online learning technologies, number of items and current distance learning technologies, the most suitable scale created is the OLSES scale developed by Zimmerman and Kulikowich (2016).

In this context, the aim of this research is to adapt the Online Learning Self-Efficacy Scale (OLSES), added to the field literature by Zimmerman and Kulikowich (2016), into Turkish, to analyse its validity and reliability for Turkish researchers and to interpret the results obtained from the study.

## METHOD

This research was designed as a quantitative study, and was conducted with a cross-sectional approach, which is actually a type of the survey studies. Survey studies are scanning studies carried out in a universe composed of many members, and, in order to reach a general judgement, with the entire universe or with a specific sample taken from that universe. Cross-sectional studies, however, are studies of separate groups whose development is accepted to represent various developmental stages and who are observed at a specific point in time (Karasar, 2003; Buyukozturk, Kilic-Cakmak, Akgun, Karadeniz and Demirel, 2010).

### Participants

Zimmerman and Kulikowich (2016), who obtained similar results with student groups studying in different fields and who either had or did not have online learning experience, stated that the scale can be adapted for university students who have different characteristics. In this study, with the aim of gathering data from students enrolled on different degree programmes, data were collected from students who had registered for campus-based common compulsory courses.

In the spring term of the 2017-2018 academic year at Bolu Abant **Izzet** Baysal University, there were 9,344 students taking at least one of the campus-based common compulsory courses (Principles of Atatürk and History of Turkish Revolution, Foreign Language, and Turkish Language) via distance learning. The

OLSES scale, prepared as an online questionnaire, was completed voluntarily by a total of 2,230 students. However, it was decided to remove a total of 143 students, who had incompletely or inaccurately filled in the questionnaire and were determined by the various statistical analyses, from the dataset. Therefore, the remaining 2,087 students made up the study group.

Of the students who formed the study group, 675 were male and 1,412 were female. Examining the age distribution of the students, participants' ages were observed between 17-58 (mean=20,74). Since the campus-based common compulsory courses are generally first-grade courses, when the grade levels of the students are examined, it is seen that the majority of the sample consisted of first-grade students (1,323), with 462 people from second grade, 178 people from third grade and 124 people from fourth grade. Examining the distribution of the students' school types, it is seen that out of a total of 1,406 faculty students in 10 different faculties, the majority of these were in the Education Faculty (447), the Economics and Administrative Sciences Faculty (430) and the Faculty of Science and Letters (189); that out of a total of 352 college students at 5 different colleges, the majority attended Bolu Health College (109), the College of Physical Education and Sport (70) and Gerede College of Applied Sciences (69); and that out of a total of 329 vocational school students at 7 different vocational schools, the majority were at Bolu Vocational School (91), Bolu School of Technical Sciences (86) and the Health Services School (65). Moreover, it was observed that in the university as a whole, students from 108 different departments participated in the study and that the highest participation was from the Business Administration (80), English Teaching (73) and Nursing (70) departments. Since a comparison aimed at ascertaining whether there were significant differences between departments was not undertaken, it is not important if a low number of students participated from any department. Therefore, the fact that a low number of students participated from the Ceramics Department (1), the Electronic Technology Department (1), the Physics Department (1), the Poultry Husbandry Department (1) and the Textile Technology Department (1) did not result in the removal of these data from the sample.

## The Procedure and Data Analyses

The data collection tool consisted of demographic information (gender, age distribution, grade level, school type) and the 22-item scale which is the Turkish-translated form of the Online Learning Self-Efficacy Scale. The scale items are of the 5-point likert type, and are in the form *I completely disagree* (1), *I disagree* (2), *I am undecided* (3), *I agree* (4) and *I completely agree* (5).

In order to accelerate the data collection process and to reach a greater number of participants, it was decided to implement the scale, the Turkish translation of which had been completed, as an online questionnaire via the university's learning management system (LMS). Then, the scale which was loaded into the LMS as an online questionnaire was made available to all students entering the system. The scale, which was completed voluntarily by students taking campus-based common compulsory courses via distance learning, was kept open on the LMS for a period of 4 weeks. The scale, the data collection process for which continued for 4 weeks, was answered by a total of 2,230 students.

In the study, before moving on to the data analysis, the normality distributions, linearity analysis, removal of outliers and determination of empty data were aimed at, in order to reveal whether the data were suitable for analysis and whether they met the hypothetical criteria.

For this purpose, scales in which more than five items in the item scales was left blank were excluded. In the remaining scales, in order not to alter the mean value, the mean for the relevant item was assigned to the items left blank (<23%). When determining the three values in the dataset, the Mahalanobis distances and Z scores were examined. The item scores in the scale were converted to Z scores. Z scores of all items were examined to determine whether they were between -3 and +3. Data with Z scores that were outside this range were regarded as extreme values (Cokluk, Sekercioglu and Buyukozturk, 2012). Another data assumption that needed to be examined was that of skewness and kurtosis values. Skewness and kurtosis coefficients are used to determine whether each of the items shows normal distribution (Tabachnick and Fidell, 2007). The skewness and kurtosis coefficients were calculated for the dataset collected. While examining the skewness and kurtosis coefficients, values between -2 and +2 were taken as the basis (Field, 2009). Following the extreme value and normality analyses carried out on missing or faulty data, it was decided to remove the

data of 143 students from the dataset. Moreover, Kruskal-Wallis H test was performed on the demographic variables to investigate effects of gender and school type on participants' online learning self-efficacy scores. The reason for utilizing this analyse instead of the parametric one (ANOVA) is that nature of data utilized in the study. The data came from Likert items whose scores were coded between 1 to 5 as mentioned above like as interval scale. However, researchers argue that Likert item scores should be accepted as ordinal scale, because respondents do not actually feel equivalence between these intervals (Boone & Boone, 2012; Turan, Simsek & Aslan, 2015). In other words, the distance between *completely disagree* (1) and *I disagree* (2) may be closer than the distance between *I disagree* (2) and *I am undecided* (3) according to participants.

After the outliers had been removed from the dataset, the Kaiser-Meyer-Olkin (KMO) and Bartlett sphericity tests were performed to determine adequacy of the sampling and suitability of the data for exploratory factor analysis. The fact that the KMO sampling adequacy index was over %60 and that the Bartlett sphericity test was significant ( $p < .05$ ) revealed that the data were suitable for factor analysis. The results of the KMO and Bartlett sphericity tests performed on the data are given in Table 1.

**Table 1.** KMO and Bartlett sphericity test results.

Kaiser-Meyer-Olkin measure of sampling adequacy		.981
	Chi-Square	59781.714
Bartlett sphericity test	sd	210
	Sig.	.000

As can be seen in Table 1, a KMO value of .981 was found, revealing that there was a considerably good level of sampling adequacy. The result of the Bartlett sphericity test which reveals the suitability of data for factor analysis was also found to be significant ( $X^2 = 59781.714$   $p < .05$ ). When the results obtained are evaluated, it can be seen that the sample size was adequate. Finally, principal component analysis together with oblimin rotation method was implemented to examine construct related validity of the scale results.

### Scale

The OLSES scale was developed by Zimmerman and Kulikowich in the year 2016. The scale was written in English and in its original form consists of three factors and 22 items. These factors are named *learning in the online environment* (10 items), *time management* (5 items) and *technology use* (7 items). The scale developed by Zimmerman and Kulikowich (2016) was applied to students aged 18-70 (average age 23.89) on degree programmes in different subjects on 18 different campuses of a multi-campus university. The researchers stated that they used data collected from 338 students, that 176 of the students had not previously taken courses via distance learning, and that 162 of them had previously taken one or more courses via distance learning. In the exploratory factor analysis carried out for all participants ( $N=338$ ) in the research, principal component analysis (PCA) together with the oblimin rotation method was used. According to the findings they obtained, the researchers concluded that the 3 interrelated factors explained 55.89% of the total variance. The reliability results of the scale revealed Cronbach's alphas of .890 ( $N=325$ ) for the 10-item online learning environment subscale, .855 ( $N=328$ ) for the 5-item time management subscale, and .843 ( $N=331$ ) for the 7-item technology use subscale. From the exploratory factor analysis results, the researchers concluded that the item factor loadings ranged from .59 to .81, and that the mean factor loading was .71.

### Translation Procedure

For the present research, first of all, permission to use the scale was obtained via email from the researchers who developed it, Zimmerman and Kulikowich. Then, after obtaining permission from the Human Research Ethics Committee of Bolu Abant **Izzet** Baysal University, the adaptation study was begun.

During the adaptation of the scale into Turkish, the scale was translated into Turkish, a back translation was done in order to check this, expert views were obtained, and the final form of the scale was obtained,

in that order. The Turkish translation of the original English form was done by one of the researchers and an expert in English. Then, with the aim of back-translating the Turkish version of the scale, the English translation was carried out by reciprocally exchanging the researchers' Turkish translations. The translations that were made was discussed by four instructors, namely the expert in English, the researchers and an expert in computer education and instructional technology (CEIT), a joint decision was made, and the final form of the scale was obtained. As a result of the reviews made, certain changes were made to the scale. Besides vocabulary and predicate changes, it was decided to convert the 6-point likert scale of the original version to a 5-point likert scale in order to make it more practicable.

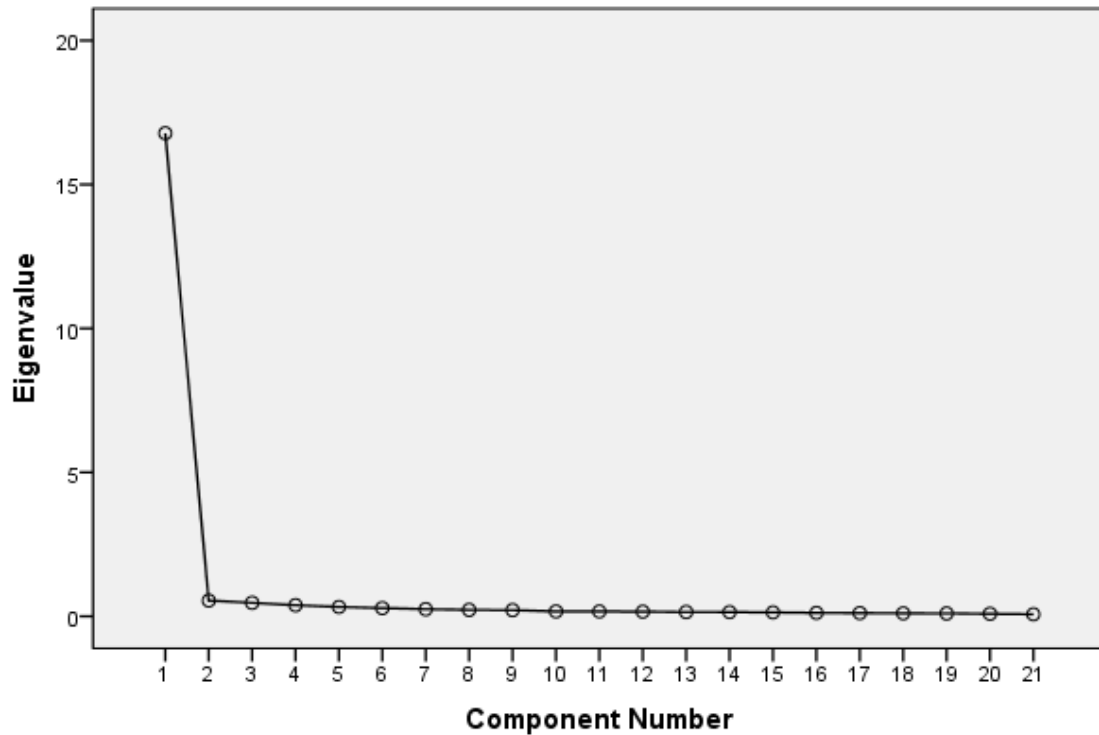
## FINDINGS

To examine what kind of structure was revealed by the Turkish form of the scale in the adaptation study, exploratory factor analysis was performed. As in the original scale, in the exploratory factor analysis, principal component analysis and the oblimin rotation method were used. Following the factor analysis performed, the scale appeared in a single-dimension structure and when the factor loadings were examined, it was seen that the factor loading of -.154 in the 2nd item was below  $<.40$ . It is recommended that items with factor loadings below  $.40$  are excluded from a scale (Stevens, 1996). Therefore, the 2nd item was removed from the scale and the analysis was repeated. The factor loading distributions of the scale items are shown in Table 2.

**Table 2.** Factor loading distributions of OLSES scale items

Items	Factor Loading
Item 1	.859
Item 3	.894
Item 4	.887
Item 5	.875
Item 6	.858
Item 7	.917
Item 8	.912
Item 9	.908
Item 10	.913
Item 11	.845
Item 12	.882
Item 13	.910
Item 14	.921
Item 15	.918
Item 16	.913
Item 17	.897
Item 18	.906
Item 19	.862
Item 20	.894
Item 21	.896
Item 22	.898
Eigenvalue (total)	16.781
Explained total variance (%)	79.908

Examining the above table, it is seen that the factor loading distributions of the items ranged between .845 and .921 and that the mean factor loading value was .894. Moreover, it can be seen that the total eigenvalue of the scale was 16.78 and that this explained 79.91% of the total variance. When the three-factor structure in the original scale was applied to Turkish students, a single-factor structure was formed. The single-factor structure created by the 21 items (the 2nd item found in the original scale was removed) following the exploratory factor analysis can also be seen in the scatter plot in Figure 1.



**Figure 1.** Scatter plot for exploratory factor analysis

For the reliability study, the internal consistency coefficient (Cronbach's alpha) was examined. The statistical analysis performed for this purpose revealed a Cronbach's alpha value of .987 for the online self-efficacy scale. In the original (English) form of the scale, the reliability coefficients for the three subscales ranged between .843 and .890. According to the reliability result obtained from the adaptation study, it can be said that the scale has a high degree of reliability. When it comes to the descriptive statistics, median and mode scores were utilized instead of mean scores since the data were collected through a Likert scale (Boone & Boone, 2012). Also, range was preferred instead of standard deviation, because of the similar reasons. Those descriptive statistics was presented in Table 4.

**Table 4.** Self-efficacy scale item scores of university students

Items	Mode	Median	Range
1. Navigate online course materials efficiently.	4	3	4
2. Communicate effectively with my instructor via e-mail.	4	4	4
3. Communicate effectively with technical support via e-mail, telephone, or live online chat.	4	4	4
4. Submit assignments to an online dropbox.	4	3	4
5. Overcome technical difficulties on my own.	3	3	4
6. Navigate the online grade book.	4	4	4
7. Manage time effectively.	4	4	4
8. Complete all assignments on time.	4	4	4
9. Learn to use a new type of technology efficiently.	4	4	4
10. Learn without being in the same room as the instructor.	3	3	4
11. Learn without being in the same room as other students.	4	4	4
12. Search the Internet to find the answer to a course-related question.	4	4	4
13. Search the online course materials.	4	4	4
14. Communicate using asynchronous technologies (discussion boards, e-mail, etc.)	4	4	4
15. Meet deadlines with very few reminders.	4	4	4
16. Complete a group project entirely online.	3	3	4
17. Use synchronous technology to communicate with others (such as Skype).	4	4	4
18. Focus on schoolwork when faced with distractions.	3	3	4
19. Develop and follow a plan for completing all required work on time.	4	4	4
20. Use the library's online resources efficiently.	4	4	4
21. When a problem arises, promptly ask questions in the appropriate forum (e-mail, discussion board, etc.)	4	4	4

Note. \* 2nd item was removed from scale following factor analysis.

Examining the scores related to the items determining the online self-efficacy perceptions of the university students in Table 4, it is seen that the item scores were generally close to each other. When the median scores for the items are examined, it is seen that these scores in items 1, 5, 6, 11, 17 and 19 presented the lowest scores. However, 3 as the midpoint (in range of 1-5) score still does not correspond to a low score. From this descriptive analyse it can be said that participants' feel themselves self efficacious related to online learning environments.

In the inferential analyses made for the students' total scale scores, the gender and school type variables were taken into consideration. In this context, when the total self-efficacy scores of the university students were compared according to the gender variable, the following table was obtained.

**Table 5.** University students' self-efficacy scores according to gender

Groups	N	Mean Rank	Sd	$\chi^2$	p
Male	675	1032.10	1	.390	.532
Female	1412	1049.69			



When the university students' self-efficacy scores were examined according to their gender, it is seen that male and female students had mean rank scores close to each other. Female participants' mean rank score were slightly higher than those of male students. However, the results of the Kruskal-Wallis H test indicated that there was not a significant difference in total self-efficacy scores of the university students in terms of gender ( $X^2=.390$ ,  $p>.05$ ). When the total self-efficacy scores of the university students were compared according to the type of school they attended, the following table was obtained.

**Table 6.** University students' self-efficacy scores according to school type

Groups	N	Mean Rank	Sd	$\chi^2$	p
Faculty	1406	1042.67			
College	352	1070.11	2	1.120	.571
Vocational School	329	1021.74			

When the participants' self-efficacy scores were investigated in terms of their school type, it is seen that faculty, college and vocational school students had mean rank scores close to each other. College students' mean rank score were slightly higher than students of other school. However, the results of the Kruskal-Wallis H test indicated that there was not a significant difference in total self-efficacy scores of the university students in accordance to their school type ( $X^2=1.120$ ,  $p>.05$ ).

## CONCLUSION

In this study, the Turkish adaptation study of the Online Learning Self-Efficacy Scale (OLSES) developed by Zimmerman and Kulikowich (2016), and aimed at university students with and without online learning experience, was conducted, and the obtained results were analysed with reference to the university students' gender and school type variables.

The translation of the scale into Turkish was made by language and field experts, and the Turkish form was compared with the original English form by means of back-translation into English. The items in the translations that best expressed the original scale were selected through discussion by the language and field experts (a total of four instructors). For the structural validity of the scale, exploratory factor analysis was performed. Following the factor analysis, a single-dimension scale appeared. Since the 2nd item of the scale items had a factor loading of less than .40, it was removed from the scale. According to the analysis results of the 21-item, single-dimension structure of the OLSES scale, it was seen that the factor loading distribution of the items varied between .845 and .921, and that the mean factor loading value was .894. Moreover, it was seen that the total eigenvalue of the scale was 16.78 and that this explained 79.91% of the total variance. The internal consistency coefficient (Cronbach's alpha) of the scale was .987, indicating a high degree of reliability.

The fact that the three-dimensional structure formed in the original scale appeared as a single dimension in the Turkish form may be considered to be due to cultural differences. Furthermore, the need to remove the 2nd item, "*Find the course syllabus online*", from the scale may be considered to be due to the conflicting responses given by the students. Approximately 38 teaching staff are assigned to the campus-based common courses at the relevant university. Although it is recommended by the distance learning centre that the lesson programme be loaded into the distance learning system, it appears that some course instructors did not load the programmes onto the relevant learning page. Due to this situation, although a section of the students were able to access the lesson programmes, another group of them were unable to access the page relevant to their lesson programme even if they wished to. Because of the restriction mentioned above, the scale can be validated in further studies in which the 2nd item is also included. However, it is not anticipated that this situation will cause a change in the factor structure of the scale.

In conclusion, the proofs related to the validity and reliability of the single-dimension inventory made up of 21 items for the OLSES scale prepared for online learning environments were obtained in its Turkish form. This inventory, which can be used in Turkish, can be utilised for determining the self-efficacies of individuals especially in online learning environments. Moreover, it is anticipated that the scale can be used for students both with and without online learning experience and that it will produce similar results for both groups.

During the research, inferential analyses of the data obtained from the students were made with regard to the variables of gender and school type. In this context, although the median scores according to the gender of the university students were relatively higher in favour of female students, it was concluded that the difference between the genders was not statistically significant. Although this finding is contrary to the research findings of Shen, Cho, Tsai and Marra (2013) and Chang, Liu, Sung, Lin, Chen and Cheng (2014), similar findings were obtained in some studies in the literature (Akkoyunlu and Orhan, 2003; Ergul, 2004; Hung, Chou, Chen and Own 2010). Besides, when the total self-efficacy scores of the university students was examined, it was concluded that gender had no effect on self-efficacy perception.

In the analyses performed to determine the university students' total self-efficacy scores according to type of school, it was seen that generally, all groups had a high level of self-efficacy. The median scores of vocational school students were observed to be relatively lower than those of faculty and college students. However, according to the results of the Kruskal Wallis H test performed, this difference was not found to be statistically significant. There are studies in the field literature which reveal that no significant differences were found among students' self-efficacies with regard to similar distance learning programmes (Kuo, Walker, Schroder and Belland, 2014; Ozturk, 2015). Therefore, university students' total self-efficacy scores were examined, it was concluded that there was no effect at all in terms of their school type.

The OLSES scale, the Turkish adaptation of which was carried out within the scope of this research, can be used to define the areas that students perceive as weaknesses. This information can be used to define interventions aimed at improving students' online learning self-efficacy (Zimmerman and Kulikowich, 2016).

When the research findings are considered, different psychological variables that can affect students' success must be identified together with self-efficacy perception, which is an important psychological variable in university students' online learning environments. If several psychological variables are evaluated at the same time, the relationships between the variables and the demographic factors can be defined, and factors that may affect students' success and satisfaction can be revealed. In this way, interventions can be carried out by higher education institutions that will contribute to students' success.

**Acknowledgements:** This study is supported by Bolu Abant Izzet Baysal University Projects of Scientific Investigation, Project Number: 2018.02.01.1345.

## BIODATA and CONTACT ADDRESSES of AUTHORS



**Dr. Nuh YAVUZALP**, has received his BSc degree in computer teacher education from Firat University in Turkey and his MSc degree in educational sciences department of Firat University. Dr. YAVUZALP has received his doctoral degree (PhD) in educational sciences department of Firat University. He has studied as a researcher in Bolu Abant Izzet Baysal University since 2013. His research interests include instructional technologies, e-learning and distance education. He has over than 3 journal articles published in international indexes, 1 international book chapter and other national and international articles, papers submitted to international meetings.

Dr. Nuh YAVUZALP

Department of Computer Education & Instructional Technologies, Faculty of Education

Address: Bolu Abant Izzet Baysal University, 14030, Bolu, Turkey

Phone: +90 374 2541000,

E-mail: [nuhyavuzalp@gmail.com](mailto:nuhyavuzalp@gmail.com)



**Assoc. Prof. Dr. Eralp BAHCIIVAN**, has received his bachelor, master's and doctoral degree (in 2012) on science teacher education from Middle East Technical University, Turkey. He has studied as a researcher in Bolu Abant Izzet Baysal University since 2013. His research has mainly focused on epistemological beliefs, teaching belief systems and pedagogical content knowledge of in-service and pre-service teachers. He has over than 30 journal articles published in international indexes, 2 international book chapters and other national and international articles, papers submitted to international meetings.

Dr. Eralp BAHCIIVAN

Department of Science Education, Faculty of Education

Address: Bolu Abant Izzet Baysal University, 14030, Bolu, Turkey

Phone: +90 374 2541000,

E-mail: [eralpbahcivan@hotmail.com](mailto:eralpbahcivan@hotmail.com)

## REFERENCES

- Akkoyunlu, B., & Orhan, F. (2003). Bilgisayar ve ogretim teknolojileri egitimi (BOTE) bolumu ogrencilerinin bilgisayar kullanma oz yeterlik inanci ile demografik ozellikleri arasindaki iliski [English title is not available in the original manuscript]. *The Turkish Online Journal of Educational Technology*, 2(3), 86-93.
- Alivernini, F., & Lucidi, F. (2011). Relationship between social context, self-efficacy, motivation, academic achievement, and intention to drop out of high school: A longitudinal study. *The Journal of Educational Research*, 104(4), 241-252. <https://doi.org/10.1080/00220671003728062>
- Alqurashi, E. (2016). Self-efficacy in online learning environments: A literature review. *Contemporary Issues in Education Research*, 9(1), 45-52. <https://doi.org/10.19030/cier.v9i1.9549>
- Askar, P. ve Umay, A. (2001). İlkogretim matematik ogretmenligi ogrencilerinin bilgisayarla ilgili oz-yeterlik algisi [Perceived computer self-efficacy of the students in the elementary mathematics teaching programme]. *Hacettepe University Journal of Education*, 21, 1-8.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behaviour change. *Psychological Review*, 84, 191-215. <http://dx.doi.org/10.1037/0033-295X.84.2.191>
- Boone, H. N., & Boone, D. A. (2012). Analyzing likert data. *Journal of Extension*, 50(2), 1-5.
- Buyukozturk, S., Kilic-Cakmak, E., Akgun, O.E., Karadeniz, S. ve Demirel, F. (2010). *Bilimsel Arastirma Yontemleri [Scientific Research Method]* (6th Edition). Ankara: Pegem Akademi.
- Chang, C. S., Liu, E. Z. F., Sung, H. Y., Lin, C. H., Chen, N. S., & Cheng, S. S. (2014). Effects of online college student's Internet self-efficacy on learning motivation and performance. *Innovations in education and teaching international*, 51(4), 366-377. <https://doi.org/10.1080/14703297.2013.771429>
- Cokluk, O., Sekercioglu, G., & Buyukozturk, S. (2010). *Sosyal bilimler icin cok degiskenli istatistik: SPSS ve Lisrel uygulamalari [Multivariate statistics for social sciences: SPSS and Lisrel applications]*. Ankara: Pegem Akademi.
- Ergul, H. (2004). Relationship between student characteristics and academic achievement in distance education and application on students of Anadolu University. *Turkish Online Journal of Distance Education-TOJDE*, 5(2), 81-90.
- Field, A. (2009). *Discovering statistics using SPSS*. London: Sage Publications.
- Hodges, C. B. (2008). Self-efficacy in the context of online learning environments: A review of the literature and directions for research. *Performance Improvement Quarterly*, 20 (3-4), 7-25. <https://doi.org/10.1002/piq.20001>

- Horzum, M. B., & Cakir, O. (2009). Cevrim ici teknolojilere yonelik oz-yeterlik algisi olcegi Turkce formunun gecerlik ve guvenirlilik calismasi [Validity and reliability study of the turkish version of the online technologies self-efficacy scale]. *Educational Sciences: Teory & Practice*, 9(3), 1327-1356.
- Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, 55(3), 1080-1090. <https://doi.org/10.1016/j.compedu.2010.05.004>
- Karasar, N. (2003). *Bilimsel Arastirma Yontemi [Scientific Research Method]*. Ankara: Nobel Yayınevi.
- Kuo, Y. C., Walker, A. E., Schroder, K. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education*, 20, 35-50. <https://doi.org/10.1016/j.iheduc.2013.10.001>
- Lim, C. K. (2001). Computer self-efficacy, academic self-concept, and other predictors of satisfaction and future participation of adult distance learners. *American Journal of Distance Education*, 15(2), 41-51. <https://doi.org/10.1080/08923640109527083>
- Miltiadou, M., & Yu, C.H. (2000). Validation of the online technologies self-efficacy survey (OTSSES). *Association for Educational Communications and Technology (AECT) International Convention. (ERIC Document Reproduction Service No. ED. 445672)*. <https://files.eric.ed.gov/fulltext/ED445672.pdf>
- Nahm, E. S., & Resnick, B. (2008). Development and testing of the Web-Based Learning Self-Efficacy Scale (WBLSES) for older adults. *Ageing International*, 32(1), 3-14. <https://doi.org/10.1007/s12126-008-9003-6>
- Onal, N., & Ibili, E. (2017). E-ogrenme ortamlari [E-learning environment]. In S. Sahin & C. Uluyol (Eds.), *Egitimde Bilisim Teknolojileri [Information Technology in Education]* (520-538). Ankara: Pegem Akademi.
- Ozturk, P. (2015). Yetiskin egitiminde kullanılan bir cevrimici ogrenme ortaminin, cevrimici oz yeterlik algisi ve akademik basariya etkisinin incelenmesi [Investigation of effects on online self-efficacy perception and academic achievement of an online learning enviroment used in adult education]. (Master's dissertation). Yildiz Technical University Graduate School of Sciences, Istanbul, Turkey. Available from the Council of Higher Education, National Dissertation Center, Dissertation ID: 414230.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of educational research*, 66(4), 543-578.
- Puzziferro, M. (2008). Online technologies self-efficacy and self-regulated learning as predictors of final grade and satisfaction in college-level online courses. *The American Journal of Distance Education*, 22(2), 72-89. <https://doi.org/10.1080/08923640802039024>
- Randall, F. A. (2001). Factor analysis of online instruction self-efficacy using the Tennessee online instruction survey. (Doctoral dissertation). University of Tennessee, Knoxville. Available from [https://trace.tennessee.edu/utk\\_graddiss/2649/](https://trace.tennessee.edu/utk_graddiss/2649/)
- Shen, D., Cho, M. H., Tsai, C. L., & Marra, R. (2013). Unpacking online learning experiences: Online learning self-efficacy and learning satisfaction. *The Internet and Higher Education*, 19, 10-17. <https://doi.org/10.1016/j.iheduc.2013.04.001>
- Stevens, J. (1996). *Applied multivariate statistics for the social science* (3rd ed.). Mahwah, NJ: Erlbaum.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Needham Heights MA: Allyn & Bacon.
- Taipjutorus, W., Hansen, S., & Brown, M. (2012). Improving Learners' Self-efficacy in a learner-controlled online learning environment: a correlational study. M. Brown, M. Harnett & T. Stewart (Ed.) *Future Challenges, sustainable futures. Proceedings ASCILITE Wellington*. 907-911.
- Turan, I., Simsek, U., & Aslan, H. (2015). Egitim arastirmalarinda likert olcegi ve likert-tipi sorularin kullanimi ve analizi [The use and analysis of likert scales and likert-type items in educational research]. *Sakarya Universitesi Egitim Fakultesi Dergisi*, (30), 186-203.

- Zhang, J., Li, F., Duan, C., & Wu, G. (2001). Research on self-efficacy of distance learning and its influence to learners' attainments. In C. H. Lee (Ed.), *Proceedings of the International Conference on Computers in Education (ICCE)/SchoolNet 2001* (pp. 1510–1517). Incheon, South Korea: Incheon National University of Education.
- Zimmerman, B. J. (1995). *Self-efficacy and educational development*. In A. Bandura (Ed.), *Self-efficacy in changing societies*. New York: Cambridge University Press (pp. 202-231). <https://doi.org/10.1017/cbo9780511527692.009>
- Zimmerman, W. A., & Kulikowich, J. M. (2016). Online learning self-efficacy in students with and without online learning experience. *American Journal of Distance Education*, 30(3), 180-191. <https://doi.org/10.1080/08923647.2016.1193801>

## APPENDIX

### Cevrimici Ogrenme Oz-Yeterlik Olcegi [Online Learning Self-Efficacy Scale]\*

		Hic Katilmiyorum	Katilmiyorum	Kararsizim	Katiliyorum	Tamamen Katiliyorum
1.	Cevrimici (online) ders materyalleri arasinda etkili bir sekilde gezinebilirim.					
2.	Cevrimici (online) ders izlencesini bulabilirim.					
3.	E-posta yoluyla dersin ogretim elemani ile etkili iletisim kurabilirim.					
4.	Teknik destek ile e-posta, telefon veya canli cevrimici (online) sohbet yoluyla etkili bir sekilde iletisim kurabilirim.					
5.	Odevleri cevrimici (online) bir depolama alanina (Dropbox, Google Drive, Yandex Disk, One Drive vb.) yukleyebilirim.					
6.	Kendi kendime teknik sorunlarin ustesinden gelebilirim.					
7.	Cevrimici (online) olarak yayimlanan notlarimi (odev, sinav vb.) ogrenebilirim.					
8.	Zamani etkili bir sekilde kullanabilirim.					
9.	Tum odevlerimi zamaninda tamamlayabilirim.					
10.	Yeni bir teknolojiyi etkili bir sekilde kullanmayi ogrenebilirim.					
11.	Ogretim elemani ile ayni sinif ortaminda olmadan ogrenebilirim.					
12.	Siniftaki diger ogrenciler ile ayni sinif ortaminda olmadan ogrenebilirim.					
13.	Ders ile ilgili bir sorunun cevabini bulmak icin internet'te arama yapabilirim.					
14.	Ders ile ilgili materyalleri internete arayabilirim.					
15.	Eszamansiz teknolojiler (tartisma grubu, mesaj panosu, e-posta vb.) kullanarak iletisim kurabilirim.					
16.	Cok az hatirlatici ile cevrimici (online) gorevlerin son teslim zamanina uyabilirim.					
17.	Bir grup projesini internet uzerinden cevrimici (online) olarak tamamlayabilirim.					
18.	Baskariyla iletisim kurmak icin eszamanli teknolojileri (Skype, WhatsApp, Messenger vb.) kullanabilirim.					
19.	Dikkat dagitici bir sey ile karsilastigim zaman okul calismalarına odaklanabilirim.					
20.	Gerekli calismaların tumunu zamanında tamamlamak için bir plan geliştirebilir ve uygulayabilirim.					
21.	Kutuphanenin cevrimici (online) kaynaklarını verimli bir şekilde kullanabilirim.					
22.	Bir problem ortaya çıktığında, uygun bir cevrimici (online) tartisma grubunda (e-posta, tartisma panosu, WhatsApp grup, Facebook grup vb.) problemi sorabilirim.					

Note. \* 2nd item was removed from scale following factor analysis.