

STUDENTS' ATTITUDES TOWARDS EDMODO, A SOCIAL LEARNING NETWORK: A SCALE DEVELOPMENT STUDY

Eyup YUNKUL
Necatibey Faculty of Education
Balikesir University, Balikesir, Turkey

Serkan CANKAYA
Necatibey Faculty of Education
Balikesir University, Balikesir, Turkey

ABSTRACT

Social Learning Networks (SLNs) are the developed forms of Social Network Sites (SNSs) adapted to educational environments, and they are used by quite a large population throughout the world. In addition, in related literature, there is no scale for the measurement of students' attitudes towards such sites. The purpose of this study was to develop a scale to determine students' attitudes towards Edmodo, a Social Learning Network (Edmodo Attitude Scale, EAS). The scale development process included reviewing the related literature, developing an item pool, asking for expert's views, developing a draft form, carrying out two different applications for exploratory and confirmatory factor analyses and conducting validity and reliability analyses. The scale was developed in Turkish and applied online. The participants of the study were selected among undergraduate students who experienced Edmodo in a university in Turkey. At the end of the research process, a scale made up of 18 items and 4 factors was developed. The factors were found to be collaboration, usefulness, instructor support and self-confidence. Consequently, the scale could be said to be a valid and reliable attitude scale that could be used in learning environments which involves the use of a SLN.

Keywords: Edmodo, Edmodo attitude scale, scale development, social learning network.

INTRODUCTION

Obviously, although a number of universities have a substructure allowing integration of Social Networking Sites (SNSs) into learning environments (Tess, 2013), they do not favor such integration at all since these environments are for personal use and for socialization (Hew, 2011). In addition, it is a well-known fact that students tend to consider social lives (pleasure) separate from learning (pain) (Jones, Blackey, Fitzgibbon, & Chew, 2010; Rambe, 2013). Also, there are studies demonstrating that both students and teachers might not feel content with being friends with each other on Facebook (Rambe, 2013; Warner & Esposito, 2009) and that they might develop anxiety regarding the issues of privacy and safety (Brady, Holcomb, & Smith, 2010). In this respect, it is seen that use of SNSs as an e-learning platform may not be a good idea (Balakrishnan, Kooi, & Pourgholaminejad, 2015).

On the other hand, it could be stated that students intensively use Social Network Sites (SNS) and that they are fairly knowledgeable about the use of these sites (Bosch, 2009; Feng & Xie, 2014; Kabilan, Ahmad, & Abidin, 2010; Odabasi et al., 2012; Selwyn, 2009; Tonta, 2009). Despite the negative aspects mentioned above, there are several studies pointing out that

SNSs could contribute positively to students' success when used in educational environments (Al-Rahmi & Othman, 2013; Ekici & Kiyici, 2012; Forkosh-Baruch & HersHKovitz, 2012; Grosseck, Bran, & Tiru, 2011; Hung & Yuen, 2010; Junco, Heiberger, & Loken, 2011; Kabilan et al., 2010; Lawson, Kleinholz, & Bodle, 2011; Mazer, Murphy, & Simonds, 2007, 2009; Wodzicki, Schwämmlein, & Moskaliuk, 2012). As a result, in order to make use of the potential of SNSs and to get rid of their negative aspects, websites which were specifically designed for educational environments and which function like SNSs were developed. It is seen in related literature that such websites are called Social Learning Networks (SLN) (Al-kathiri, 2015; Balasubramanian, Jaykumar, & Fukey, 2014; Bicen, 2015; Trust, 2012). The websites of Edmodo, Ning, Elgg and ValuePulse are those serving that purpose (Cankaya, Durak, & Yunkul, 2014). SLNs provide such educational advantages found in SNS as student-student and student-teacher interactions, writing skills, involvement in learning processes (Ajjan & Hartshorne, 2008; Kert & Kert, 2010) and developing the sense of community (Brady et al., 2010). In addition, SLNs do not include the negative aspects of SNSs mentioned above. On the contrary, SLNs have beneficial tools used for educational purposes and found in Learning Management Systems (LMS) (library, examination, assignments and so on) (Cankaya et al., 2014). Moreover, in a study, it was reported that most students were not satisfied with the e-learning platform, a kind of LMS, used in their schools and that the reason for this dissatisfaction was the lack of social interaction (Balakrishnan et al., 2015).

Today, Edmodo is the most common SLN. Edmodo, established in 2008, has currently reached more than 62 million users (<https://www.edmodo.com/about>). Among the factors influential of such spread of Edmodo is the fact that it is total free of charge; it provides an easy sign-up procedure for membership and supports multiple languages; that it includes a number of features expected from an SNS besides its educational features; that it has a design similar to SNSs in terms of use; and that students and teachers as well as parents can easily register to the system (Durak, Cankaya, & Yunkul, 2014). Edmodo allows using the power of social media in educational environment. For teachers and students, it creates a safe environment in terms of cooperation, feedback, customized learning and several other related respects. In terms of students, it provides independence of time and place and allows exchanging ideas and information.

In literature, there are several studies conducted on the use of Edmodo in educational environments (Cankaya et al., 2014; Kongchan, 2008; Sanders, 2012), and the number of these studies is gradually increasing in line with the rapid development of Edmodo. When the related literature is examined, it is seen that there are qualitative studies carried out with small samples to determine the participants' views about SLNs. However, in literature, there is no attitude scale developed to collect data regarding SLNs via a large research sample. Currently, there is a need for a scale to determine students' attitudes towards SLNs becoming increasingly common in today's world of education. The purpose of this study was to develop a scale (Edmodo Attitude Scale-EAS) so as to determine students' attitudes towards Edmodo, a Social Learning Network.

METHOD

In the present study, the survey model was used to develop a scale for determining undergraduate students' attitudes towards Edmodo. This part of the study presents the study group, the phases of development of the measurement tool, and the reliability and validity studies carried out during the analysis of the data.

Participants

The participants of the study were students attending Necatibey Education Faculty of Balıkesir University in the Spring Term of the academic year of 2014-2015. In the study, for the selection

of the participants, the convenient sampling method was used, and a total of 298 participants took part in the phase of exploratory factor analysis (Table 1). As for the confirmatory factor analysis conducted in the second phase of the process, a total of 169 students were reached who were all different from those in the previous research sample (

Table 2. Profile of the participants (II. Implementation). In the study, all the participants, who were from various departments, had used Edmodo, a SLN, at least in one of their courses.

Table 1. Profile of the participants (I. Implementation)

		Frequency	Percent (%)
Gender	Male	160	53,7
	Female	138	46,3

Table 2. Profile of the participants (II. Implementation)

		Frequency	Percent (%)
Gender	Male	82	48,5
	Female	87	51,5

Developmental Phases of the Measurement Tool

In studies conducted in the field of social sciences, a scale development process includes the following phases after the problem and the sub-problems have been defined (Buyukozturk, Kilic Cakmak, Akgun, Karadeniz & Demirel, 2010):

- Developing the draft form by preparing the items,
- Developing the form for preliminary application in line with expert views,
- Conducting the preliminary application and finalizing the scale in line with the results of the analysis

Developing the draft form by preparing the items

Before preparing the draft form, the scales and studies related to SLNs reported in literature were examined. Although there were attitude scales regarding SNSs, it was seen that there was no study directly measuring attitudes towards SLNs. The items to be included in the scale were determined in line with the results of studies especially which aimed at determining students' views about SLNs (Cankaya et al., 2014; Sanders, 2012; Wolf, Wolf, Frawley, Torres, & Wolf, 2012). In addition, with the help of attitude scales developed for SNSs (Deniz, 2012), the attitude statements were formed. These attitude statements were prepared together with experts and faculty members who had experience in SLNs. While determining the items, the negative statements as well as positive ones were included. Also, the items found in the draft form were prepared in relation to each of the cognitive, affective and behavioral dimensions of attitude (Reid, 2006). Consequently, a 50-item pool was formed.

Developing the form for preliminary application in line with expert views

For content validity, five experts with experience in SLNs were requested to focus on each of the items and to state whether each item was necessary, appropriate in content and comprehensible as well as under which dimension each item should be evaluated. All the experts had a doctorate degree. One of them was an instructor, the other four were research assistants. In this phase, an evaluation form, which included a space under each item for the experts to take notes regarding their evaluations, was prepared. Regarding the appropriateness of the items, the experts were asked to rate each item as follows: (1) Item is appropriate, (2) Item should be revised, (3) Item should be attentively revised, and (4) Item is not appropriate. In addition, the experts were asked to select one of the options above for each item. Among the 50 items found in the pool, those reported by experts to measure the same attitude and those found inappropriate were excluded from the item pool. Eventually, the remaining number of items in the pool was found to be 37.

Conducting the preliminary application

The items in the draft form were put in random order and transformed into a five-point Likert-type scale form. The reason is that Likert-type scales are considered to be the most useful scales (Cetin, 2006). In this respect, the scale was rated as "I Completely Agree", "I Agree", "I am Neutral", "I Disagree" and "I Completely Disagree". The attitude statements in the pool were read by 15 students, and the necessary corrections were made on the items that were hard to understand.

Analysis of Data

Depending on the data collected via the preliminary application, the reliability and validity studies were conducted on the scale. In this respect, exploratory and confirmatory factor analyses were carried out.

FINDINGS

Exploratory Factor Analysis

In this phase of the study, Exploratory Factor Analysis (EFA) was conducted to determine the structures obtained via the investigation of the relationship between variables. In other words, the factors formed by the items looking similar due to the relationships in-between. For this purpose, depending on the data collected from 298 participants, principle component analysis was run, and the result of the KMO test was found to be 0.82. In the process of forming a good factor, it is important to reduce the number of items, to have a minimum correlation between factors, and to have meaningful factors (Buyukozturk, 2013). The factors obtained as a result of varimax rotation were interpreted and named. While forming the factors, the components with an Eigenvalue higher than 1, which is used for determining the number of factors, were selected. In addition, the items with a factor load lower than .50, which thus had a low level correlation with the factor, were excluded. As can be seen in Table 3, the factor loads of the items were higher than .50 meaning that the items measured the related factor well (Buyukozturk, 2013, p. 134). Table 3 demonstrates the items found in the scale and the factor loads for these items (Original scale is in Turkish and given in Appendix 1).

Table 3. Scale Items and Factor Loads for the Items

Factors and Items	Variance Explained	x	SD	Item Total Correlation (r)	Factor Load
Collaboration					
I1. I like sharing in courses executed via Edmodo.	%18.9	3.81	.685	.462	.808
I2. I believe my sharings in Edmodo are beneficial for my friends.		4.03	.609	.423	.698
I3. I think Edmodo contributes to communication between students.		3.91	.808	.499	.660
I4. I think my group friends' sharings via Edmodo contribute to my learning.		4.00	.771	.527	.569
I5. I like following the sharings in courses executed via Edmodo.		3.89	.689	.656	.544
I6. My friends and I can easily share with each other via Edmodo.		4.1	.601	.542	.543
I7. I think a course executed via Edmodo have negative influence on group work.		4.08	.653	.520	.532

Usefulness					
I8. I believe there is no need for Edmodo because there are such websites available as Facebook.		4.38	.692	.445	.758
I9. I think Edmodo involves innovative technologies beneficial for education.		4.21	.671	.441	.642
I10. I think following a course via Edmodo is boring.		4.20	.664	.507	.600
I11. I think Edmodo does not distract attention as it does not include any irrelevant or unnecessary content just as Facebook does.	%15	4.01	.657	.390	.539
I12. I believe Edmodo increases my motivation in the course.		3.74	.834	.507	.529
I13. I think Edmodo provides more opportunities to access sources and materials.		4.13	.764	.509	.528
Instructor Support					
I14. I think faculty members can provide students with faster feedback for their questions thanks to Edmodo.		3.58	.823	.354	.815
I15. I think I can easily communicate with faculty members in courses executed via Edmodo.	%13.35	3.77	.833	.516	.806
I16. I think Edmodo contributes to communication between students and teachers.		3.89	.855	.528	.612
Self-confidence					
I17. I think I participate more in courses if they are executed via Edmodo.		3.57	.816	.505	.646
I18. I think I can express my thoughts more freely in courses executed via Edmodo.	%9,86	3.66	.785	.413	.869

According to Table 3, a structure made up of four factors and 18 items which explained 57.1% of the total variance was obtained. These factors were *Cooperation* with seven items explaining 18.9% of the total variance, *Usefulness* with six items explaining 15% of the total variance, *Instructor Support* with three items explaining 13,35% of the total variance and lastly *Self-confidence* with two items explaining 9,86% of the total variance.

The Component Number and Eigenvalue presented in Figure 1 demonstrated that the Eigenvalue dramatically decreased after the first factor, and it could thus be stated that the scale had a general factor. In addition, the inclination observed to demonstrate a lower decrease when compared to the first factor constitute another set of data showing that the scale had a four-factor structure (Buyukozturk, 2013).

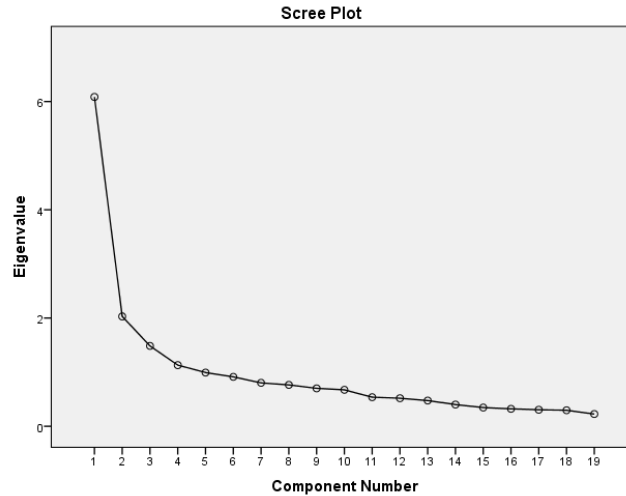


Figure 1. Eigenvalues

Confirmatory Factor Analysis

In the study, in order to determine whether the four-factor structure obtained as a result of EFA was acceptable or not, Confirmatory Factor Analysis (CFA) was conducted using the software of IBM AMOS 21. The KMO value was found to be 0.89, and this result demonstrated that the number of participants was enough.

The goodness of fit statistics used for the confirmatory factor analysis included the ratio of Chi-square (χ^2) and the degree of freedom (df2), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residuals (SRMR), CFI (comparative fit index) and GFI (Goodness of Fit Index) values (Ilhan, Sekerci, & Yildirim, 2013; Simsek, 2007). Table 4 presents the goodness of fit values obtained as a result of confirmatory factor analysis.

Table 4. Goodness of Fit Values Obtained via CFA

	Criterion	Value	Reference
χ^2	$0 \leq \chi^2 \leq 2df$	160,63<360	(Yilmaz & Celik, 2009)
χ^2/df	$0 \leq \chi^2/df \leq 2$	1,265	(Tabachnick & Fidell, 2005)
P	$0 \leq p \leq 0,05$	0,023	(Joreskog & Sorbom, 1993)
RMSEA	$0 \leq RMSEA \leq 0.08$	0.04	(Steiger, 2007)
SRMR	$0 \leq S-RMR \leq 0.10$	0.03	(Kline, 2015, p. 278)
CFI	$0.95 \leq CFI \leq 1.00$	0.97	(Schermelleh-Engel, Moosbrugger, & Müller, 2003)
GFI	$0.90 \leq GFI \leq 1.00$	0.91	(Schermelleh-Engel et al., 2003)

As can be seen in Table 4, χ^2 value was calculated as 160.63; χ^2/df as 1.265; RMSEA as 0.04; and RMR value was calculated as 0.03. The model obtained revealed that the factors were confirmed since the goodness of fit values were in acceptable ranges. Figure 2 presents factorial model for the scale and the values for the fit model.

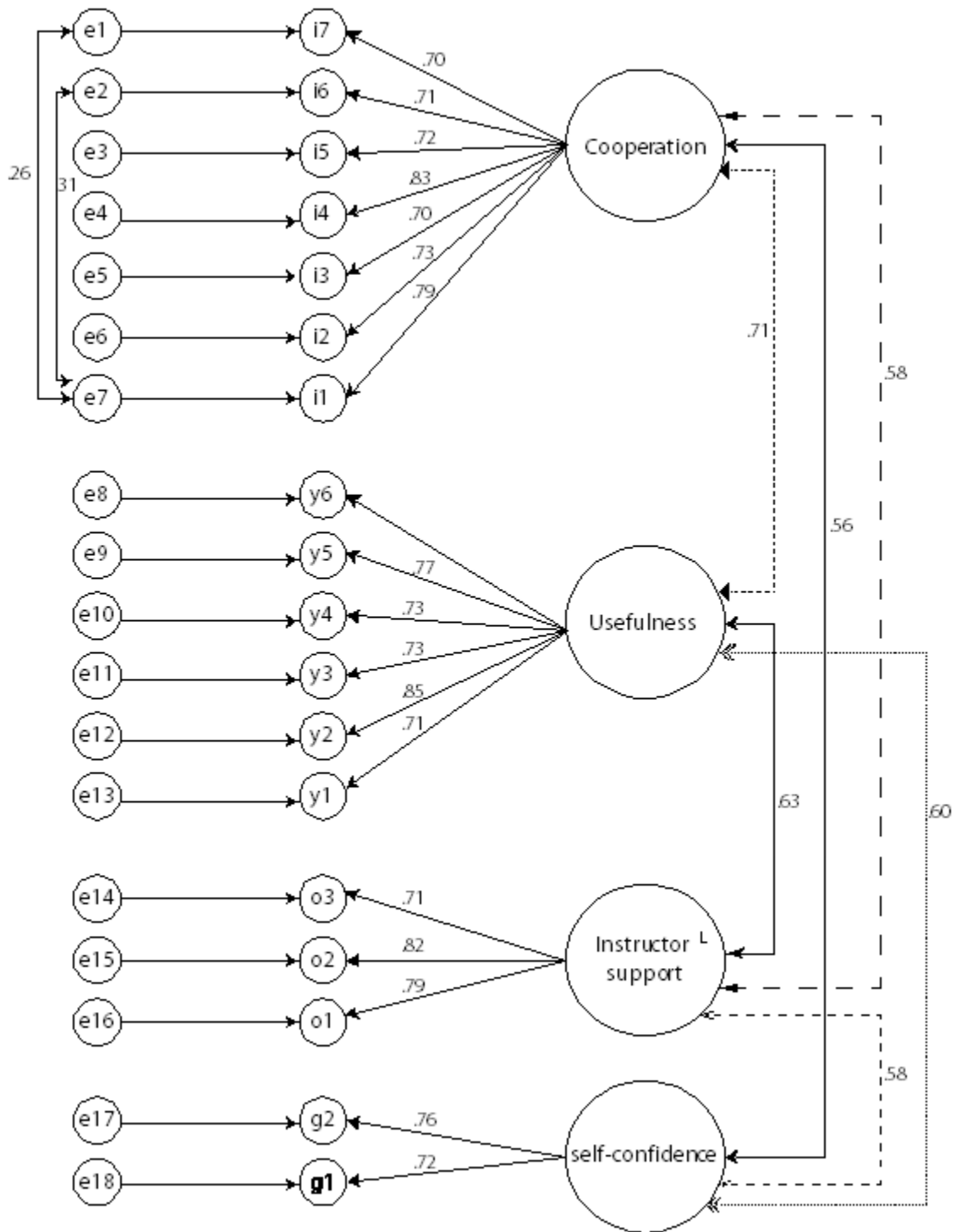


Figure 2. Standardized analysis values regarding the confirmatory factor analysis for EAS

In order to calculate the discrimination capacity of each item in the scale, the scores received by the bottom and top 27% groups were analyzed. Table 5 presents the findings obtained as a result of the t-test conducted.

Table 5. Item discrimination capacity (t values)

Factors							
Cooperation		Usefulness		Instructor Support		Self-Confidence	
Item	t value	Item	t value	Item	t value	Item	t value
I1	4,705	I8	5,946	I14	4,243	I17	7,647
I2	4,372	I9	6,805	I15	7,092	I18	6,647
I3	6,113	I10	5,857	I16	6,650		
I4	6,838	I11	5,571				
I5	9,664	I12	5,233				
I6	6,069	I13	7,548				
I7	6,871						

*p<,001

When the results presented in Table 5 were examined, it was seen that the t values, which referred to the discrimination capacity of items obtained as a result of t-test ranged between 4,243 and 7,647, and these t values were found significant ($p<.001$). Accordingly, it could be stated that each item in the scale had a discrimination capacity and that the scale had a high level of validity.

In order to determine the internal consistency of the scale, split-half, Cronbach's Alpha and Spearman-Brown tests were conducted. Table 6 presents the results obtained via these tests.

Table 6. Reliability analyses regarding the scale and its sub-factors

	Cooperation	Usefulness	Instructor Support	Self-Confidence	Total
Cronbach's Alpha	,821	,732	,728	,639	,868
Spearman Brown	,817	,700	,749	,639	,859
Guttman Split-Half	,788	,700	,695	,639	,859

According the results presented Table 6, the Cronbach's Alpha value was calculated as ,821; Spearman Brown value as ,817; Guttman Split-Half value was calculated as ,788. Taking these results into consideration, it could be stated that the internal consistency of both the scale as a whole and its sub-factors was at an acceptable level.

In order to interpret the consistency of the scale, the test-retest method was applied. For this purpose, the scale was applied to the participants about three weeks after the first application to see the correlation between the scores obtained in the former and in the latter applications of the scale. The correlation between the two applications was calculated as ,892 ($N=29$, $p<0,05$). This value shows that the scale was consistent over time.

CONCLUSION, DISCUSSION AND SUGGESTIONS

In the present study, a scale was developed to determine students' attitudes towards Edmodo, a SLN, EAS was a five-point Likert-type scale made up of 4 factors and 18 items. Each item in the scale was rated as 1. I Completely Agree, 2. I Agree, 3. I am Neutral, 4. I Disagree and 5. I Completely Disagree. Using the data obtained via the draft form of the scale, the validity and reliability studies were conducted.

The results of the exploratory factor analysis conducted to determine the factors in the scale revealed that EAS included four. Taking the factor loads of the items in the factors of EAS, the eigenvalues of the factors, and the explained variance rates into account, the scale could be

said to have a valid structure. In the study, confirmatory factor analysis was conducted to confirm the factor structures of EAS, which was found to include four factors with the help of exploratory factor analysis. Depending on the goodness of fit values obtained via CFA, EAS could be regarded as a scale with four dimensions.

In the study, the item-total correlations were calculated, and the extent to which each item measures the related factor and the features. The results revealed that each item in EAS was able to measure the features intended to be measured. In addition, in the study, with the help of the bottom and top 27% group scores, the item discrimination index was calculated. Accordingly, it was found that each item in EAS satisfactorily had a discrimination capacity. Since there is no scale similar to EAS in terms of content or purpose in related literature, it was not possible to calculate the validity for similar scales. In this respect, the scale was concluded to be fairly reliable using the split-half, Cronbach's Alpha and Spearman-Brown tests.

Considering the increasing importance of cooperative learning in online learning environments (Durak, 2016) and the increasing number of users in social network platforms (Durak, 2016b; Çankaya, Durak & Yunkul, 2014), determining learners' attitudes towards Social Learning Networks (SLNs) is important for the success of instructional activities carried out in these environments. In experimental studies to be conducted via SLNs, use of the present scale will allow not only examining the attitudes but also investigating the relationships between success and attitude. In addition, EAS can also be used as a preattitude and postattitude tool in an experimental design. Consequently, EAS, which can be used in instructional and research activities to be carried out via Edmodo could be said to be a valid and reliable scale. In literature, there is no scale developed to determine learners' attitudes via SLNs. In this respect, EAS is thought to contribute to the field. In future studies to be conducted to investigate the influence of the scale on different groups, the related validity and reliability studies could be carried out.

BIODATA and CONTACT ADDRESSES of AUTHORS



Dr. Eyup YUNKUL is a Research Assistant at Necatibey Faculty of Education, Balıkesir University. Dr. YUNKUL received M.S degree in Computer Education & Instructional Technology Department at Balıkesir University. He gained his Ph.D. in Educational Curriculum and Instruction at February, 2014. His academic interest areas are educational social network, educational multimedia, open and distance learning, online learning and use of internet in education. He has journal articles published in international indexes, papers submitted to international meetings.

Dr. Eyup YUNKUL
Computer Education & Instructional Technology
Necatibey Faculty of Education
Balıkesir University, 10100, Balıkesir, Turkey
Phone: +90 266 241 27 62
E-mail: eyunkul@balikesir.edu.tr



Dr. Serkan CANKAYA is a Research Assistant at Necatibey Faculty of Education, Balıkesir University. Dr. CANKAYA received M.S degree in Computer Education & Instructional Technology Department at Balıkesir University. He gained his Ph.D. in Computer Education & Instructional Technology Department at Anadolu University at June, 2013. His academic interest areas are social learning networks, educational multimedia, open and distance learning, online learning and special educational technology. He has journal articles published in international indexes, papers submitted to international meetings.

Dr. Serkan CANKAYA
Computer Education & Instructional Technology
Necatibey Faculty of Education
Balıkesir University, 10100, Balıkesir, Turkey
Phone: +90 266 241 27 62
E-mail: serkancankaya@balikesir.edu.tr

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Appendix 1. Original Scale Factors and Items in Turkish

Faktör 1: İşbirliği

- I1. Edmodo ile yürütülen derslerde paylaşımda bulunmaktan hoşlanırım.
- I2. Edmodo ile yaptığım paylaşımların arkadaşlarıma faydalı olduğunu düşünüyorum.
- I3. Edmodo'nun öğrenciler arası iletişime katkıda bulunduğunu düşünüyorum
- I4. Edmodo üzerinden gruptaki arkadaşlarımla paylaşımlarının öğrenmeye katkıda bulunduğunu düşünüyorum.
- I5. Edmodo ile yürütülen derslerde yapılan paylaşımları takip etmekten hoşlanırım.
- I6. Edmodo üzerinden sınıf arkadaşlarımla kolaylıkla yardımlaşabilirim.
- I7. Edmodo ile yürütülen bir dersin grup çalışmalarını olumsuz etkilediğini düşünüyorum.

Faktör2: İşe Yararlık

- I8. Facebook gibi siteler varken Edmodo'ya gerek olmadığını düşünüyorum.
- I9. Edmodo'nun eğitim için faydalı yenilikçi teknolojilerden olduğunu düşünüyorum.
- I10. Dersi, Edmodo üzerinden takip etmenin sıkıcı olduğunu düşünüyorum.
- I11. Edmodo'nun, Facebook'da olduğu gibi ilgisiz ve gereksiz içerik barındırmadığından dikkat dağınık olmadığını düşünüyorum.
- I12. Edmodo'nun derse olan güdülenmemi (motivasyonumu) arttırdığını düşünüyorum.
- I13. Edmodo'nun kaynak ve materyallere erişim açısından zenginlik sağladığını düşünüyorum.

Faktör 3: Öğretici Desteği

- I14. Edmodo ile yürütülen bir deste öğretim elemanının öğrencilerin sorularına daha hızlı dönüt verebileceğini düşünüyorum.
- I15. Edmodo ile yürütülen bir derste öğretim elemanı ile rahatlıkla iletişim kurulabileceğini düşünüyorum.
- I16. ESAS'ların öğrenciler ve öğretmen arasındaki iletişime katkıda bulunduğunu düşünüyorum.

Faktör 4: Özgüven

- I17. Edmodo ile yürütülen bir derste daha katılımcı olduğumu hissedirim.
- I18. Edmodo ile yürütülen bir derste düşüncelerimi daha özgürce ifade edebildiğimi düşünüyorum