Developing a Scale for Constructivist Learning Environment Management Skills*

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Abstract

Problem Statement: The success of creating a constructivist learning environment is directly related to teachers' management abilities and therefore scales that evaluate those skills are essential to the process. Given the importance of this subject, the development of scales that address all aspects of the constructivist learning environment should be an assessment priority.

Purpose of the Study: The purpose of this study is to develop a scale that will determine elementary and high school teachers' management skills within the constructivist learning environment.

Methods: The study was conducted on three different study groups composed of teachers working in elementary and high schools located in the city center of Şanlıurfa, Turkey. The groups were determined by the random sampling method. A draft scale composed of 47 items was compiled for use in this study. Exploratory factor analysis (EFA) was applied to evaluate the factor structure of the scale. Item analysis was used to evaluate the consistency of each item within the entire scale and the distinctive quality of each item. Confirmatory factor analysis (CFA) was applied to assess whether the factors obtained as a result of EFA were confirmed or not. The reliability of the scale was calculated by Cronbach's alpha coefficient for internal consistency and test-retest methods.

Findings and Results: As a result of EFA, a six-factored structure composed of 33 items, which have factor load values of .49 and above was finalized. Item analysis affirmed that each item was consistent with the entire scale and the distinctive powers of the items were at an acceptable level. CFA

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* Although the concept of constructivist learning environment management is also used to mean constructivist learning environment leadership, in this study, only the term constructivist learning environment management will be used. Therefore, the scale could also be named as the Scale for Constructivist Learning Environment Leadership Skills (SCLELS).
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indicated that the fit indexes had values significantly above acceptable values, which confirmed the 6-factored structure. The scale's internal consistency coefficient, which was .95, indicated high reliability.

Conclusions and Recommendations: The study results showed that this scale was an appropriate instrument to evaluate teachers' management skills within the constructivist learning environment in elementary and high schools in Turkey. A version of this scale for students can be developed to collect more detailed information about the constructivist learning environment management skills of teachers.

Keywords: Constructivism, constructivist leadership, constructivist learning environment, learning environment management, scale development

Constructivism is a contemporary theoretical approach that has recently influenced educational systems world-wide. The constructivist approach to learning was first introduced to education in England in 1989 (Pon, 2001) and became especially popular in the 2000s (Şişman, 2010). Constructivism in education is now implemented in more than 30 countries (Güneş, 2007) including the U.S., New Zealand (Matthews, 2000; Yaşar, 2005), Taiwan (Aldridge, Fraser, Taylor, & Chen, 2000; Pon, 2001), Spain, Canada (Matthews, 2000) and Turkey.

Constructivism is a learning approach that encourages the learner to construct knowledge (Brooks & Brooks, 1999; Fosnot, 2005; Henson, 2003; Koç & Demirel, 2004; Özden, 2005; Perkins, 1999). In other words, it is an educational approach that centers on the learner so that information is given meaning and structure through the establishment of a relationship between past experiences and the new information (Asan & Güneş, 2000; Şaşan, 2002; Şimşek, 2004; Tynjälä, 1999; Vermette & Foote, 2001). The constructivist approach to education has been related to teaching, cognition and information, as well as the learning process (Matthews, 2000). This is why the task of teachers who implement this approach is to create an environment and opportunities that encourage students to create meaning and construct knowledge (Brooks & Brooks, 1999, 1999a; von Glasersfeld, 1995, 2005).

A constructivist learning environment is very different from the classroom environment where traditional teaching methods are implemented (DeVries & Zan, 2005; Kaya & Tüfekçi, 2008; Yıldırım, 2009). The concept of a "learning environment" is widely used instead of the word "classroom" since the learning activity is realized both in and out of the classroom. Students' skills on a variety of levels are developed and honed within this educational environment (Güneş, 2007). Active, rather than passive, learning methods are at the core of the constructivist learning environment (Açıkgöz, 2003; Loyens & Gijbels, 2008; Yaşar, 1998). Active learning requires that students take on more responsibility for their own learning process (Saban, 2000; Schunk, 2008; Shapiro, 2002; Yager, 1991). However, teachers still need to actively manage this environment (DeVries & Zan, 2005). It is widely accepted that the

quality of education depends largely on the quality of classroom management (Başar, 1999). In a constructivist learning environment, the role of the teacher is to support students' learning process by organizing student-oriented activities (Brandon & All, 2010; Brooks & Brooks, 1999a; Yıldırım & Dönmez, 2008). It can be said that the success of such implementations in this environment is directly linked to teachers' management skills and determining the level of these skills requires development of appropriate scales.

There have been some studies regarding the development of a scale for measuring the constructivist learning environment. To assess the constructivist learning environment, Taylor and Fraser (1991) developed the Constructivist Learning Environment Survey (CLES). It consists of four dimensions: negotiation, prior knowledge, autonomy, and student centeredness. Studies have also been conducted to redevelop and update this scale (e.g., Aldridge et al., 2000; Taylor, Fraser, & Fisher, 1997). The updated version of this scale, which was prepared by Aldridge et al. (2000), was adapted into Turkish culture by Bukova-Güzel and Alkan (2005). Tenenbaum, Naidu, Jegede, and Austin (2001) devised another constructivist learning environment scale. This scale has seven dimensions: arguments, discussions, debates; conceptual conflicts and dilemmas; sharing ideas with others; materials and resources targeted toward solutions; motivation toward reflections and concept investigation; meeting students' needs; making meaning, and real-life examples. This scale was similarly adapted into Turkish culture, by Fer and Cırık (2006). Arkün and Aşkar (2010) developed yet another scale that aims to assess the constructivist learning environment through the opinions of university students. This scale has six dimensions: student centered, encouraging the student to think, cooperation, life-related, combination of teaching and assessment, and different points of view. Different scale development studies have also been conducted regarding the constructivist learning approach. For example, Karadağ (2007) developed a scale titled, "teacher efficiency in constructivist learning" by ascertaining the opinions of students of education faculty. This scale consisted of four dimensions: students, planning the instruction, the instruction process, and assessment and evaluation.

According to the literature, the developed scales are generally related to the constructivist learning approach or constructivist learning environment. These scales have been developed primarily to determine to what extent the constructivist learning approach is applied within the learning environment or the suitability of the specific learning environment to a constructivist learning approach (e.g., Aldridge et al., 2000; Arkün & Aşkar, 2010; Balım, Kesercioğlu, Evrekli, & İnel, 2009; Karadağ, 2007; Kaya, 2008; Taylor & Fraser, 1991; Tenenbaum et al., 2001). However, the present author has not encountered a scale for "teachers' constructivist learning environment management skills" that involves classroom management phases based on teachers' opinions. According to Başar (1999), learning environment or classroom management includes physical structure, plan-curriculum, time management, relationship management, and behavioral management. Management of the constructivist learning environment is also composed of many dimensions (Güneş, 2007; Yıldırım & Dönmez, 2008), so a need has emerged to develop a scale that covers

these dimensions. This is why the developing of "the Scale for Constructivist Learning Environment Management Skills (SCLEMS)" offers a useful contribution to the field. The purpose of this study is to develop a scale that can be used to determine the constructivist learning environment management skills of elementary and high school teachers.

Method

The current study aimed to develop a " Scale for Constructivist Learning Environment Management Skills (SCLEMS).

Research Sample

The study was conducted on three different study groups. EFA was applied on the first group. This group consisted of 316 teachers who were chosen by a random sampling method among teachers working in the city center of Şanlıurfa during the 2010-2011 academic year. Of these teachers 186 (59%) were male and 130 (41%) were female. The number of participants working in elementary schools was 212 (67%) while 104 (33%) worked in high schools.

CFA was applied on the second study group. This group consisted of 317 teachers chosen by a random sampling method among teachers working in the city center of Şanlıurfa during the 2010-2011 academic year. Of these teachers 167 (53%) were male and 150 (47%) were female. The number of participants working in elementary schools was 209 (66%) while 108 (34%) worked in high schools.

The third study group was selected for a reliability analysis of the test-retest. This group consisted of 50 teachers who worked in an elementary school located in the city center of Şanlıurfa during the 2010-2011 academic year. Of these teachers 26 (52%) were male and 24 (48%) were female. The final version of the scale was applied on this study group twice at a four-week interval.

Research Instrument and Procedure

The following procedures were performed in order to develop the draft scale: *(i)* Studies and scales concerning the constructivist learning environment were examined (Aldridge et al., 2000; Aydın, 2007; Brooks & Brooks, 1999; Fosnot, 2005a; Güneş, 2007; Karadağ & Korkmaz, 2007; Kaya, 2008; Lambert, et al., 2002; Özden, 2005; Tenenbaum et al., 2001; Yıldırım, 2009; Yıldırım & Dönmez, 2008). *(ii)* Interviews were conducted with three teachers and two education supervisors regarding teachers' management skills within the constructivist learning environment. *(iii)* Then a draft scale was developed with 44 items, which was consistent with a 5-point Likert type (Never, Rarely, Sometimes, Mostly, Always). Constructivist learning environment management processes were taken into account while determining the items in the draft scale. These processes consisted of such activities as organizing the learning environment, teaching and learning, communication and interaction, time usage, assessment (Güneş, 2007; Yıldırım & Dönmez, 2008), and improving skills (Güneş, 2007; Yıldırım, 2009). *(iv)* One expert from the Turkish Language and Literature Department and one expert from the statistics field were asked their opinions on the conformity of items for the draft scale in terms of language and expression. The opinions of an education supervisor, four experts from the educational administration and supervision field, and the opinions

of two lecturers from the educational programs field were consulted for the content validity of the items (Tavşancıl, 2010). Expert opinions revealed that three items in the draft scale were appropriate for measuring two different skills each. The number of items then rose to 47 as these three items were rewritten as six separate items. *(v)* The content validity ratio (CVR) of each item was analyzed using Lawshe's technique based on the expert opinions. In the analysis, it was found that all the items in the draft scale fulfilled the .99 minimum standard of the CVR values (Lawshe, 1975). Accordingly, all the items were included in the draft scale form.

Data Analysis

The data were analyzed using SPSS and LISREL. *(i)* EFA was applied in order to evaluate the structural validity and factor structure of the scale. The consistency of the data with EFA was determined by using Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. Principal Component Analysis was performed for EFA using the Varimax rotation technique. In determining the factor number, the criterion was a minimum Eigen value of 1.00 and in choosing the items, the criterion was a minimum factor load of .32 (Çokluk, Şekercioğlu, & Büyüköztürk, 2010; Tabachnick & Fidel, 2007). *(ii)* Item analysis was conducted for the first study group data. Initially, corrected item total correlations were examined in order to evaluate the consistency of each item with the entire scale. Then, the distinctive power of the items was examined by the independent samples *t*-test. For this equation, an item analysis technique based on the upper-lower 27% group averages difference was used (Büyüköztürk, 2003; Tavşancıl, 2010). Data was first checked to see whether it met *t*-test requirements and was found to meet them. *(iii)* CFA was used to assess whether the factors obtained as a result of EFA were confirmed or not. The criteria for assessing the conformity of the model defined are as follows (Bayram, 2010; Çokluk et al., 2010; Kline, 2005; Tabachnick & Fidel, 2007): the ratio of Chi-Square value to Degree of Freedom (χ^2/df) should be below 2, the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) should be below .05, Adjusted Goodness of Fit Index (AGFI) should be above .85, and the Comparative Fit Index (CFI) and Non-Normed Fit Index (NNFI) should be above .90. *(iv)* The scale's reliability was calculated by Cronbach's alpha coefficient for internal consistency and test-retest reliability methods (Altunışık, Coşkun, Bayraktaroğlu, &Yıldırım, 2005; Büyüköztürk, 2003; Tavşancıl, 2010).

Results

Validity of the SCLEMS

EFA results. The KMO value was found to be .93 and the result of the Bartlett's test of sphericity was significant (χ^2=4349.14; df=528; *p*<.001). Accordingly, it was concluded that the data were perfectly sufficient to apply EFA (Tavşancıl, 2010). The anti-image correlation matrix was examined in order to evaluate whether there were variables with a spoiling effect on EFA. All the variables were believed to contribute to the total solution as the diagonal values in this matrix were between .83 and .96 (Altunışık et al., 2005). In EFA, it was evident that 47 items were divided into nine factors and the difference between the factor load values that 14 items obtained in two different factors analysis was below .01. After excluding the aforementioned items, EFA was conducted again on the remaining items (Büyüköztürk, 2003).

Accordingly, a six-factored structure consisting of 33 items was finalized. The items matching the factors were given names after examining their contents. The factors were given the following names: communication and interaction (CI), relation establishment (RE), skills development (SD), time usage and assessment (TUA), learning and teaching (LT) and learning environment organization (LEO). The factor analysis results of the SCLEMS are presented in Table 1.

Table 1

Factor Analysis Results of The SCLEMS

Factor name	Scale item no	Item no	Weight Values after Rotation					
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
CI	1	I–22	**.72**	.10	.12	.09	.16	.17
	2	I–23	**.68**	.14	.09	.16	.23	.06
	3	I–18	**.67**	.11	.26	.21	-.05	.12
	4	I–17	**.65**	.03	.28	.18	.20	.04
	5	I–21	**.65**	.25	.16	.11	.15	.02
	6	I–19	**.56**	.27	.30	.17	.09	.00
	7	I–24	**.54**	.28	.00	.18	.24	.24
	8	I–16	**.53**	.25	.31	.12	-.03	.18
RE	9	I–33	.13	**.69**	.19	.06	.21	.06
	10	I–32	.17	**.65**	.18	.21	.03	.24
	11	I–34	.23	**.62**	.06	.13	.15	.13
	12	I–36	.20	**.59**	.19	.25	.33	.07
	13	I–35	.28	**.53**	.16	.21	.28	.02
SD	14	I–9	.16	.22	**.71**	.11	.22	.05
	15	I–10	.15	.19	**.66**	.20	.07	.15
	16	I–11	.30	.18	**.65**	.16	-.01	.10
	17	I–8	.27	.14	**.63**	.23	.14	.10
	18	I–7	.29	-.07	**.51**	.30	.20	.25
TUA	19	I–28	.26	.04	.25	**.68**	.18	-.07
	20	I–26	.24	.18	.15	**.60**	.30	.06
	21	I–27	.23	.23	.26	**.60**	.26	-.06
	22	I–30	.07	.26	.16	**.55**	.16	.33
	23	I–31	.25	.35	.14	**.53**	-.00	.24
	24	I–29	.35	.23	.13	**.49**	.23	.14
LT	25	I–44	.21	.02	.04	.11	**.65**	.07
	26	I–46	.01	.28	.22	.22	**.63**	.13
	27	I–45	.20	.29	.19	.17	**.59**	.01

Table 1 continuee...

Factor name	Scale item no	Item no	Weight Values after Rotation					
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
	28	I–47	.10	.35	.18	.30	**.58**	.19
	29	I–43	.28	.25	-.00	.18	**.51**	.31
LEO	30	I–5	.13	.18	-.00	.16	-.08	**.71**
	31	I–3	.10	.08	.31	-.12	.27	**.64**
	32	I–4	.14	.18	.07	.31	.16	**.59**
	33	I–2	.13	-.05	.33	-.14	.24	**.50**
Eigenvalue			11.30	1.86	1.56	1.34	1.15	1.07
% of Variance			34.23	5.65	4.74	4.05	3.50	3.25
Cronbach's	Alpha	.86	.79	.81	.82	.79	.65

Cumulative explained variance: 55.40 %
Cumulative reliability coefficient of the scale Cronbach Alpha: .94

CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

Upon examination Table 1 shows that factor Eigenvalues were 1.07 and above and the items had factor load values between .49 and .72. It was found that the SCLEMS explained 55.40% of the total variance and this value was acceptable (Altunışık et al., 2005; Büyüköztürk, 2003; Tavşancıl, 2010). The first factor explains 34.23% of the total variance of the scale; the second factor explains 5.65%; the third factor explains 4.74%; the fourth factor explains 4.05%; the fifth factor explains 3.50%; and the sixth factor explains 3.25%. Table 2 gives the factor correlation coefficients with each other and with the total score.

Table 2

Correlation Coefficients Among the SCLEMS Factors

Factor	SCLEMS	CI	RE	SD	TUA	LT
CI	.83**	-				
RE	.80**	.57**	-			
SD	.79**	.62**	.52**	-		
TUA	.85**	.64**	.65**	.62**	-	
LT	.78**	.54**	.63**	.51**	.64**	-
LEO	.66**	.42**	.43**	.47**	.42**	.45**

**p<.01; CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

As can be seen in Table 2, there is a significant relationship among the factors, and between the factors and the total score. There is a relationship at an average level between the total score and the LEO factor; and there is a high significant relationship between the total score and other factors. It is also evident that the SCLEMS factors have an average relationship with each other (Büyüköztürk, 2003). The fact that this relationship is not at a very high level shows that the scale is convenient for a multiple-factored structure (Kline, 2005).

Item analysis. An item analysis was conducted based on the corrected item total correlation and difference of the lower-upper 27% group means. The results of the analysis are given in Table 3. When Table 3 is examined, it is seen that the corrected item total correlation coefficients varied between .33 and .64 and these coefficients were high above the minimum .25 criterion. These coefficients show that each item is consistent with the entire scale and this result provides evidence for the structural validity of the scale (Tavşancıl, 2010). In the item analysis based on the difference of lower-upper 27% group means, *t* values are significant (*p*<.001). Accordingly, it is understood that all the items distinguish teachers according to their constructivist learning environment management skills (Büyüköztürk, 2003; Tavşancıl, 2010).
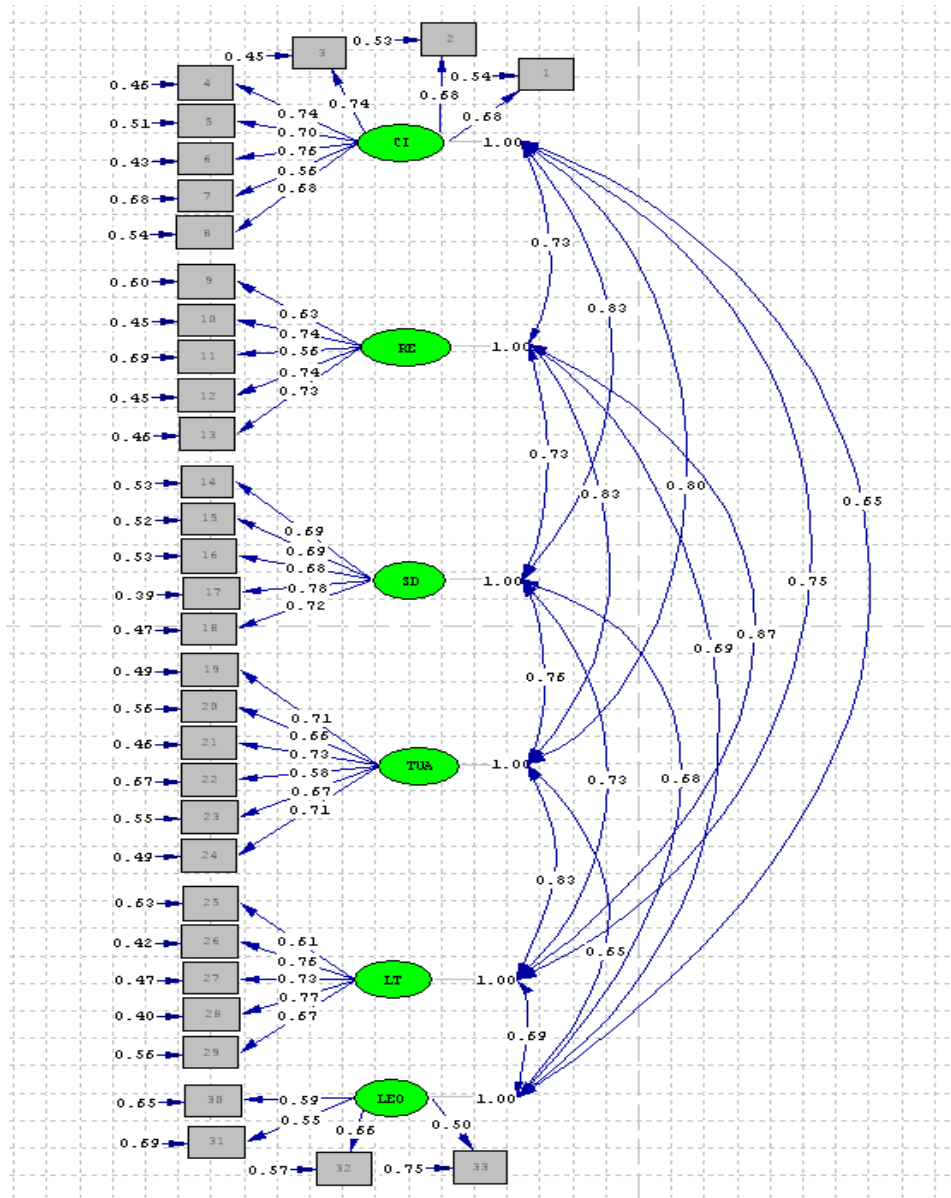
Table 3

Corrected Item-Total Correlations and t Values for the Difference of Lower-Upper 27% of the Items

Item no	*t* (n=86)	r (n=316)	Item no	r (n=316)	*t* (n=86)	Item no	*t* (n=86)	r (n=316)
2	6.81***	.33	18	.56	12.22***	31	14.66***	.58
3	8.36***	.43	19	.58	13.11***	32	12.29***	.56
4	8.95***	.50	21	.56	11.58***	33	10.79***	.51
5	6.78***	.36	22	.57	13.73***	34	10.33***	.52
7	11.16***	.56	23	.57	12.89***	35	12.76***	.59
8	11.74***	.60	24	.56	12.15***	36	15.62***	.60
9	10.90***	.57	26	.59	12.94***	43	11.66***	.57
10	10.72***	.54	27	.61	12.58***	44	8.29***	.41
11	11.49***	.55	28	.54	11.13***	45	11.82***	.56
16	13.11***	.56	29	.62	13.86***	46	11.04***	.54
17	10.75***	.58	30	.55	10.32***	47	13.81***	.64

*** *p*<.001

CFA results. The model for the six-factored structure, which was determined by EFA, was tested with CFA. As a result of CFA, conformity indexes were found to be χ^2=707.45 (df=480, *p*<.001), χ^2/df=1.47, RMSEA=.039, SRMR=.042, AGFI=.86, CFI=.95, NNFI=.94. These values are well above the acceptable values, showing that the six-factored structure of the scale is confirmed. Then, *t* values for the factors' status that explains each item were examined and it was seen that these values were significant (*p*<.01). Standardized analysis coefficients for factor-item relations calculated with CFA are presented in Figure 1. Upon examining Figure 1, it was concluded that the coefficients for the factors' direct effect on the items varied between .50 and .78; and the variance coefficients, which could not be explained, varied between.39 and .75. The observed factor-item relationships were found to be significant (*p*<.01).

CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

Figure 1. *CFA Results for SCLEMS*

Reliability of the SCLEMS

The reliability of the SCLEMS was calculated by Cronbach's alpha coefficient for internal consistency and test-retest reliability methods. Results concerning the reliability of the SCLEMS are presented in Table 4. When the results in Table 4 are examined, it is evident that the factors' internal consistency coefficients obtained values between .67 and .88 and the internal consistency coefficient for the entire scale was .95. These coefficients show that the scale has a high internal consistency. It was found that the factors' test-retest reliability coefficients obtained values between .71 and .79; and the test-retest reliability coefficient for the entire scale was .93. These coefficients show that with this scale, consistent time-dependent measurements at a reliable level can be performed.

Table 4

Internal Consistency and Test-Retest Reliability Coefficients of the SCLEMS

Factor	Cronbach's Alpha Coefficient (n=317)	Test-retest Reliability (n=50)
CI	.88	.76
RE	.81	.74
SD	.84	.79
TUA	.84	.72
LT	.83	.77
LEO	.67	.71
Total	.95	.93

CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

Discussion and Conclusion

In the present study, analyses were made for the reliability and validity of the SCLEMS, which was developed in order to evaluate the constructivist learning environment management skills of elementary and high school teachers. In the calculation, the CVR values for the scale items were found to be above .99, showing that the content validity of the SCLEMS was very good. The KMO value was found to be .93; the result of the Bartlett's test for sphericity was significant and the anti-image correlation matrix diagonal values were above .83, showing that these data were sufficient to conduct EFA (Altunışık et al., 2005). As a result of the Varimax rotation in EFA, a six-factored structure that explains 55.40% of the total variance, whose item factor loads are .49 and above, and whose Eigen values are 1.07 and above, was obtained. The Varimax rotation produced values that were high above

the minimum criterion, which supports the content validity of the scale. In the literature, although no scale studies directly similar to this scale were found, there are many scale studies concerning the constructivist learning environment that have similar results to those of this study. Furthermore, these scales are seen to have a multiple-factored structure (Aldrige et al., 2000; Arkün & Aşkar, 2010; Kaya, 2009; Taylor & Fraser, 1991; Tenenbaum et al., 2001). For example, the scales developed by Taylor and Fraser (1991), Arkün and Aşkar (2010) had four factors; and the scale developed by Tenenbaum et al. (2001) had seven factors. These scale studies support the current scale structure used in the present study. As the items in the SCLEMS were created by taking classroom management processes into account, the number of factors and factor names are not entirely consistent with the other scales. The relationship coefficients among the SCLEMS factors were found to be between .42 and .65 and these values are not very high, which supports the multiple-factored structure of this scale (Kline, 2005). In the item analysis, the corrected item-total correlation coefficients were found to be .33 and above; and result of the independent samples *t*-test based on the difference of lower-upper 27% group means was found to be significant for all the items, which illustrates that the distinctive power and structural validity of the SCLEMS are very good (Tavşancıl, 2010). It was revealed that the conformity indexes obtained as a result of CFA were good; and the factor-item relationships, which were observed, were significant. These results confirm the six-factored structure of the scale obtained by EFA.

As a result of Cronbach's alpha coefficient analysis for internal consistency, the reliability coefficient for the entire scale was found to be .95; and the reliability coefficients of the factors were found to be .67 and above. As a result of the test-retest reliability analysis, it was determined that the reliability coefficient for the entire scale was .93; and the factor reliability coefficients were .71 and above. The reliability results of the scale showed that the scale had a high level of internal consistency and consistent time-dependent measurements at a reliable level can be performed with this scale (Tavşancıl, 2010).

Validity and reliability results showed that the SCLEMS was a convenient assessment instrument in terms of validity and reliability. It is thought that this scale is convenient for measuring the constructivist learning environment management skills of elementary and high school teachers in Turkey. A version of the SCLEMS for students may be developed to collect more detailed information about the constructivist learning environment management skills of teachers.

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Yapılandırmacı Öğrenme Ortamını Yönetme Becerileri Ölçeğinin Geliştirilmesi[***]

Atıf:

Suggested Citation:

Özet

Problem Durumu: Son yıllarda sıkça tartışılan yaklaşımlardan biri yapılandırmacılıktır. Bu yaklaşımı uygulayan öğretmenlerin temel görevi, öğrenenlerin bilgiyi anlamlandırmasına ve yapılandırmasına teşvik edecek ortam ve olanaklar sağlamaktır. Yapılandırmacı öğrenme ortamları, geleneksel yöntemlerin uygulandığı sınıf ortamlarından oldukça farklıdır. Yapılandırmacı öğrenme ortamlarında öğrencilerin daha fazla sorumluluk almaları ve aktif olmaları gerekmektedir. Öğretmenlerin ise bu ortamın yönetimi konusunda aktif olmaları beklenmektedir. Yapılandırmacı öğrenme ortamındaki uygulamaların başarıya ulaşmasının, öğretmenlerin bu ortamı yönetme becerileriyle doğrudan ilişkilidir. Öğretmenlerin bu ortamı yönetme becerilerinin ne düzeyde olduğunun belirlenebilmesi ise sözü edilen becerileri belirlemede kullanılabilecek ölçme araçlarının geliştirilmesini gerektirmektedir. Yapılandırmacı öğrenme ortamı ile ilgili bazı ölçek geliştirme çalışmaları yapılmıştır. Fakat alanyazında öğretmenlerin görüşlerine dayalı, öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerine yönelik ve sınıf yönetimi süreçlerini kapsayan herhangi bir ölçeğe rastlanmamıştır. Bu nedenle, böyle bir ölçek geliştirme çalışmasına ihtiyaç duyulmuştur.

[***] "Yapılandırmacı öğrenme ortamını yönetme" kavramı, yapılandırmacı öğrenme ortamı liderliği anlamında da kullanılmaktadır. Bu çalışmada, yapılandırmacı öğrenme ortamını yönetme kavramı tercih edilmiştir. Dolayısıyla, Yapılandırmacı Öğrenme Ortamını Yönetme Becerileri Ölçeği (YÖOYB), Yapılandırmacı Öğrenme Ortamı Liderliği Becerileri Ölçeği (YÖOLBÖ) şeklinde de adlandırılabilir.

Araştırmanın Amacı: Bu araştırmanın amacı, ilköğretim okullarında ve liselerde görev yapan öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerinin ne düzeyde olduğunu belirlemeye yönelik bir ölçek geliştirmektir.

Araştırmanın Yöntemi: Araştırma, Şanlıurfa il merkezindeki ilköğretim okullarında ve liselerde görev yapan ve tesadüfi örnekleme yöntemiyle belirlenen öğretmenlerden oluşan üç farklı çalışma grubu üzerinde gerçekleştirilmiştir. Birinci çalışma grubu, 316 öğretmenden; ikinci çalışma grubu 317 öğretmenden, üçüncü çalışma grubu ise bir ilköğretim okulunun 50 öğretmeninden oluşmuştur. Alanyazın incelemesinden ve kapsam geçerliğine yönelik uzman görüşleri alındıktan sonra 47 maddelik taslak bir ölçek oluşturulmuştur. Ölçeğin yapı geçerliğini ve faktör yapısını belirlemek için birinci çalışma grubu verileri üzerinde Açımlayıcı Faktör Analizi (AFA) uygulanmıştır. Verilerin AFA'ya uygunluğu Kaiser-Meyer-Olkin (KMO) ve Bartlett küresellik testleriyle belirlenmiştir. Faktör sayısının belirlenmesinde ölçüt olarak, Eigen değerinin minimum 1.00 olması ve maddelerin seçiminde ise madde faktör yüklerinin minimum. 32 olması temel alınmıştır. AFA'dan sonra madde analizi yapılmıştır. Her bir maddenin ölçeğin bütünü ile tutarlığını belirlemek için düzeltilmiş madde toplam korelasyonları incelenmiştir. Maddelerin ayırt edicilik gücü ise ilişkisiz örneklemler için *t* testi ile belirlenmiştir. AFA'da elde edilen faktörlerin doğrulanıp doğrulanmadığına ilişkin değerlendirmenin yapılabilmesi için ikinci çalışma grubu verileri üzerinde Doğrulayıcı Faktör Analizi (DFA) yapılmıştır. DFA'da tanımlanan modelin uyumunu değerlendirmede; χ^2 değerinin serbestlik derecesine oranının ikiden küçük, RMSEA ve SRMR değerlerinin .05'ten küçük, AGFI değerinin .85'ten büyük, CFI ve NNFI değerlerinin .90'ten büyük olması ölçüt olarak kabul edilmiştir. Ölçeğin güvenirliğini belirlemek için ikinci çalışma grubu verileri üzerinde Cronbach alfa katsayısı ve üçüncü çalışma grubu verileri üzerinde ise test-tekrar test güvenirliği katsayısı hesaplanmıştır.

Araştırmanın Bulguları: AFA sonucunda, KMO değeri .93 bulunmuş ve Bartlett küresellik testinin sonucu (χ^2=4349.14; sd=528; *p*<.001) anlamlı çıkmıştır. Bu sonuçlar, verilerin AFA yapmak için mükemmel düzeyde yeterli olduğunu göstermiştir. Madde faktör yükleri .49 ve üzerinde değerler alan 33 maddeden oluşan ve faktör öz değerleri 1.07 ve üzerindeki değerlere sahip altı faktörlü bir yapı ortaya çıkmıştır. Faktörlere; iletişim ve etkileşim (İE), bağlantı kurma (BK), becerileri geliştirme (BG), süre kullanımı ve değerlendirme (SKD), öğrenme ve öğretme (ÖÖ), öğrenme ortamının düzenlenmesi (ÖOD) şeklinde isimler verilmiştir. Yapılandırmacı Öğrenme Ortamını Yönetme Becerileri Ölçeği (YÖOYBÖ)'nin toplam varyansın %55.40'ını açıkladığı ve bu değerin kabul edilebilir düzeyde olduğu anlaşılmıştır. Birinci faktör ölçeğe ilişkin toplam varyansın % 34.23'ünü, ikinci faktör %5.65'ini, üçüncü faktör %4.74'ünü, dördüncü faktör %4.05'ini, beşinci faktör %3.50'sını ve altıncı faktör %3.25'ini açıklamaktadır. Korelasyon analizinde, hem faktörler arasında hem de faktörler ile toplam puan arasında anlamlı bir ilişkinin olduğu saptanmıştır. Hesaplanan düzeltilmiş-madde toplam korelasyon katsayıları .33 ve üzerinde bulunmuştur. Bu katsayılar, her bir maddenin ölçeğin bütünüyle tutarlı olduğunu göstermektedir. Alt-üst %27 grup ortalamaları farkına dayalı madde analizinde ise *t* değerleri anlamlı (*p*<.001) bulunmuştur. Bu sonuç, tüm maddelerin öğretmenleri

yapılandırmacı öğrenme ortamını yönetme becerileri açısından ayırt ettiğinin bir göstergesi olarak kabul edilmiştir. Altı faktörlü yapıya ait model DFA ile test edilmiştir. DFA ile hesaplanan uyum indeksleri şöyledir: $\chi^2/sd=1.47$, RMSEA=.039, SRMR=.042, AGFI=.86, CFI=.95, NNFI=.94. Uyum indekslerinin kabul edilebilir değerlerin oldukça üzerinde olması, ölçeğin altı faktörlü yapısının doğrulandığını göstermiştir. Ayrıca DFA ile hesaplanan faktör-madde ilişkilerine ait standardize edilmiş çözümleme katsayıları incelenmiştir. Faktörlerin maddeler üzerindeki doğrudan etki katsayıları .50 ve üzerinde, açıklanamayan varyans katsayılarının ise .75' ve altında olduğu belirlenmiştir. Gözlenen tüm faktör-madde ilişkileri anlamlı (p<.01) bulunmuştur. Ölçeğin Cronbach alpha güvenirlik katsayıları, faktörler bazında .67 ve üzerinde, ölçeğin toplamına yönelik ise .95 bulunmuştur. Bu katsayılar, ölçeğin iç tutarlığının yüksek olduğunu göstermektedir. Test-tekrar test güvenirlik analizinde ise faktörlere yönelik güvenirlik katsayılarının .71 ve üzerinde olduğu, ölçeğin toplamı için .93 olduğu saptanmıştır. Bu katsayılar, ölçek üzerinde zamana bağlı olarak iyi derecede kararlı ölçümlerin yapılabileceğine işaret etmektedir.

Araştırmanın Sonuçları ve Öneriler: Geçerlik ve güvenirlik sonuçları, YÖOYBÖ'nün geçerlik ve güvenirlik açısından uygun bir ölçme aracı olduğunu göstermiştir. Bu ölçeğin Türkiye'deki ilköğretim okullarında ve liselerde görev yapan öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerini ölçmeye uygun olduğu düşünülmektedir. Öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerine yönelik daha ayrıntılı veri toplamak için YÖOYBÖ'nün öğrenci formları geliştirilebilir.

Anahtar Sözcükler: Yapılandırmacılık, yapılandırmacı liderlik, yapılandırmacı öğrenme ortamı, öğrenme ortamını yönetme, ölçek geliştirme

APPENDIX

The Scale for Constructivist Learning Environment Management Skills (SCLEMS)

[The Scale for Constructivist Learning Environment Leadership Skills (SCLELS)]

Factor name	Items
Communication and interaction	I take student opinions into account.
	I encourage the students to take the floor, to speak and to discuss to express their
	I encourage the students to be enterprising.
	I encourage the students to give decisions independently.
	I encourage the students to communicate both with me and each other.
	I support the development of the feeling of responsibility in students.
	I include the students in rule making and decision making process.
	I support the development of self-discipline skills in students.

Relation establishment	I give feedback to the students.
	I give students the opportunity to establish a relation between what they learn and the facts and concepts in nature.
	I ask open-ended questions which provoke thinking in the students.
	I guide the students to give a meaning to what they learn.
	I stimulate the prior knowledge and previous experiences of students in order to facilitate the construction of knowledge.
Skills development	I support the development of question asking, the questioning and research skills
	I support the development of high level thinking skills (e.g., critical thinking, creative thinking etc.) of students.
	I support the development of the problem solving skills of students.
	I support the development of information access and the usage skills of students.
	I support the development of purpose determination and the realization skills of
Time usage and assessment	I give the students the necessary time for answering the questions.
	I give the students enough time in learning activities.
	I encourage students to use the time efficiently and effectively.
	I use different assessment techniques to evaluate the students.
	I take the learning process of the student into consideration, rather than the results in the assessment.
	I encourage the students to make self-assessments.
Learning and teaching	I conduct the lesson by focusing on principal concepts.
	I use various teaching methods and techniques which are consistent with the lesson's purpose.
	I devise some activities in the lesson to attract student attention and to increase
	I devise learning activities for the active learning of the students.
	I center learning around students' interests and needs.
Learning environment organization	I present real life problems or unsolved incidents to the students.
	I make learning possible outside of the school as well as in it.
	I use various real materials and primary sources for supporting the participation
	I prepare an order of seating which facilitates the communication and interaction among the students.