ADAPTING ONLINE SELF-REGULATED LEARNING SCALE INTO TURKISH

Ozgen KORKMAZ
Ahi Evran University, Education Faculty
Department of Computer Education and Instructional Technology,
Kirsehir, TURKEY

Sinan KAYA
Ahi Evran University, Education Faculty
Department of Computer Education and Instructional Technology,
Kirsehir, TURKEY

ABSTRACT

The purpose of this study is to determine online self-regulated learning levels of students by adapting "Online Self-Regulated Learning Scale" designed by Barnard and his colleagues into Turkish. Present study, irrespective of being a scale analysis, is at the same time a qualitative research. It is executed via scan model. Study group of research consists of collectively 222 students.

Firstly the original scale has been translated by two educational technologists who are efficient in both Turkish and English languages. The validity of scale's original factor structure within Turkish culture has been tested via confirmatory factor analysis. In order to measure the reliability of scale, internal consistency analyses have been conducted on data. In order to detect self-regulated learning levels of students; frequency, percentage, arithmetical means, standard deviation and t tests have been employed. In differentiation analyses $p<0,05$ significance level has been considered sufficient. As a result it can reasonably be argued that "Online Self-Regulated Learning Scale" is a valid and reliable scale that can be employed in detecting online self-regulated learning levels of university students in Turkey. Additionally below given results have been obtained regarding students' online self-regulated learning levels: Students' online self-regulated learning skills are generally higher and their highest level of skills is "structuring the environment", whereas the lowest skill is "goal setting". Online self-regulated learning levels of students from Social Sciences Teaching Department are meaningfully lower than the students' online self-regulated learning levels from other departments.

Keywords: **Self-regulated learning, online learning, Scale development, Validity, Reability.**

INTRODUCTION

In learning-teaching environments, the transition from teaching instructor approach to learning student attitude requires in the teaching process the change of students from passive learners into active individuals who knows where and how to acquire the knowledge needed, who can think critically, who bears the responsibility of learning, who can control his/her own learning processes and actively participate in learning process, trusts in his/her own skills and employs these skills in a positive way or in other words learn how to learn (Gülümbay, 2005).

Learning how to learn is regarded as the key to success and life-long learning in this age of information (Doyle, 1994). On that account, the modern educational theories and approaches are constructed in a way to gain these qualities to individuals.

Self-regulated learning approach that expresses an active and constructive process where the individual attempts to regulate his behaviors, metacognitive competency and self-motivation in line with the preset learning objectives, directs and restricts his objectives according to environmental effects bears a significant function in developing life-long learning skills (Pintrich, 2000; Zimmerman, 2002; Wirth & Leutner, 2008). Various researches on self-regulated learning demonstrated the positive and meaningful relationship between motivation levels and employed learning strategies of students and their academic success (Pintrich & De Groot, 1990; Zimmerman & Martinez-Ponz, 1990; Butler & Winne, 1995; Ley & Young, 1998; Chung, 2000). These findings paved the way for the prominence of self-regulation concept in educational field and new position as the key to success in the eyes of educational policy makers and educational psychologists from different nations (Boekaerts, 1999).

In relevant literature it is observed that there are distinctive tools and approaches employed to measure self-regulated learning. Learning and Study Strategies Inventory - LASSI developed by Weinstein and his colleagues (1987), Motivated Strategies for Learning Questionnaire-MSLQ developed by Pintrich and his colleagues (1991), Self-Regulated Learning Interview Schedule - SRLIS developed by Zimmerman and Martinez-Pons (1986) are used as self-evaluation scales. Winne and Perry (2000) stated in their classification measuring self-regulated learning that LASSI, MSLQ and SRLIS tools measure self-regulated learning as a skill. Additionally thinking aloud protocols, error detection tasks, tracing methods, performance observations and structured diaries are also approaches used to measure self-regulated learning in online learning environments specifically (Zimmerman, 2002). According to Zimmerman (1994) the students who employ self-regulated learning skills actively possess three basic qualities.

The first one is that they use several cognitive strategies that assist knowledge structuring and memorizing. The second one is that to control their own progress they actively supervise their own learning by using metacognitive strategies like planning and monitoring.

Finally they focus on their courses and overcome the emotional failures in a rational manner through self-motivation (Miltiadou & Savenye, 2003). Online learning environments that diminish the space, time and physical material limitations to a great extend allow the students to achieve control in studying which course in which way and when (Cunningham & Billingsley, 2003).

Studies on distance education put forth that learner autonomy in such environments is a critical variable in terms of academic success (Kearsley, 2000: Cited in Lynch & Dembo, 2004). Student autonomy which is amongst the significant qualities of students with self-regulated learning skills and of online learning environments manifests that in online learning environments, self-regulated learning is a vital variable for success attainment (Ally, 2004; Hodges, 2005; Fisher & Baird, 2005; Kitsantas & Dabbagh, 2010).

The positive relationship between the academic success in online and blended learning environments and self-regulated learning points out this importance (McManus, 2000; Lynch & Dembo, 2004; Chang, 2007).

In researches that analyzed students' self-regulated learning skills in online and blended learning environments it is seen that in order to measure these skills Motivation and Strategies of Learning Questionnaire (MSLQ) which is basically developed for traditional learning environments is used (Niemi & et al., 2003; Lynch & Dembo, 2004; Chang, 2005; Yukselturk & Bulut, 2007; Chang, 2007; Orhan, 2007; Puzziferro, 2008; Yukselturk & Bulut, 2009; Cabı & Yalın, 2011).

Barnard and his colleagues (2009) underline that in measuring these skills in online environments, using the scales formed for traditional environments is not thoroughly appropriate. The essential features distinguishing online learning environments from traditional learning environments; time and space flexibility, an indirect social interaction, a wide source of information and acquisition of dynamic learning interfaces (Tsai, 2009). On that account in online learning environments students are expected to utilize different learning strategies in an effective and fruitful way. Barnard and his colleagues (2009), by considering the distinctions between traditional and online learning environments, developed Online Self-Regulated Learning Questionnaire (OSLQ) to measure self-regulated learning in online and blended learning environments.

As the relevant literature is examined it has been detected that there is not a Turkish scale available that aims to measure self-regulated learning skills in online learning environments. Within that scope, the objective of present research is to describe online self-regulated learning levels of students by adapting "Online Self-Regulated Learning Scale" into Turkish.

METHOD

Research Model

Present study, irrespective of being a scale analysis, is at the same time a qualitative research. It is executed via scan model. Within this framework, students' self-regulated learning skills in online environments have been attempted to detect.

Study Group

Study group of research consists of collectively 222 students from Ahi Evran University, Faculty of Education 1st year students from Computer Education and Instructional Technologies (CEIT) and Social Sciences Teaching Departments and 2nd year students from Science Teaching Department who take Computer II lesson online. Computer II course is given in the 2nd year to Science Teaching Department students and in the 1st year in all the other departments hence 2nd year Science Teaching Department students have been included in the research. The distribution of students with respect to gender and department is as summarized in Table: 1.

Table: 1
The Distribution of Study Group with respect to Gender and Department

Departments	Female	Male	Total
Science Education	70	36	106
Computer and Instructional technology	28	22	50
Social Science Education	43	23	66
Total	141	81	222

Measurement Tool

Data of this research have been collected via Online Self-regulated Learning Scale of which original name is "Online Self-Regulated Learning Questionnaire (OSLQ)" designed by Barnard and his colleagues (2009).

The scale has been employed on 204 university students receiving academic education in 24 different departments registered to online courses and 434 university students receiving education in 18 different departments in blended learning environment. In order to evaluate psychometric qualities of the scale in obtained data Cronbach alpha (α) values have been calculated for each factor and confirmatory factor analyses have been conducted. At the end of analyses it has been detected that the scale can be employed to measure students' self-regulated learning skills in online and blended learning environments. The permission to adapt the scale into Turkish has been granted via e-mail. The scale developed by Barnard and his colleagues (2009) consists of total 24 items and six factors. Validity and reliability of scale has been tested individually in two different study groups: the first one in the students receiving education in blended learning environment and the other one in online learning environment. In both applications, confirmatory factor analysis has been employed to designate structural validity. In both applications, the parameters indicate acceptable level of compatibility for this 6-factor structure. The factors, numbers of items and internal consistency coefficients in the scale are as summarized in Table: 2.

Table: 2
Internal Consistency Coefficients and Item Numbers with respect to Factors

Factors	Item Number	Internal Consistency Coefficients	
		Blended Learning	Online Learning
Goal Setting	5	0,90	0,92
Structuring the Environment	4	0,86	0,95
Task Strategies	4	0,78	0,87
Time Management	3	0,69	0,96
Help Seeking	4	0,67	0,93
Self-Regulation	4	0,78	0,94
Total	24	0,90	0,92

Scale Adaptation Process

According to Hambleton and Patsula (1999) in the process of scale adaptation, translation step is the one of the most critical phases. In this stage the original scale has been translated by two educational technologists who are efficient in both Turkish and English languages. For the noticeable differences of statement between expert translators, a second opinion has been asked and translation procedures have been finalized. Subsequently the adapted scale has been reviewed and amended by an educational psychologist and language specialist. Final translation form has been retranslated into English by two experts as stated by Hambleton and Patsula (1999) as well and the consistency with the original item structures has been analyzed. In this analysis it has been realized that the items in original scale and the items in the Turkish form have linguistic equivalence. According to Deniz (2007), following this stage the adapted test needs to be applied on test group. Within that scope the test that has been adapted and amended must be applied on pilot group prior to examining psychometric features and it should be detected if there are any other changes need to be done on scale. The test that has been adapted accordingly has been inspected by 18 students from 3rd year in Computer and Teaching Technologies Department and was reevaluated in line with student views. Following the formation of scale form accordingly, in order to evaluate factor structure of scale, structure validity, scale scores' reliability and distinctiveness of items, the scale has been applied on total 222 students who participated in online and blended learning environment. Based on the data obtained from application, factor structures for the Turkish form of scale have been analyzed.

Subsequent to the application of draft scale into study group, the obtained data have been entered to SPSS 15.0 and Lisrel 8.7 programs to conduct scale's validity and reliability analyses statistically. The validity of scale's original factor structure within Turkish culture has been tested via confirmatory factor analysis (Gülbahar & Büyüköztürk, 2008). The basic parameters of confirmatory factor analysis indicated that factor structure of scale is matching the criteria set for model-data compatibility for both first and secondary levels detected in Turkish culture hence explanatory factor analysis was not deemed necessary.

In order to measure the reliability of scale, internal consistency analyses have been conducted on data.

Data Analysis

Factor structure of Online Self-regulated Learning Scale has been analyzed via confirmatory factor analysis. In confirmatory factor analysis, model-data compatibility (fitness) and the hypotheses analyzing the relationship amidst variables are being tested (Kline, 1994; Tabachnick & Fidell, 2001: Cited in Gülbahar & Büyüköztürk, 2008). In confirmatory factor analysis a great number of fit indexes are used to evaluate the validity of model. Amongst them the most frequently used ones are Chi-Square Fit Test, Goodness of Fit Index (GFI), Amended Goodness of Fit Index (AGFI), Root Mean Square of Errors (RMR or RMS) and Root Mean Square Error of Approximation (RMSEA) (Gülbahar & Büyüköztürk, 2008). In literature the smallness of DFA-measured (χ2/sd) ratio from 5 can be regarded as an indicator of the high compatibility of the model with the actual data (MacCallum et al., 1996; Sümer, 2000). For model-data compatibility (fitness) GFI and AGFI values are expected to be above. 90, RMS or standardized RMS and RMSEA values below. 05 (Sümer, 2000; Kline, 2005; Şimşek, 2007). On the other hand the smallness of GFI value from 0.85, the highness of AGFI value from 0.80 and the smallness of RMS value from 0.10 is taken as criteria indicating the compatibility of model with actual data (Anderson & Gerbing, 1984; Marsh et al., 1988; Sümer, 2000; Kline, 2005; Şimsek, 2007). For item distinctiveness effects, item total correlations have been calculated. For scales of which factor structure has been detected and for the sub-scales as well, Cronbach alpha internal consistency coefficients have been measured.

Each item has been scaled as never (1), rarely (2), occasionally (3), generally (4), always (5). The scores that are obtained with the answers given by students to five Likert type scale do not perform a standardized picture due to the differences of item numbers in sub scales. On that account it is appropriate to transform the obtained raw scores into standard scores the lowest of which is 20, the highest is 100. That is because this developed scale aims to reach self-regulated learning score that can be standardized regardless of the features of the group it has been applied. Below given formula can be used in the transformation of raw scores into standard score:

The levels that are the equivalents of scores obtained from sub scales can be given such: 20-51: Low Level; 52-67: Medium Level; 68-100: High Level. On these data obtained in order to detect self-regulated learning levels of students; frequency, percentage, arithmetical means, standard deviation and t tests have been employed. In differentiation analyses $p<0,05$ significance level has been considered sufficient.

FINDINGS

Findings Relevant Of Scale's Validity

Within the framework of the validity analyses of Online Self-Regulated Learning Scale, the prominent structural validity and item-total correlations have been measured and the findings are presented below.

Structure Validity

Confirmatory factor analysis is based on the principle of testing the connections between observed and latent variables as a hypothesis (Pohlmann, 2004). At the end of first level confirmatory factor analysis conducted without any restrictions goodness of fit values have been found out as [χ2 (d=227, N=222)= 327,28, p<.01, RMSEA= 0.045, S-RMR= 0.047, GFI= 0.89, AGFI= 0.85, CFI= 0.99, NNFI= 0.99, IFI= 0.99]. The range of observed values in scale model as X2/d<3; 0<RMSEA<0.05; 0≤S-RMR≤0.05; 0.97≤NNFI≤1; 0.97≤CFI≤1; 0.95≤GFI≤1; 0.90≤AGFI≤1 and 0.95≤IFI≤1 indicates perfect fitness (Sümer, 2000; Kline, 2005; Şimsek, 2007). On the other hand 0.90<GFI<0.95 and 0.85<AGFI<0.90 ranges indicate acceptable fitness. Accordingly except GFI and AGFI, other observed values of model indicate the perfect fitness of data and acceptable fitness for these two values. In other terms the obtained model demonstrates that the factors have been confirmed via data. Second level confirmatory factor analysis has been conducted to show that by the combination of six factors confirmed via first level confirmatory factor analysis of scale, they represent online self-regulated learning variable as an upper concept. As the mainstay for the examined model the relations amidst the latent variables obtained in first level confirmatory factor analysis has been taken as the start.

The goodness of fit values obtained by testing second level factor model formed by adding second level self-regulated latent variable to first level confirmatory structure tested via 6 latent and 24 indicator variables are such [χ2 (233, N=222) = 328,89, p<.001, RMSEA= 0.043, S-RMR= 0.049, GFI= 0.89, AGFI= 0.86, CFI= 0.99, NNFI= 0.99, IFI= 0.99].

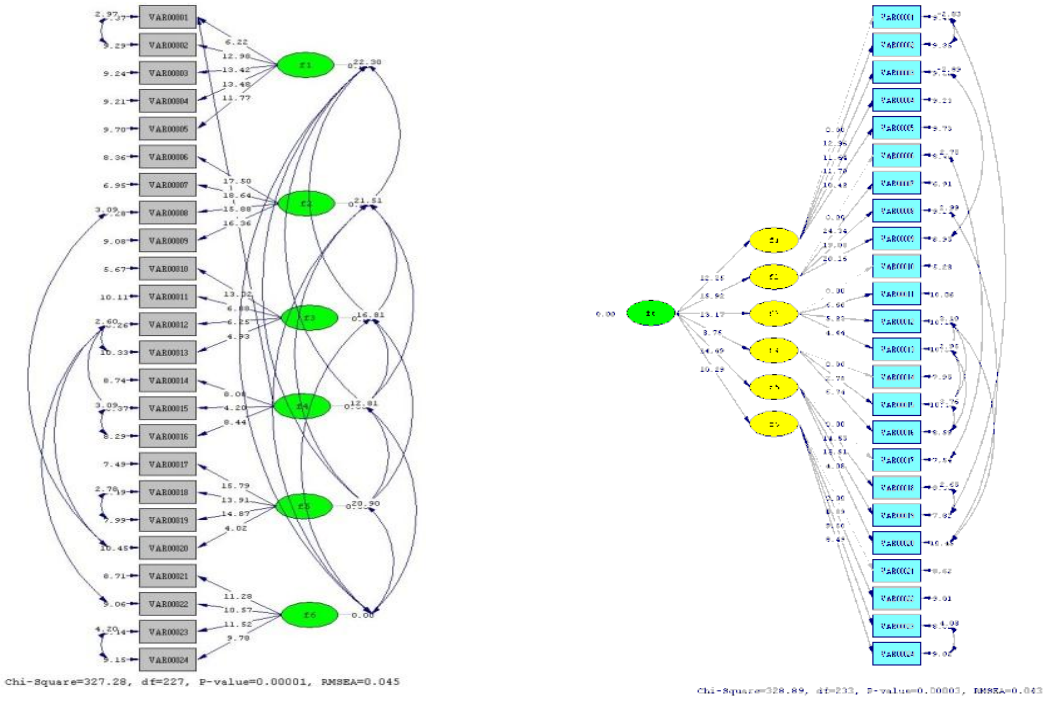

Figure: 1
Scale's First and Second Level Confirmatory Factor Analysis
Connection Diagram (t-values)

Accordingly except GFI and AGFI, other observed values of model indicate the perfect fitness of data and acceptable fitness for the two values (Sümer, 2000; Kline, 2005; Şimsek, 2007). Connection diagram and t-values of the scale's first and second level confirmatory factor analyses have been presented in Figure 1.

Factor loads (Lambda x, λx)between first level latent variables and self-regulated learning that is upper level (second level) variable, t values, measurement errors (delta δ) and explanation ratios (R^2) of second level variable on first level variables are given in Table: 3.

Table: 3
The Scale's λx , δ, t and R^2 Values directed to Second Level Confirmatory Factor Analysis Upper Concept-Sub-Concept Relation

Second Level Variable	First Level Variables	λx coefficient	δ coefficient (Measurement error)	t	R2
Self-Regulated Learning	Goal Setting	0,95	0,047	12,25	0,95
	Structuring the Environment	0,94	0,10	15,92	0,90
	Task Strategies	0,92	0,14	13,17	0,86
	Time Management	0,88	0,15	8,75	0,84
	Help Seeking	0,95	0,11	14,49	0,89
	Self-Regulation	0,92	0,23	10,29	0,79

As the path coefficients and t values between second level "self-regulated learning" latent variable and first level latent variables are analyzed, meaningful and positive relations ($p<0.05$) have been detected between self-regulated learning and 6 dimensions relevant of this factor. As the variances explained by self-regulated learning second level variable on first level variables are examined, amongst the first level variables the highest explanation has been made on goal setting (R^2 =0.95) variable, the smallest explanation has been made on self-evaluation (R^2 =0.79) variable.

Item Distinctiveness

In this section by means of item-total correlation method, the correlations between scores obtained from each item in factors and scores obtained from factors have been measured to test the item distinctiveness levels. The acquired item-factor correlation values obtained for each single item are presented in Table: 4.

Table: 4
Item-Factor Scores Correlation Analysis

F1		F2		F3		F4		F5		F6	
I.	r	I.	r	I.	r	I.	r	I.	r	I.	r
1	,828(**)	6	,929(**)	10	,741(**)	14	,692(**)	17	,854(**)	21	,764(**)
2	,841(**)	7	,946(**)	11	,716(**)	15	,670(**)	18	,864(**)	22	,764(**)
3	,824(**)	8	,905(**)	12	,699(**)	16	,795(**)	19	,879(**)	23	,841(**)
4	,803(**)	9	,911(**)	13	,618(**)			20	,483(**)	24	,790(**)
5	,768(**)										
N=222; **=p<, 001											

As demonstrated in Table 4, for item test correlation coefficients, the first factor changes between 0,768 and 0,828; the second factor 0,905 and 0,946; the third factor 0,618 and 0,741; the fourth factor 0,670 and 0,795; the fifth factor 0,483 and 0,879; the sixth factor 0,764 and 0,841. Each item is involved in a meaningful and positive relation with the overall factor ($p<0,001$).

These coefficients are the validity coefficients of each item and represent the consistency with the overall factor; in other words it represents the level of service capacity to the overall objective of the factor (Carminesi & Zeller, 1982; Yüksel, 2009).

Findings related to the Reliability of Scale

Internal consistency analyses have been conducted on the data to measure the reliability of scale. Table: 5

Reliability Analysis Results relevant of the Scale in General and Factors

Factors	Item Number	Sperman Brown	Guttmann Split-Half	Cronbach Alpha
Goal Setting	5	,869	,820	,871
Structuring the Environment	4	,931	,928	,941
Task Strategies	4	,685	,679	,741
Time Management	3	,753	,717	,632
Help Seeking	4	,807	,802	,780
Self-Regulation	4	,740	,739	,798
Total	24	,931	,919	,948

Reliability analysis of the scale with respect to factors and as a whole has been made according to Cronbach alpha reliability coefficient, Sperman-Brown formula and Guttmann split-half reliability formula. Reliability analysis values with respect to each factor and scale in general are summarized in Table: 5. As presented in Table 5, Sperman Brown reliability coefficient of the scale consisting of 6 sub-factors and total 24 items is 0,931; Guttmann Split-Half value is 0,919; Cronbach alpha reliability coefficient is 0,948. Also it is observed that with respect to factors Sperman Brown reliability coefficients gained values between 0,740 and 0,931; Guttmann Split-Half values between 0,679 and 0,928; Cronbach alpha values between 0,632 and 0,941.

Findings relevant of Online Self-regulated Learning Levels of Students

Online self-regulated learning levels of students attending web-based learning practices are as summarized in Table 6.

Table: 6

Students' Online Self-regulated Learning Levels

Factors	N	$\bar{X}$	sd	Min	Max	Levels (f/%)					
						Low		Medium		High	
Goal Setting	222	63,80	18,28	20	100	68	30,6	57	25,7	97	43,7
Structuring the Environment		66,78	25,03	15	100	70	31,5	18	8,1	134	60,4
Task Strategies		61,24	15,71	20	95	64	28,8	75	33,8	83	37,4
Time Management		61,83	14,93	20	100	43	19,4	110	49,5	69	31,1
Help Seeking		64,55	18,88	25	100	61	27,5	37	16,7	124	55,9
Self-Regulation		64,68	17,71	20	100	58	26,1	56	25,2	108	48,6
Total		63,90	15,87	22,5	95	61	27,5	51	23,0	110	49,5

As shown in Table 6, students' self-regulated learning skill scores change between 22,5 and 95; the mean is $\bar{X}$=63,90. As data on self-regulated learning skill levels are examined it is detected that almost half of the students (49,5%) have high, 23% have medium and 27,5% have low level self-regulation skills. Accordingly it can be argued that students' online self-regulated learning skills are high.

As the scores obtained from each single factor are examined it has been detected that the factor with the highest average is "Structuring the Environment" ($\bar{X}$=66,78), the lowest factor is "Task Strategies" ($\bar{X}$=61,24).

As the factors are analyzed with respect to their levels it appears that the factor with the highest skill levels in the group with high score is "Structuring the Environment" (60,49%), the lowest factor in high group is "Time Management" (31,1%).The highest factor in medium level group is "Time Management" (49,5%), the lowest factor is "Structuring the Environment" (8,11%). The highest ratio factor in low group is "Structuring the Environment" (31,5%), the lowest factor is "Time Management" (19,4%). Hence it can be stated that the highest level skills with respect to students' online self-regulated learning levels is "Structuring the Environment", the lowest one is "Goal Setting". In Table 7, the findings relevant of students' online self-regulated learning skill levels with respect to gender are summarized.

Table: 7
The Effect of Gender on Students' Online Self-regulated Learning Skills

Variables		N	$\bar{X}$	sd	t	sd	p
Goal Setting	Female	141	63,01	17,81	-,854	220	,394
	Male	81	65,19	19,10			
Structuring the Environment	Female	141	65,64	26,05	-,896	220	,371
	Male	81	68,77	23,18			
Task Strategies	Female	141	62,20	15,61	1,202	220	,231
	Male	81	59,57	15,84			
Time Management	Female	141	61,18	14,55	-,855	220	,393
	Male	81	62,96	15,60			
Help Seeking	Female	141	64,54	18,82	-,011	220	,991
	Male	81	64,57	19,09			
Self-Regulation	Female	141	65,46	18,27	,861	220	,390
	Male	81	63,33	16,71			
Total	Female	141	63,75	15,98	-,185	220	,854
	Male	81	64,16	15,77			

As given in Table 7, there is not a meaningful difference in students' online self-regulated learning skills with respect to gender ($t_{(2-220)}$=-0,185; p>0,05).

Therefore it can reasonably be argued that gender has no effect on students' online self-regulated learning skill levels.

In Table 8, findings relevant of students' online self-regulated learning levels with respect to their departments are given.

Table: 8
Students' Online Self-regulated Learning Levels with respect to Departments

Variables	Sceince Education (N=106)		CEIT (N=50)		Social Sceince Education (N=66)	
	$\bar{X}$	Ss	$\bar{X}$	Ss	$\bar{X}$	Ss
Goal Setting	72,38	12,82	73,92	10,85	42,36	10,78
Structuring the Environment	80,14	14,07	82,10	12,25	33,71	10,75
Task Strategies	68,58	12,83	64,10	12,11	47,27	13,04
Time Management	65,79	12,82	66,13	13,86	52,22	14,63
Help Seeking	73,63	13,32	74,40	9,40	42,50	12,47
Self-Regulation	71,60	13,51	73,40	11,31	46,97	14,83
Total	72,30	9,64	72,67	8,16	43,76	8,38

In Table 8, it is demonstrated that in terms of total score as well as factors, the students that bear the lowest online self-regulated learning levels are from Department of Social Sciences Teaching.

Table: 9
The Effect of Departments on Students' Online Self-regulated Learning Levels

Variables		Sum of Squares	df	Mean Square	F	Sig.	Scheffe
Goal Setting	Between Groups	43247,421	2	21623,710	154,840	,000	Between social science ed. and others
	Within Groups	30583,858	219	139,652			
	Total	73831,279	221				
Structuring the Environment	Between Groups	102829,277	2	51414,639	315,906	,000	Between social science ed. and others
	Within Groups	35642,908	219	162,753			
	Total	138472,185	221				
Task Strategies	Between Groups	19003,020	2	9501,510	58,563	,000	Between social science ed. and others
	Within Groups	35531,327	219	162,244			
	Total	54534,347	221				

Time Management	Between Groups	8677,383	2	4338,692	23,416	,000	Between social science ed.

	Within Groups	40577,672	219	185,286			and others
	Total	49255,055	221				
Help Seeking	Between Groups	45683,804	2	22841,902	151,261	,000	Between social science ed. and others
	Within Groups	33071,151	219	151,010			
	Total	78754,955	221				
Self-Regulation	Between Groups	29584,630	2	14792,315	81,511	,000	Between social science ed. and others
	Within Groups	39743,298	219	181,476			
	Total	69327,928	221				
Total	Between Groups	38078,154	2	19039,077	237,186	,000	Between social science ed. and others
	Within Groups	17579,241	219	80,271			
	Total	55657,395	221				

As demonstrated in Table 9, students' departments created in terms of both total score and factors, a meaningful differentiation on their online self-regulated learning levels ($F_{(2-219)}$=237,186; p<0,001). According to the Scheffe analysis, the meaningful difference created by departments on students' online self-regulated learning levels stems from Social Sciences Teaching Department. With respect to total score the student group in Social Sciences Teaching department has a score average $\bar{X}$=43,79 on online self-regulated learning level whereas the students from Science Teaching departments have $\bar{X}$=72,30, Computer and Teaching Technologies Department students have $\bar{X}$=72,67 score average. It can thus be asserted that online self-regulated learning levels of students from Social Sciences Teaching Department is meaningfully lower than students receiving training in the other two departments.

CONCLUSION AND DISCUSSION

In present study, "Online Self-regulated Learning Scale" has been adapted into Turkish to detect students' online self-regulated learning levels. This is a five Likert scale consisting of 24 items that can be collected under six factors. Each item stated under factors has been scaled as never (0), rarely (1), occasionally (2), generally (3), always (4).

First level and second level confirmatory factor analyses have been conducted to confirm the factor structures of scale. The findings obtained from confirmatory factor analysis put forth that according to both first and second level confirmatory factor analyses' observed values of scale model are, except GFI and AGFI indexes, perfectly compatible with all the other indexes and satisfactorily compatible for these two indexes.

In other terms it has been detected that the obtained model is confirmed via data. In order to determine the level that each item in scale can measure the qualities that are attempted to be measured via the factor it belongs to, item factor correlations have been calculated on data.

The correlation between score obtained from each item and score obtained from the factor item belongs to is used as a criterion in designating the service capacity level of each scale item to the overall objective of factor (Balcı, 2009). Accordingly the correlation values between each scale item and scores obtained from the factor item belongs to change between 0,483 and 0,879. Hence it can be asserted that

each item and each factor in the scale serves meaningfully to the characteristics aimed to be measured via the whole scale and each item has the desirable level of distinctiveness. Internal consistency coefficients of scale have been calculated via Cronbach Alpha, Sperman-Brown formula and Guttmann Split-half reliability formula. Sperman Brown reliability coefficient of scale is detected to be 0,931; Guttmann Split-Half value 0,919; Cronbach alpha reliability coefficient as 0948. On the other hand factors' Sperman Brown reliability coefficients are valued between 0,740 and 0,931; Guttmann Split-Half are between 0,679 and 0,928; Cronbach alpha are between 0,632 and 0,941 and these values all prove that the scale is efficient to conduct reliable measurements. Indeed the reliability coefficient values equal to and above 0,70 are taken as a criterion for scale reliability (Büyüköztürk, 2002; Gorsuch, 1983). Consequently it can reasonably be argued that "Online Self-regulated Learning Scale" is a valid and reliable scale that can be employed in detecting online self-regulated learning levels of university students in Turkey.

Additionally below given results have been obtained regarding students' online self-regulated learning levels: Students' online self-regulated learning skills are generally higher and their highest level of skills is "structuring the environment", whereas the lowest skill is "goal setting". Students' online self-regulated learning levels do not differ with respect to gender.

Yukselturk and Bulut (2009) reported that in programming language courses presented online and Tsai (2009) noted that in online geology course, students' self-regulated learning levels did not differ with respect to gender hence it can be deduced that students' online self-regulated learning levels did not differentiate with respect to the departments they attended. Online self-regulated learning levels of students from Social Sciences Teaching Department are meaningfully lower than the students' online self-regulated learning levels from other departments. A review of literature indicated no research analyzing the effect of academic field on students' online self-regulated learning levels. In traditional learning environments on the other hand as stated by Şimşek and Balaban (2010), drill strategies, metacognitive strategies and motivation strategies employed by university students changed with respect to their faculties. In the study covering university students from faculties of science, engineering, communication, fine arts, physical education and sports college it has been obtained that in terms of the highest level of application of these three strategies students from physical education and sports college got the highest scores whereas fine arts faculty students received the lowest scores. In relevant literature there are limited researches on students' online self-regulated learning skills. Within this framework it can be suggested that various studies can be conducted to analyze students' self-regulated learning skills in online environments

BIODATA and CONTACT ADDRESSES of AUTHORS

Ozgen KORKMAZ was born in 1972 in Konya. He graduated Industrial Arts Education Faculty, Department of Computer Teacher in 1993 at Gazi Un. He graduated Institute of Science Department of Computer Education Master Program, in 1996 at Afyon Kocatepe Un. He graduated Institute of Educational Sciences Department of Educational Technology PhD Program in 2007 at Gazi Un. Currently he is working as assistant professor at Ahi Evran Un. Education Faculty Department of Computer Education and Instructional Technologies. His research interests include web based learning, blended learning, message design and web based programming technologies.

Dr. Özgen KORKMAZ, Ahi Evran University, Education Faculty
40100 Kirsehir, TURKEY
Phone: + (90) 5053192755
E-mail: ozgenkorkmaz@gmail.com

Sinan KAYA was born in Samsun, Turkey, in 1980. He graduated from Gazi University, Faculty of Technical Education, Department of Electronic and Computer Education in 2002. He received his M.S from Gazi University, Institute of Science and Technology, Department of Electronic and Computer Education, in 2005. He is still a Ph.D candidate from doctorate program at Institute of Educational Sciences, Department of Educational Technology Program in Gazi University since 2007. Currently he is working as lecturer at Ahi Evran University, Faculty of Education, Department of Computer Education and Instructional Technologies. His research interest includes analogies and metaphors as instructional materials, instructional design and intelligent tutoring systems.

Lecturer Sinan KAYA, Ahi Evran University, Faculty of Education
Department of Computer Education and Instructional Technologies
40100 Kırsehir, TURKEY
Phone: + (90) 5053543326
E-mail: sinankaya14@gmail.com

REFERENCES

Ally, M. (2004). Foundations of educational theory for online learning. In T. Anderson (Ed.), *The theory and practice of online learning* (pp. 15-44). Edmonton, CA: Athabasca University Press.

Anderson, J. C. & Gerbing, D. W. (1984). The effect of sampling error on convergence, improper solutions, and goodness-offit indices for maximum likelihood confirmatory factor analysis. *Psychometrika,* 49, 155-173.

Balcı, A. (2009). *Sosyal bilimlerde araştırma: Yöntem, teknik ve ilkeler [Research in social sciences: Method, technique and principles]*. Ankara: PegemA Press.

Barnard, L., Lan, W.Y., To, Y.M., Paton, V.O. & Lai, S.L. (2009) .Measuring self-regulation in online and blended learning environments. *The Internet and Higher Education*, 12, 1-6.

Boekaerts, M. (1999). Self–regulated learning: Where we are today. *International Journal of Educational Research*, 31(6), 445-457.

Butler, D. & Winne, P. (1995). Feedback and SRL: A theoretical synthesis. *Review of Educational Research*, 65, 245-281.

Büyüköztürk, Ş. (2002). *Sosyal bilimler için veri analizi el kitabı [Data analysis handbook for social sciences].* Ankara: PegemA Press.

Cabı, E. & Yalın, H. I. (2011). Öz düzenlemeye dayalı karma öğrenimin öğrenci motivasyonuna etkisi [The effect of self-regulation based blended education on student motivation]. *Educational Technology Theory and Practice,* 1(1), 125-142.

Carmines, E. G. & Zeller, R. A. (1982). *Reliability and validity assessment*. 5th ed. Beverly Hills: Sage Publications Inc.

Chang, M.M. (2007). Enhancing web-based language learning through self-monitoring. *Journal of Computer-Assisted Learning*, 23, 187-196.

Chang, M-M. (2005). Applying self-regulated learning strategies in a web-based instruction - An investigation of motivation perception. *Computer Assisted Language Learning*, 18(3), 217-230.

Chung, M. (2000). The development of self-regulated learning. *Asia Pacific Education Review*, 1(1), 55-66.

Cunningham, C. A. & Billingsley, M. (2003). *Curriculum Webs: A practical guide to weaving the Web into teaching and learning*. Boston: Allyn and Bacon.

Deniz, K. Z. (2007). The adaptation of psychological scales. *Ankara University, Journal of Faculty of Educational Sciences,* 40(1), 1-16.

Doyle, C. S. (1994). *Information literacy in an information society: A concept for the information age*. Syracuse University, New York: ERIC, ED372763.

Fisher, M. & Baird, D. E. (2005). Online learning design that fosters student support, self-regulation, and retention. *Campus-Wide Information Systems,* 22(5), 88-107.

Gorsuch, R. L. (1983). *Factor analysis*. Hillsdale: Lawrence Erlbaum Associates.

Gülbahar, Y. & Büyüköztürk, S. (2008). Değerlendirme tercihleri ölçeğinin Türkçeye uyarlanması [Adaptation of evaluation choices scale into Turkish]. *Hacettepe University Journal of Education,* 35, 148-161.

Gülümbay, A. A. (2005). Yükseköğretimde web'e dayalı ve yüz yüze ders alan öğrencilerin öğrenme stratejilerinin, bilgisayar kaygılarının ve başarı durumlarının karşılaştırılması [Comparison between web-based and face-to-face trainees in higher education with respect to learning strategies, computer anxieties and success rates]. Unpublished Doctorate Thesis. Eskişehir: Anadolu University, Institute of Educational Sciences,

Hambleton, R.K. & Patsula, L. (1999). Increasing the validity of adapted tests: myths to be avoided an guidelines for improving test adaptation practices. *Journal of Applied Testing Technology*, August 1999 Issue. Online: http://data.memberclicks.com/site/atpu/volume%201%20issue%201Increasing%20validity.pdf

Hodges, C. B. (2005). Self-regulation in web-based courses: A review and the need for research. *The Quarterly Review of Distance Education*, 6(4), 375-383.

Kearsley, G. (2000). *Online education: learning and teaching in cyberspace*. Belmont, CA.: Wadsworth.

Kitsantas, A. & Dabbagh, N. (2010). *Learning to learn with integrative learning technologies (ILT): A practical guide for academic success*. Information Age Publishing.

Kline, P. (1994). *An easy guide to factor analysis*. London and New York: Routledge.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*, 2nd ed, New York: Guilford Press.

Ley, K. & Young, D. B. (1998). Self-regulation behaviors in underprepared (developmental) and regular admission college students. *Contemporary Educational Psychology*, 23, 42-64.

Lynch, R. & Dembo, M. (2004). The relationship between self-regulation and online learning in a blended learning context. *International Review of Research in Open and Distance Learning*, 5(2), 1-16.

Maccallum, R. C., Browne, M. W. & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods,* 1, 130-149.

Marsh, H. W., Balla, J. R. & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin,* 103, 391-410.

McManus, T. F. (2000). Individualizing instruction in a web-based hypermedia learning environment: Nonlinearity, advance organizers, and self-regulated learners. *Journal of Interactive Learning Research*, 11, 219-251.

Miltiadou, M. & Savenye, W. C. (2003). Applying social cognitive constructs of motivation to enhance student success in online distance education. *Educational Technology Review*, 11(1), 78-95. Norfolk, VA: AACE.

Niemi, H., Anne, N. & Virtanen, P. (2003). Towards self-regulation in web-based learning. *Learning, Media and Technology*, 28(1), 49-71.

Orhan, F. (2007). Applying self-regulated learning strategies in a blended learning instructions. *World Applied Sciences Journal*, 2(4), 390-398.

Pintrich, P. R. & De Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33-40.

Pintrich, P. R. (2000). The roal of goal orientation in self-regulated learning. In M. Boekaerts, P. R., Pintrichve M. Zeidner (Eds.), *Handbook of self-regulation*, pp. 451-502. San Diego, CA: Academic Press.

Pintrich, P.R., Smith, D.A. F., Garcia, T. & McKeachie, W.J. (1991). *A manual for the use of the motivated strategies for learning*. Michigan: School of Education Building, The University of Michigan. ERIC database number: ED338122.

Pohlmann, J.T. (2004). Use and Interpretation of Factor Analysis in The Journal of Educational Research: 1992-2002. *The Journal of Educational Research*, 98(1), 14-23

Puzziferro, M. (2008). Online technologies self-efficacy and self-regulated learning as predictors of final grade and satisfaction in college-level online courses. *American Journal of Distance Education*, 22(2), 72-89.

Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar [Structural equation models: Basic concepts and sample applications]. *Turkish Psychology Literature,* 3(6), 49-74.

Şimşek, A. & Balaban, J. (2010). Learning strategies of successful and unsuccessful university students.*Contemporary Educational Technology*, 1(1), 36-45

Şimşek, Ö. F. (2007). *Yapısal Eşitlik Modellemesine Giriş* [*Introduction to Structural Equation Modeling]*. Ankara: Ekinoks.

Tabachnick, B. G. & Fidell, L.S. (2001). *Using multivariate statistics* (4th edition). Boston: Allyn and Bacon.

Tsai, M. J. (2009). The model of strategic e-learning: Understanding and evaluating student e-learning from metacognitive perspectives. *Educational Technology & Society*, 12(1), 34-48.

Weinstein, C.E., Schulte, A.C. & Palmer, D.R. (1987). *LASSI: Learning and study strategies inventory*. Clearwater, FL: H. & H.

Winne, P.H. & Perry, N.E. (2000). Measuring self-regulated learning. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 532–566). Orlando, FL: Academic Press.

Wirth, J. & Leutner, D. (2008). Self-regulated learning as a competence. Implications of theoretical models for assessment methods. *Journal of Psychology*, 216(2), 102-110.

Yukselturk, E. & Bulut, S. (2007). Predictors for student success in an online course. *Educational Technology & Society*, 10(2), 71-83.

Yukselturk, E. & Bulut, S. (2009). Gender differences in self-regulated online learning environment. *Educational Technology & Society*, 12(3), 12–22.

Yüksel, S. (2009). Eğitim Fakültesi Öğrencilerinin İnformal Etkileşimleri ve Akademik Başarılarıyla İlişkinin İncelenmesi [Analysis of Educational Faculty Students' Informal Interactions association with their Academic Success]. *Ahi Evran University Faculty of Education Journal,* 10(2), 119-127

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70.

Zimmerman, B.J. & Martinez-Pons, M. (1986). Development of a structured interview for assessing students' use of self-regulated learning strategies. *American Educational Research Journal*, 23, 614-628.

Zimmerman, B. J. & Martinez-Pons, M. (1990). Student differences in self-regulated learning: relating grade, sex and giftedness to self-efficacy and strategy-use. *Journal of Educational Psychology*, 82(1), 51-59.

Zimmerman, B. J. (1994). Dimensions of academic self-regulation. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 3-21). Hillsdale, NJ: Lawrence Erlbaum.