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The Development of Classroom Environment Perceptions Scale for Pre-Service Teachers[1]

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Abstract

The purpose of this research study was to develop a classroom environment instrument for assessing pre-service teachers' classroom environment perceptions and investigate its validity and reliability. In this study, the instrument was developed according to constructivism, environment congruence theory and also the studies of Fraser and his colleagues. The pilot form of Classroom Environment Perceptions Scale of Pre-Service Teachers (CEPSPT) consisted of 60 items. It included Moos' (1974) three dimensions of classroom environments. For the exploratory factor analysis (EFA) 520 pre-service teachers and for the confirmatory factor analysis (CFA) 280 pre-service teachers participated in the study. By implementing EFA and CFA, the factor structure of CEPSPT was confirmed. The internal consistency of sub-scales changed from .72 to .85. As a result, the CEPSPT included 38 items and consisted of six sub-scales.

Keywords: Classroom environment, factor analysis, pre-service teachers, psychosocial learning environment, scale development.

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Fraser (1986, p. l), firstly defined the word *environment* as "shared perceptions of students and teachers in that environment" later, Dorman, Adams and Ferguson (2003, p. 2) stated that the concept of environment when applied to educational settings refers to "the atmosphere, ambience, tone or climate that pervade the particular setting". According to them, without a comprehensive consideration of classroom environments, educational productivity cannot be provided. In addition to cognitive and demographic characteristics that students bring into the educational settings, it is also important to consider the psychosocial aspects of classroom environment.

Firstly, social psychologists interested in the learning environment and conducted studies. In this sense, Thomas conducted earliest research about classroom environment in the 1920s in the United States and focused on the observation and recording of events that took place in the classroom environment rather than their psychological meanings (Chavez, 1984). Then Lewin (1936) improved the research related to classroom environment and by proposing the field theory explained that a behavior stems from the relationship between a person and the environment where people share the atmosphere (as cited in Fraser, 1987). However, according to these definitions personal needs of an individual were not taken into account (Coll, Taylor, and Fisher, 2002; Fraser, 1987). Hence, Murray (1938) put forward the needs-press model (as cited in Fraser, 1987). Murray (1938) explained that while personal needs are related to personality characteristics which motivate people for certain goals, environment is an external situation for the expression of personality needs since the needs of individuals are evoked by the environment (as cited in Fraser, 1987). In addition to these, Stern (1970) explained that in an environment where personality characteristics and environmental conditions are in congruence, this environment enhances student outcomes by proposing person-environment congruence theory (as cited in Goh and Fraser, 1998).

Later, with the works of Walberg and Anderson (1968) the modern era of classroom environment research started. Moos (1974) delineated psychosocial classroom environment by including relationship, personal development and system maintenance and system change dimensions (Fraser and Treagust, 1986). While the affinity and nature of personal relationships within a specific environment were included in relationship dimension, availability of different occasions for students' improvement was stated as personal development property of classroom environment. Finally, system maintenance and system change dimension is about the order of the classroom environment and the clearity of students' daily or weekly responsibilities. The sub-scales encompassed by these dimensions were defined by Fraser and his colleagues and were indicated in Appendix A. Then, although many researchers have studied the classroom environment, extensive works have been conducted by Fraser and his colleagues.

The classroom environment has been studied generally in terms of the physical environment (furniture, lighting, seating arrangements, etc.) but the psychosocial

properties of the classroom environment (involvement, satisfaction cooperation, student cohesiveness, democracy, task-orientation, rule clarity, teacher control, innovation, competition, student-teacher and student-student interactions, etc.) have taken the attention of educators recently. According to results of many studies, if psychosocial classroom environment is perceived positively by students, their cognitive and affective outcomes are enhanced (Afari, Aldridge, Fraser and Khine, 2013; Dorman et all., 2003; Fraser, 1998; Fraser and Treagust, 1986; LaRocque, 2008; Velayutham and Aldridge, 2013) as it was also indicated by Stern (1970) according to person-environment congruence theory (cited in Goh and Fraser, 1998).

Chionh and Fraser (2009) stated that when students perceive the classroom environment favorable, they learn better. Also, LaRocque (2008) explained that if students perceive the classroom environment as supportive and non-threatening in terms of teacher-student interaction their achievement and also enjoyment of the courses increase. On the other hand, if students experience classrooms as having fewer opportunities for choice, cooperation and collaboration with peers, students' involvement levels and achievement scores decline in that environments (Wang, 2012). LaRocque (2008) observed that when students perceived difficulty in the environment, they felt that they would not achieve and as a result their grades on mathematics and reading got lower.

The results of meta-analysis studies showed positive correlations among different dimensions of classroom environment like satisfaction, student cohesiveness, task orientation, democracy and learning outcomes. On the other hand, there were negative correlations among some of the dimensions of classroom environment like cliqueness, disorganization, friction and learning (Haertel, Walberg, and Haertel, 1981; O'Reilly, 1975).

Fraser, Pearse and Azmi (1982) stated that Indonesian students in Grades 8th and 9th satisfied in classes which were perceived as having more involvement opportunities and less independence. Moreover, they stated that students felt anxiety lower in classes which were experienced as having more involvement, affiliation and differentiation in activities and tasks. In addition, one of the significant properties of classroom environment is the involvement since it promotes active learning rather than just listening passively and receiving information sent by teacher. In classrooms where students perceive greater involvement discuss their ideas, participate in different activities with their peers and perceive greater enjoyment of lessons (Rentoul and Fraser, 1980).

Atbas (2004), found that teacher support and involvement properties of classroom environment were significant predictors of achievement in English. Chien (2007) showed the positive correlations among business management students' perceptions of teacher support, task orientation, equity properties of classroom environment and attitudes towards the subject. Similarly, Chionh and Fraser (2009) found that if Singaporean 10th grade students perceive the equality, task orientation and teacher support properties in mathematics and geography classes, they have more

favorable attitudes. It can be said that for positive attitudes, high self-esteem and achievement, instructors should inform students about rules, provide structure in tasks and activities and determine high standards for the achievement of students'. Similarly, students had greater enjoyment in science classes where they perceived the teacher as dominant and cooperative as found by den Brok, Fisher and Scott (2005).

Chionh and Fraser (2009) indicated that students obtain higher grades in classrooms which were perceived at high level in terms of student cohesiveness. Similarly, Velayutham and Aldridge (2013) found student cohesiveness, and task orientation properties of classroom environment as important predictors of motivation and self-regulation.

There are many studies which were conducted in order to evaluate different curricula in classes with different properties (Fraser, 1987; Fresko, Carmeli and Ben-Chaim, 1989; Teh and Fraser, 1995). Moreover, many researchers (Ben-Chaim, Fresko and Carmeli, 1990; Chien, 2007; McRobbie, Roth and Lucus, 1997; Roth 1998) compared the perceptions of students and teachers in the same classroom environment. Also, in terms of classroom environment, cross-cultural studies were conducted (Aldridge and Fraser, 2000). Finally, relationships between classroom environment perceptions and different variables like achievement (Chionh and Fraser, 2009; Roth 1998), attitude (Goh and Fraser, 2000), autonomy and student-centeredness (Roth 1998), motivation (Arısoy, 2007), satisfaction (Fraser and Treagust, 1986), self-esteem (Chionh and Fraser, 2009), academic efficacy (Dorman et all., 2003), self-regulation (Velayutham and Aldridge, 2013) have been reiterated by using different classroom environment instruments in different countries and grade levels (Fraser, 1998).

The pre-mentioned studies included different classroom environment instruments to investigate the perceptions of teachers and students about specific classroom contexts like online classroom environments, flipped classroom environments, computer-assisted classroom environments, constructivist classroom environments and laboratory environments. For instance, Cubukcu (2012) expressed that constructivist approach supports student-centered learning and teaching which takes students' interests, demands and needs into consideration, hence, establishes an efficient learning environment. In constructivist classroom environments, it was expected that students experience personal relevancy, critical voice, student negotiation, shared control and critical voice properties of psychosocial classroom environment positively for active and effective learning.

Strayer (2007) investigated the psychosocial aspects of classroom environment by conducting an experimental study in statistics course where students were taught according to flipped classroom and traditional teaching principles. It was found that students in the flipped classroom cooperated more and accepted new teaching methods; however, they perceived the flipped classroom less satisfying in terms of classroom structure to orient them to the learning tasks. Students expected more structured classes in a technology rich environment. The perceptions of students'

classroom environment is affected by context and their perceptions may change according to course, teaching method and grade level. Hence, in the current study, while developing a new instrument, different classroom environment contexts were taken into consideration. According to flipped learning students are expected to learn by watching teacher-created videos at home and conduct different activities in-class time with their peers (Davies, Dean, and Ball, 2013; Sams and Bergmann, 2013). According to this approach, since students learn out of the class by themselves the individualization and difficulty properties of psychosocial classroom environment are important. Also, students conduct different activities with their peers in class. Hence, cooperation, student cohesiveness, involvement, innovation and democracy properties of psychosocial classroom environment are quite important for effective learning. Finally, how students were directed to learn by their instructors both in the class and out of the class is also important to enhance the motivation of students. Hence, the task-orientation property of psychosocial classroom environment should be taken into consideration.

In the literature, main classroom environment instruments were developed by Fraser and his colleagues (Fraser, 1980; Fraser, Anderson and Walberg, 1982; Fraser, Giddings and McRobbie, 1992; Fraser, McRobbie and Fisher 1996; Rentoul and Fraser, 1980; Taylor, Fraser and Fisher, 1997; Fraser and Treagust, 1986; Trickett and Moos, 1973; Wubbels and Levy, 1993 as cited in Fraser, 1998). The scales and the main classroom environment instuments were shown in Appendix A. Besides main instruments, researchers developed an array of modified versions of these main classroom environment instruments which were used to assess a particular environment under investigation like University Mathematics Classroom Environment Questionnaire (UMCEQ) (Yin and Lu, 2014).

Significance of the Study

The main classroom environment scales were adapted or modified to be used in many research studies, in different classes and grade levels. For example, by using the items of Learning Environment Instrument (LEI) and Classroom Environment Scale (CES), the College and University Classroom Environment Inventory (CUCEI) was developed. Moreover, the What Is Happening In this Class? (WIHIC) questionnaire was formed by using the items and scales of the existing classroom environment instruments. Even though, there are numerous classroom environment instruments, some theoretical and methodological shortcomings were noticed to be used in teacher training classrooms.

First of all, many of the pre-mentioned instruments, which were shown in Appendix A, were developed to evaluate the psychosocial environment of primary or secondary schools rather than higher education institutions. On the other hand, one of the instruments used in higher education institutions, the CUCEI was developed basically to evaluate the post-graduate or seminar classes not specifically for undergraduate classes.

In addition to these, most of the instruments provided information about undergraduate students' general perceptions about the classroom environments rather than the perceptions of pre-service teachers specifically. Hence, in the current study, it was thought important to develop a new classroom environment scale to assess pre-service teachers' psychosocial classroom environment perceptions majoring in educational sciences.

Finally, there have been few studies about the development or adaptation of instruments for assessing classroom environments in Turkey. Although some researchers contributed classroom environment research by cross-validating or translating instruments that originated in English (Atbas, 2004; Kesal, 2003; Kucukozer, Kirtak-Ad, Ayverdi and Egdir, 2012; Sagkal, Topçu Kabasakal and Turnuklu, 2015), there is still absence of a scale to be used in pre-service teacher training classrooms in Turkish literature. When these diverse scales were considered, it can be stated that none of these instruments have been developed to be used in pre-service teacher education classes in Turkish context. Hence, in the current study, a classroom environment scale was developed to investigate the classroom environment perceptions of pre-service teachers.

The Aim of the Study and Research Question

The purpose of this research study was to develop a classroom environment scale for assessing pre-service teachers' classroom environment perceptions and investigate its validity and reliability. The following research question was proposed based on the purpose of the study:

1. Is the Classroom Environment Perceptions Scale of Pre-Service Teachers (CEPSPT) valid and reliable?

Method

In this part, research design, paticipants of the study, data collection instrument and procedures and data analysis were presented.

Research Model

This study was based on survey research design. Survey research designs report the characteristics of one sample which has been drawn from a pre-determined population at just one point in time (Fraenkel and Wallen, 2009; Gall, Gall and Borg, 2003). In this way, they describe the characteristics of the population (Creswell, 2012). As stated by Cohen, Manion, and Morrison (2007) survey research designs include wide populations to measure and describe any generalized features.

Study Group

In the study participants were chosen according to convenience sampling method. Convenience sampling involves choosing the sample from those to whom they have easy access or those who are available and accessible at the time (Cohen et

all., 2007). Moreover, Gall, et all. (2003) stated that researchers select a sample that suits the purposes of the study.

In this study, 528 pre-service teachers were included for the exploratory factor analysis. After eliminating eight questionnaires because of unanswered items, a total of 520 questionnaires were included for the analysis. Among the 520 pre-service teachers, 314 (60.38 %) of them were female and 206 (39.62 %) of them were male and 251 (48.27 %) of them from Uşak University; 239 (45.96 %) of them from Ege University and 30 (5.77 %) of them from Manisa Celal Bayar University. Also, 280 sophomore pre-service teachers were included in the study from Manisa Celal Bayar University for the confirmatory factor analysis. Among the 280 pre-service teachers, 201 (71.79 %) of them were female and 79 (28.21 %) of them were male. The distribution of pre-service teachers for the analyses across their departments can be seen in Table 1.

Table 1

The Distribution of Participants across the Departments

	Departments	**f**	**%**
EFA	Guidance and Psychological Counseling	136	26.15
	Classroom Teaching	57	10.96
	Science Teaching	44	8.46
	Social Sciences	49	9.42
	Elementary School Mathematics Teaching	33	6.35
	Computer and Instructional Technologies Teaching	71	13.66
	Pre-school Teaching	52	10.00
	Turkish Language Teaching	78	15.00
Total		520	100
CFA	Classroom Teaching	77	27.50
	Turkish Language Teaching	85	30.36
	Science Teaching	69	24.64
	Elementary School Mathematics Teaching	49	17.50
Total		280	100

Data Collection Tool and Procedures

In this study, many classroom environment instruments across various grade levels, subjects, and also for specific classroom contexts in many countries were investigated by conducting a thorough literature review related to psychosocial learning environment instruments. Then this process proceeded with item generation.

The scale was developed in accordance with the constructivism, environment congruence theory, flipped classroom principles and also the studies of Fraser and his colleagues (Coll et all., 2002; Fraser, 1980; Fraser, Anderson et all., 1982; Fraser and Treagust, 1986; Rentoul and Fraser, 1980; Taylor et all., 1997; Trickett and Moos, 1973; Trinidad, Aldridge, and Fraser, 2005) by adapting some items and writing new

items. In this study, expert opinions were taken from seven faculty members in the Curriculum and Instruction Department of Ege, Hacettepe, Iowa State and Middle East Technical Universities in terms of the face validity i.e. about the clarity, readability of items, properness of items to the sub-scales, physical layout of the instrument and the order of sub-scales. For instance, one of the experts suggested that the item 33 *Good friendships are established among the students in different groups* which was written in the *cooperation* sub-scale should be appropriate for *student cohesiveness* sub-scale. Moreover, one research assistant from Turkish Language Teaching Department examined the scale in terms of grammar and clarity of sentences. Then, the scale was administered to seven pre-service teachers in order to review the instrument in terms of openness, directness, clarity and readability of instructions and items.

Based on the suggestions of experts and students, necessary revisions were conducted and the pilot form of the CEPSPT included both positive and negative statements and consisted of two parts. The first part involved demographic information and the second part included 60 items, 5 point Likert type (ranging from 1 = completely disagree to 5 = completely agree).

The scale was developed by including Moos' (1974) three general categories to present a through profile of the psychosocial classroom environment. It consisted of *Involvement*, *Innovation*, *Student Cohesiveness*, *Cooperation*, *Individualization*, *Satisfaction*, *Task Orientation*, *Democracy* and *Difficulty* sub-scales. These sub-scales had 17, 3, 7, 7, 3, 4, 8, 4, 7 items respectively. The relationship dimension included student cohesiveness and involvement aspects of classroom environment; personal development dimension included investigation, task orientation and cooperation aspects and finally, system maintenance and system change dimension of classroom environment included innovation, democracy and individualization aspects. The items 1, 3, 7, 9, 12, 13, 16, 17, 19, 20, 25, 26, 33, 34, 40, 44, 50, 52, 54, 57, 59 were negatively constructed.

After EFA, by conducting CFA the factor structure of the CEPSPT was confirmed. The data collection process for EFA started in May and was completed in June in 2016-2017 education year spring semester. Pre-service teachers who were sophomores and took the Principles and Methods of Instruction course in 2016-2017 education year spring semester filled out the CEPSPT. Sophomore pre-service teachers who took the Principles and Methods of Instruction course in the fall semester of 2017-2018 academic year were included for CFA. They filled out the CEPSPT from the end of the December to the beginning of the January. Pre-service teachers needed 10-15 minutes to fill out the scale.

Data Analysis

EFA was implemented in order to determine the underlying factors of the CEPSPT. Oblique rotation was employed because the factors of the scale are likely to correlate with each other. The Bartlett test result and KMO coefficient were

determined to investigate the appropriateness of data for factor analysis. Data analyses concerning construct validity was conducted using SPSS 22.0.

Before the analysis, firstly, data were screened in terms of data entry and missing values. Also, negatively constructed items were recoded into different variables. Then univariate, multivariate outliers and influential outliers were checked (Hair, Black, Babin, and Anderson, 2014) and it was seen that there were no undue influence over the regression parameter.

In addition to these, linearity, univariate normality assumptions were checked and seen that these assumptions were met (Tabachnick and Fidell, 2007). Moreover, multicollinearity assumption was examined by inspecting variance inflation factors (VIF) and tolerance values. It was determined that correlation coefficients were below .90, tolerance values were not higher than than .10, and VIFs were below 10 (Field, 2009). Hence, it can be said that the multicollinearity assumption was not violated.

Furthermore, Mardia's test was used in order to examine multivariate normality, and it was determined that multivariate normality was violated. Hence, the Principle Axis Factoring (PAF) extraction method was employed which was more appropriate than Maximum likelihood factor method when the multivariate normality was violated (Field, 2009). CFA was conducted using Lisrel 8.8 and the model fit was evaluated and fit indices were stated (Hair et all., 2014). Finally Cronbach's Alpha coefficients of internal consistency was examined in order to test the reliability of the scale.

Results

In this part, results which were obtained from EFA, CFA and the reliability of CEPSPT were presented.

Exploratory Factor Analysis (EFA)

Firstly, KMO statistics which is the measure of sampling adequacy was checked in order to assess the validity of the CEPSPT. It should vary between 0 and 1 (Field, 2009). The KMO value of this data set is .92 and according to criteria stated by Kaiser (1974) values above .90 are superb (as cited in Field, 2009). Hence, it can be stated that sample size is adequate in order to conduct analyses.

Moreover, there should be correlations among variables and they should be above 0.30 at the correlation matrix. In the data set, there were correlations below 0.30; however, even very small correlations may be very significant with large sample size (Tabachnick and Fidell, 2007). In this respect, Bartlett's test was conducted (Field, 2009). Bartlett's test was significant (χ^2_{741} = 7778.47, p<.000). Thus, by examining the correlation matrix and the Bartlett's test results, it can be said that there are some relationships between the variables. As a result, it can be said that the data are appropriate to conduct factor analysis.

EFA was executed using PAF extraction method and promax rotation, items 1, 3, 7, 14, 18, 35, 36, 37, 42, 48, 50, 52, 53, 57, 59 were removed from the scale because

their factor loadings were less than 0.30 or they were cross-loaded. Also, some items formed a 2-item factor like items 9 and 43, items 19 and 20, items 33 and 34. Hence, they were removed from the analysis (see Appendix B for the remaining items). While determining the number of factors, factors with eigenvalues greater than one was considered and scree plot was checked. According to the last analysis, seven eigenvalues were found higher than one. However, it was observed that one factor was distributed to two factors. Hence, before conducting the analysis again the factor structure was pre-determined as six. The scree plot of EFA was shown in Figure 1.

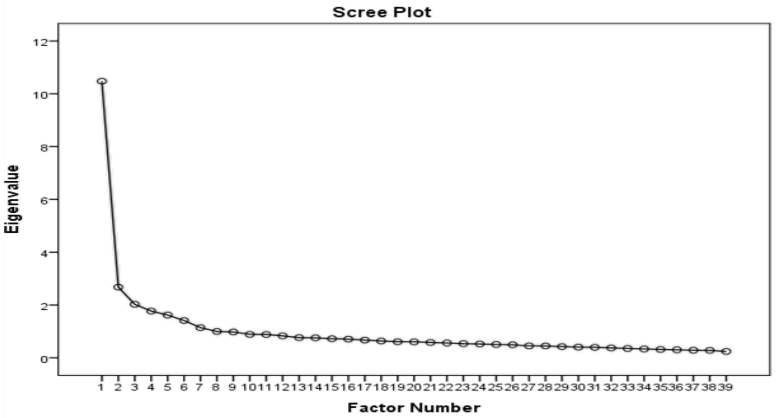

Figure 1. Scree plot for CEPSPT

According to Field (2009), factors with large eigenvalues should be retained. Hence, by examining theoretical structure, besides scree plot (factors with sharp descents in the curve followed by a tailing off) six factors were retained. According to Table 2, 1st, 2nd, 3rd, 4th, 5th and 6th factors explained 26.87 %, 6.86 %, 5.19 %, 4.54 %, 4.15 % and 3.62 % of the variances respectively. These six factors (sub-scales) explained 51.2 % variance. Moreover, the eigenvalues of different sub-scales varied from 10.48 to 1.41.

Table 2

Eigenvalues, Percentages of Variance and Cumulative Percentages for Sub-Scales of CEPSPT

Sub-Scales	Eigenvalue	% of Variance	Cumulative %
1	10.48	26.87	26.87
2	2.67	6.86	33.73
3	2.03	5.19	38.92
4	1.77	4.54	43.46
5	1.62	4.15	47.61
6	1.41	3.62	51.23

The pattern matrix was checked and the items whose factor loadings greater than 0.30 were considered (Field, 2009; Stevens, 2009). They were statistically significant at p = .001 level, which indicates that each item significantly contributed to the corresponding sub-scale. The factor loadings for the CEPSPT were shown in Table 3.

Table 3

Factor Loadings for the CEPSPT (N = 520)

	Factors					
Items	**1**	**2**	**3**	**4**	**5**	**6**
M2	.13	-.01	**.48**	-.01	.06	-.15
M4	.13	.18	**.50**	-.10	-.05	-.12
M5	.07	.11	**.57**	-.07	-.10	-.09
M6	.05	.03	**.50**	.08	.12	.14
M8	**.52**	.04	.32	.00	-.04	-.08
M10	.03	-.02	**.55**	.07	-.01	-.06
M11	.12	-.01	**.48**	.13	-.02	-.01
M15	.09	.01	**.41**	.21	.09	.05
M21	.08	.04	.05	.07	**.55**	-.14
M22	.17	-.02	-.02	.14	**.67**	-.07
M23	.02	.25	-.06	.03	**.63**	-.14
M24	.03	**.51**	-.09	.03	.23	.02
M27	.09	**.51**	-.12	-.05	.11	-.09
M28	-.05	**.71**	.07	-.04	-.02	.02
M29	.11	**.81**	.12	-.06	.01	.12
M30	.15	**.62**	.23	.06	-.03	.15
M31	.08	**.68**	.02	-.05	-.02	-.03
M32	.07	**.54**	.11	.12	-.06	-.02
M38	**.63**	.28	-.28	.11	-.12	-.09
M39	**.50**	.27	-.05	.11	-.08	-.01
M41	**.43**	.11	-.03	.07	-.05	-.14
M45	.06	.11	.12	**.54**	-.05	.02
M46	.18	-.05	.05	**.72**	.10	.05
M47	.07	-.09	.03	**.80**	-.01	.06
M49	.22	-.00	-.09	**.69**	.01	-.08
M51	.06	.15	.02	**.48**	.04	.00
M55	.13	.00	.11	.01	.02	**-.63**
M56	.00	-.08	.18	.04	-.01	**-.67**
M58	.09	.07	-.12	-.07	.11	**-.60**
M60	.13	-.14	.06	.02	.10	**-.57**
M12S	**.54**	-.07	.17	-.10	-.02	.04
M13S	**.60**	-.12	.05	.06	-.04	.15
M16S	**.54**	.02	.22	-.11	.14	.04
M17S	**.65**	-.09	.09	.01	.05	.11
M25S	.06	-.09	.02	-.04	**.61**	.11
M26S	.20	.11	-.01	-.18	**.53**	.18

(continued)

Table 3 (continue)

	Factors					
Items	**1**	**2**	**3**	**4**	**5**	**6**
M40S	**.45**	-.01	-.02	.07	.05	.14
M44S	**.59**	-.20	.09	-.04	.08	.01
M54S	.01	-.08	-.06	.14	.18	**.38**
	Factor Correlations					
	(1)	(2)	(3)	(4)	(5)	(6)
Factor1 (1)	1.00					
Factor2 (2)	.53	1.00				
Factor3 (3)	.55	.55	1.00			
Factor4 (4)	.46	.52	.54	1.00		
Factor5 (5)	.43	.49	.52	.42	1.00	
Factor6 (6)	.35	.13	.27	.24	.30	1.00

According to Table 3, items 8, 12, 13, 16, 17, 38, 39, 40, 41, 44 were loaded to the 1st factor. The factor loadings of 1st sub-scale ranged from .43 to .65. These items are about whether the students enjoy class work or not. Therefore, the 1st factor was named as *Satisfaction*. Items 24, 27, 28, 29, 30, 31 and 32 were loaded to the 2nd factor. The factor loadings of 2nd sub-scale ranged from .51 to .81. These items are about whether students cooperate with one another while they are learning. Hence, the 2nd factor was named as *Cooperation*. Items 2, 4, 5, 6, 10, 11 and 15 were loaded to the 3rd factor. The factor loadings of 3rd sub-scale ranged from .41 to .57. These items are about whether students are interested in the course and participate in class discussions, and do additional studies after the class for deep learning. Therefore, the 3rd factor was named as *Involvement*. In addition, items 45, 46, 47, 49 and 51 were loaded to the 4th factor. The factor loadings of 4th sub-scale ranged from .48 to .80. These items are about completing planned activities and work on the assigned task. Hence, the 4th factor was named as *Task Orientation*. The items 21, 22, 23, 25 and 26 were loaded to the 5th factor. The factor loadings of 5th sub-scale ranged from .53 to .67. These items are about whether students know each other, help while conducting in class tasks and support each other whenever it is necessary. Hence, the 5th factor was named as *Student Cohesiveness*. Finally, the items 54, 55, 56, 58 and 60 were loaded to the 6th factor. The factor loadings of 6th sub-scale ranged from .38 to .67. These items are about whether students find the class work hard or not. Hence, the 6th factor was named as *Difficulty*.

The factor loadings of the current data set with 520 participants were greater than 0.38 which was enough as stated by Stevens (2009) and Field, 2009. Moreover, the difference between factor loadings of two factor were greater than 0.15. Hence, it can be said that a good factor structure was obtained.

As a result, although the first form of CEPSPT included *involvement*, *innovation*, *student cohesiveness, cooperation*, *individualization*, *satisfaction*, *task orientation*, *democracy* and *difficulty* sub-scales, after analysis, *individualization*, *democracy* and

innovation sub-scales were disappeared from the CEPSPT because of low factor loadings or cross-loadings.

Confirmatory Factor Analysis (CFA)

CFA was conducted using the Maximum Likelihood estimation method with robust standard errors (MLR). In order to examine the model fit, model chi-square, CFI (Comparative Fit Index), GFI (Goodness of Fit Index), IFI (Incremental Fit Index), NFI (Normed Fit Index), NNFI (Non-Normed Fit Index) and RMSEA (Root Mean Square Error of Approximation) were checked as stated by Hair et all. (2014). In the current study, MLR was used because multivariate normality assumptions was not met and CFA proposed the following model fit indices: χ^2_{650} = 1281.19, p < .000, RMSEA = .059, CFI = .97, NFI = .94, NNFI = .97, IFI = .97, RFI = .93 which were above the acceptable model fit indice .90. However, GFI = .81, for GFI the acceptable model fit indice is 0.85 or above (Tabachnick and Fidell, 2007). Moreover, the acceptable values for RMSEA are between .05 and .08 (Hair et all., 2014). Finally, a last fit statistics is the normed χ^2 which is calculated by dividing the value of χ^2 to the value of degrees of freedom. According to the Hair et all. (2014), the values smaller than 2 are considered very good. In the current data set, the value of χ^2/df = 1.93 (p < .000) is less than 2 which indicates a good fitting statistics. However, since it was significant, other goodness of fit indices were checked. The other goodness of fit indices were above the acceptable values except GFI as stated by Hair et all. (2014). Then, modification indices were checked.

CFA was re-run and modifications were conducted to improve model fit among item pairs 30 and 31 with higher error covariances. Items 30 and 31 were belong to the same construct, which was the fifth sub-scale of CEPSPT. Item 30 is *Students know each other well in this class* whereas item 31 is *Each student knows the names of other students in class*. They are theoretically connected to each other. Afterwards, CFA was re-run, and a modification was also conducted to improve model fit among item pairs 1 and 6 with higher error covariances. Items 1 and 6 were also the items of the same sub-scale, which is the first sub-scale of CEPSPT. Item 1 is *Students are willing to attend the class* whereas item 6 is about *Students look forward to coming to this course*. They were theoretically connected to each other.

After conducting modifications, CFA proposed the following model fit indices: χ^2_{648} = 1214.74, p < .000, RMSEA = .056, CFI = .97, NFI = .94, NNFI = .97, IFI = .97, RFI = .94, and GFI = .81. The value of χ^2/df = 1.87 (p < .000) is less than 2 which indicates a good fitting statistics. Since it was significant, other goodness of fit indices were checked. The model fit values indicated superb fit except GFI which is also close to expected value. In Figure 2, six-factor model of the CEPSPT and its standardized path coefficients can be seen. The standardized path coefficients ranged from 0.34 for item 28 to 0.88 for item 9.

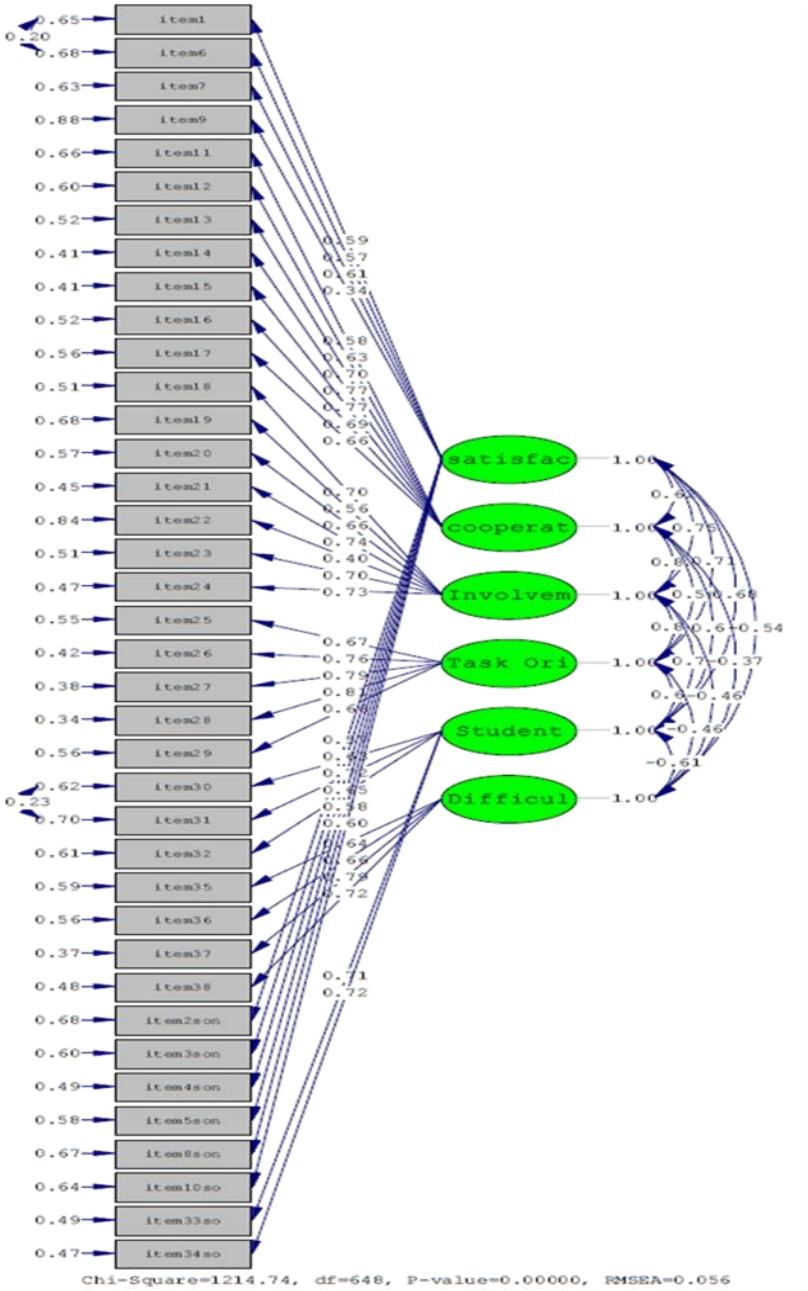

Figure 2. Standardized path coefficients for six-factor model of CEPSPT.

Table 4

The Item Numbers across the Factors of the CEPSPT

Factors-Sub-Scales	Item Numbers
1. Satisfaction	8, 12, 13, 16, 17, 38, 39, 40, 41, 44
2. Cooperation	24, 27, 28, 29, 30, 31, 32
3. Involvement	2, 4, 5, 6, 10, 11, 15
4. Student Cohesiveness	45, 46, 47, 49, 51
5. Task Orientation	21, 22, 23, 25, 26
6. Difficulty	55, 56, 58, 60

Finally, as shown in Table 4, the CEPSPT consisted of six sub-scales. Satisfaction sub-scale consisted of 10 items (e.g., Students look forward to coming to this course), Cooperation sub-scale consisted of 7 items (e.g., Each student tries to fulfill his/her duties fully in individual or group works), Involvement sub-scale included 7 items (e.g., Students strive to complete the activities that are being conducted in class), Task Orientation sub-scale included 5 items (e.g., The learning tasks are planned clearly and carefully), Student Cohesiveness sub-scale consisted of 5 items (e.g., Students know each other well), and Difficulty sub-scale included 4 items (e.g., Students are challenged in group work conducted in class.).

Reliability of the CEPSPT

In the current study, the reliability coefficient was found .85 for Satisfaction, .84 for Cooperation, .77 for Involvement, .83 for Task Orientation, .77 for Student Cohesiveness, and .44 for Difficulty sub-scales. However, one item of difficulty scale, item 54, indicated a higher Cronbach's alpha if item deleted. Hence, when the item 54 was removed from the scale, the reliability of the Difficulty sub-scale raised to .72 which shows adequate convergence or internal consistency (Hair, et all., 2014). Moreover, the reliability coefficient of the scale as a whole was also calculated .91. The reliability coeficients across the sub-scales of CEPSPT were shown in Table 5.

Table 5

Reliability Coefficients for the Sub-Scales of the CEPSPT

Sub-Scales	Reliability Coefficients
1. Satisfaction	.85
2. Cooperation	.84
3. Involvement	.77
4. Student Cohesiveness	.77
5. Task Orientation	.83
6. Difficulty	.72

Discussion, Conclusion and Suggestions

The purpose of this research study was to develop a classroom environment scale for assessing pre-service teachers' classroom environment perceptions and investigate its validity and reliability. Data were analyzed using SPSS 22 and Lisrel 8.8. EFA and CFA were applied to test construct validity of the CEPSPT. The CEPSPT included 38-item 5-point (ranging from 1-completely disagree to 5-completely agree) Likert scale and consisted of six sub-scales: 1. Satisfaction, 2. Cooperation, 3. Involvement, 4. Student Cohesiveness, 5. Task Orientation, and 6. Difficulty.

The CEPSPT was developed as a valid and reliable. The reliability coefficients were greater than .70 as determined by Nunnally (1978 as cited in Field, 2009). Since according to Tabachnick and Fidell (2007), the reliability of factors is dependent on sample size, it is comforting to have 300 cases for factor analysis. Thus, it was enough in the current study.

While developing CEPSPT, the existing instruments were examined. Although factors of the CEPSPT were similar to the previously developed classroom environment instruments, there were some important differences. Although some of the sub-scales were included in the CEPSPT, some items were removed and some items were newly written. First of all, the sub-scale *personalization* is included in the CUCEI, was not included in the CEPSPT. It was thought that the classes of education faculties might emphasize cooperation and collaboration instead of personal properties of students. In addition to these, the *difficulty* sub-scale which is included in CEPSPT was not included in CUCEI. While developing the CEPSPT, it is thought that classroom environment perceptions of students is context dependent and students in different classrooms like constructivist, flipped and tradition classrooms may perceive the classroom in varying difficulties which can affect their levels of achievement. Moreover, WIHIC includes *teacher support*, *investigation*, *equity* sub-scales which were not included in CEPSPT. For example, as also stated by Charalampous and Kokkinos (2017) the *investigation* sub-scale requires inquiry and problem solving abilities which was thought to be more appropriate for science classrooms rather than the teacher training classes.

In addition to these, the first form of CEPSPT included Moos' (1974) three general categories to present a comprehensive classroom environment profile. However, after analysis, some items of *individualization*, *democracy* and *innovation* sub-scales were disappeared from the CEPSPT because of low factor loadings or cross-loadings. For example, an item from *innovation* sub-scale included *Instructor organizes different activities than the students are accustomed to*. This item was cross-loaded to both *innovation* and *involvement* sub-scales. Hence, it was excluded from the scale. Similarly, in the study conducted by Chapman (2012), WIHIC was implemented to 512 5^{th}-8^{th} graders in Georgia by combining student cohesiveness and cooperation sub-scales, as well as the involvement and investigation sub-scales by rewording several items. Factor analysis resulted in removing more items and the exclusion of student cohesiveness-cooperation sub-scale. Also, Coll et all. (2002)

confirmed the reliability of CUCEI for only two sub-scales (satisfaction and cohesiveness) when it was implemented to a culturally diverse university students in the Pacific Islands for whom the English was a second or third language. Thus, it can be said that perception of classroom environment may differ according to the grade level, attitude of teachers and different cultures.

In the current study, pre-sevice teachers were selected from three universities located in Aegean region which may be one of the limitations of this study. It is suggested that the factor structure of this scale should be checked with a larger sample by including pre-service teachers from different regions in Turkey.

Finally, construct validity and the internal consistency of the CEPSPT was determined. Researchers can use this classroom environment scale in order to assess the perceptions of pre-service teachers in different classroom environments like online, flipped or traditional. Also, researchers can investigate the relationships among classroom environment perceptions of pre-service teachers and different cognitive and affective outcomes by using this instrument. In this way, pre-service teachers' learning and experiences related to different classroom environments might be improved by providing them with proper classroom environments.

References

Afari, E., Aldridge, J. M., Fraser, B. J., and Khine, M. S. (2013). Students' perceptions of the learning environment and attitudes in game-based mathematics classrooms. *Learning Environments Research, 16,* 131-150. doi: 10.1007/s10984-012-9122-6

Aldridge, J. M., and Fraser, B. J. (2000). A cross-cultural study of classroom learning environments in Australia and Taiwan. *Learning Environments Research, 3*(2), 101-134.

Arısoy, N. (2007). *Examining 8th grade students' perception of learning environment of science classrooms in relation to motivational beliefs and attitudes* (Unpublished master's thesis, Middle East Technical University, Graduate School of Social Sciences, Ankara, Turkey). Retrieved from https://tez.yok.gov.tr/UlusalTezMerkezi/. (Thesis No. 218043)

Atbas, E. E. (2004). *The effect of students' entering characteristics and classroom environment experiences on their language learning outcomes in an efl setting in Turkey* (Unpublished doctoral dissertation, Middle East Technical University, Graduate School of Social Sciences, Ankara, Turkey). Retrieved from https://tez.yok.gov.tr/UlusalTezMerkezi/. (Thesis No. 147641)

Ben-Chaim, D., Fresko, B., and Carmeli, M. (1990). Comparison of teacher and pupil perceptions of the learning environment in mathematics classes. *Educational Studies in Mathematics, 21*(5), 415-429. doi: 10.1007/BF00398861

Chapman, F. (2012). *Use of exchange-of-knowledge method for enhancing classroom environment and students' attitudes and achievements in Mathematics*. (Doctoral dissertation). Retrieved from https://tinyurl.com/yc9h3387

Charalampous, K., and Kokkinos, C., M. (2017). The what is happening in this class questionnaire: A qualitative examination in elementary classrooms. *Journal of Research in Childhood Education, 31*(3), 379-400. doi: 10.1080/02568543.2017.1310153

Chavez, R. C. (1984). The use of high inference measures to study classroom environments: A review. *Review of Educational Research, 54*(2), 237-261.

Chien, C. F. (2007). *Development, validation and use of an instrument for assessing business management learning environments in higher education in Australia: The business management education learning environment inventory (BMELEI)* (Doctoral dissertation). Retrieved from https://espace.curtin.edu.au/bitstream/handle/20.500.11937/1095/17957_Chien, Chee.pdf?sequence=2.

Chionh, Y. H., and Fraser, B. J. (2009). Classroom environment, achievement, attitudes and self esteem in geography and mathematics in Singapore. *International Research in Geographical and Environmental Education, 18*(1), 29-44. doi: 10.1080/10382040802591530

Cohen, L., Manion, L., and Morrison, K. (2007). *Research methods in education* (6th Ed.). New York, NY: Routledge.

Coll, R. K., Taylor, N., and Fisher, D. L. (2002). An application of the questionnaire on teacher interaction and college and university classroom environment inventory in a multicultural tertiary context. *Research in Science & Technological Education, 20*(2), 165-183. doi: 10.1080/0263514022000030435

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Boston, Massachusetts, MA: Pearson.

Cubukcu, Z. (2012). Teachers' evaluation of student-centered learning environments. *Education, 133*(1), 49-55. Retrieved from https://tinyurl.com/yd3ugnrb

Davies, R. S., Dean, D. L., and Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educational Technology Research and Development, 61*(4), 563-580. doi: 10.1007/s11423-013-9305-6

den Brok, P., Fisher, D., and Scott, R. (2005). The importance of teacher interpersonal behaviour for student attitudes in Brunei primary science classes. *International Journal of Science Education, 27*(7), 765-779. doi: 10.1080/09500690500038488

Dorman, J. P., Adams, J. D., and Ferguson, J. M. (2003). A cross-national investigation of students' perceptions of mathematics classroom environment and academic efficacy in secondary schools. *International Journal for Mathematics Teaching and Learning.* Retrieved from http://www.cimt.org.uk/journal/dormanj.pdf

Field, A. P. (2009). *Discovering statistics using spss*. (3th Ed.). London: SAGE Publications.

Fraenkel, J. R., and Wallen, N. E. (2009). *How to design and evaluate research in education* (7th ed.). New York, NY: McGraw Hill.

Fraser, B. J. (1980). *Criterion validity of an individualized classroom environment questionnaire.* Retrieved from https://files.eric.ed.gov/fulltext/ED214961.pdf

Fraser, B. J. (1986). *Classroom environment.* London: Croom Helm.

Fraser, B. J. (1987). Classroom learning environments and effective schooling. *Professional School Psychology, 2*(1), 25-41. doi: 10.1037/h0090526

Fraser, B. J. (1998). Classroom environment instruments: Development, validity, and applications. *Learning Environments Research, 1*(1), 7-33. doi:10.1023/A:1009932514731

Fraser, B. J., Anderson, G. J., and Walberg, H.J. (1982). *Assessment of learning environment: Manual for learning environment inventory, (LEI) and my class inventory (MCI)* (3rd version). Perth: Western Australian Institute of Technology. Retrieved from https://files.eric.ed.gov/fulltext/ED223649.pdf

Fraser, B. J., Giddings, G. J., and McRobbie, C. J. (1992). Assessment of the psychosocial environment of university science laboratory classrooms: A cross-national study. *Higher Education, 24*, 431-451.

Fraser, B. J., McRobbie, C. J., and Fisher, D. (1996, November). *Development, validation and use of personal and class forms of a new classroom environment questionnaire*. Paper presented at the Conference of the Educational Research Association, Singapore and the Australian Association of Research in Education, Singapore.

Fraser, B. J., Pearse, R., and Azmi (1982). A study of Indonesian students' perceptions of classroom psychosocial environment. *International Review of Education, 28,* 337-355.

Fraser, B. J., and Treagust, D. F. (1986). Validity and use of an instrument for assessing classroom psychosocial environment in higher education. *Higher Education, 15*, 37-57.

Fresko, B., Carmeli, M., and Ben-Chaim, D. (1989). Teacher credentials and other variables as predictors of the mathematics classroom learning environment. *The Journal of Educational Research, 83*(1), 40-45.

Gall, M. D., Gall, J. P., and Borg, W. R. (2003). *Educational research: An introduction*(7th ed.). Boston, Massachusetts, MA: Allyn-Bacon.

Goh, S. C., and Fraser, B. J. (1998). Teacher interpersonal behaviour, classroom environment and student outcomes in primary mathematics in Singapore. Learning Environments Research *1*, 199–229. Retrieved from https://doi.org/10.1023/A:1009910017400

Goh, S. C., and Fraser, B. J. (2000). Teacher interpersonal behavior and elementary students' outcomes. *Journal of Research in Childhood Education, 14*(2), 216-231. doi: 10.1080/02568540009594765

Haertel, G. D., Walberg, H.J., and Haertel, E. H. (1981). Socio-psychological environments and learning: A quantitative synthesis. *British Educational Research Journal, 7*(1), 27-36. doi: 10.1080/0141192810070103

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). London: Pearson New International Edition.

Kesal, F. (2003). *An investigation on constructivist classroom characteristics in ELT methodology II course* (Unpublished doctoral dissertation, Middle East Technical University, Graduate School of Social Sciences, Ankara, Turkey). Retrieved from https://tez.yok.gov.tr/UlusalTezMerkezi/. (Thesis No. 140272)

Kucukozer, H., Kirtak-Ad, V. N., Ayverdi, L., and Egdir, S. (2012). Turkish adaptation of constructivist learning environment survey. *Elementary Education Online, 11*(3), 671-688.

LaRocque, M. (2008). Assessing perceptions of the environment in elementary classrooms: The link with achievement. *Educational Psychology in Practice, 24*(4), 289-305. doi: 10.1080/02667360802488732

McRobbie, C. J., Roth, W. M., and Lucus, K. B. (1997). Multiple learning environments in the physics classroom. *International Journal of Educational Research, 27*(4), 333-342. doi: 10.1016/S0883-0355(97)90015-X

Moos, R. H. (1974). The Social Climate Scales: An Overview. Palo Alto, California CA: Consulting Psychologists Press.

O'Reilly, R. (1975). *Classroom climate and achievement in secondary school mathematics classes*. Retrieved from https://files.eric.ed.gov/fulltext/ED101473.pdf

Ozkok, A., Yurdugül, H., and Askar, P. (2011). An examination of the factor structure of the Turkish version of the online learning environment survey. *Education and Science 36*(161), 159-175. Retrieved from https://tinyurl.com/ydcdup4q

Rentoul, A. J., and Fraser, B. J. (1980). Predicting learning from classroom individualization and actual-preferred congruence. *Studies in Educational Evaluation, 6(3),* 265-277. doi: 10.1016/0191-491X(80)90029-2

Roth, W. M. (1998). Teacher-as-researcher reform: Student achievement and perceptions of learning environment. *Learning Environments Research, 1*(1), 75–93.

Sagkal, A. S., Topcu-Kabasakal, Z., and Türnüklü, A. (2015). Turkish adaptation of the connected classroom climate inventory (CCCI). *Elementary Education Online, 14*(4), 1179-1192.

Sams, A., and Bergmann, J. (2013). Flip your students' learning. *Educational Leadership, 70*(6), 16-20. Retrieved from https://tinyurl.com/bssk349

Strayer, J. (2007). *The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system* (Doctoral dissertation). Retrieved from https://etd.ohiolink.edu/!etd.send_file?accession=osu1189523914&disposition=attachment.

Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (5th Ed.). Hillsdale, New Jersey, NJ: Routledge.

Tabachnick, B. G., and Fidell, L. S. (2007). *Using multivariate statistics* (6th Ed.). Boston, Massachusetts, MA: Pearson Education Inc.

Taylor, P. C., Fraser, B. J., and Fisher, D. L. (1997). Monitoring constructivist classroom learning environments. *International Journal of Educational Research*, 27(4), 293-302.

Teh, G. P. L., and Fraser, B. J. (1995). Development and validation of an instrument for assessing the psychosocial environment of computer-assisted learning classrooms. *Journal of Educational Computing Research, 12*(2), 177-193.

Trickett, E. J., and Moos, R. H. (1973). Social environment of junior high and high school classrooms. *Journal of Educational Psychology, 65*(1), 93-102.

Trinidad, S., Aldridge J., and Fraser, B. (2005). Development, validation and use of the online learning environment survey. *Australasian Journal of Educational Technology, 21*(1), 60-81.

Walberg, H. J., and Anderson, G. J. (1968). Classroom climate and individual learning. *Journal of Educational Psychology, 59*(6), 414-419. doi: 10.1037/h0026490

Wang, M. T. (2012). Educational and career interests in math: A longitudinal examination of the links between perceived classroom environment, motivational beliefs, and interests. *Developmental Psychology, 48*(6), 1643-1657.

Velayutham, S., and Aldridge, J. M. (2013). Influence of psychosocial classroom environment on students' motivation and self-regulation in science learning: A structural equation modelling approach. *Research in Science Education, 43,* 507–527. doi: 10.1007/s11165-011-9273-y.

Yin, H., and Lu, G. (2014). Development and validation of an instrument for assessing mathematics classroom environment in tertiary institutions. *Asia-Pacific Edu Res, 23*(3), 655–669. doi: 10.1007/s40299-013-0138-1

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Öğretmen Adaylarına Yönelik Sınıf Ortamı Algıları Ölçeğinin Geliştirilmesi[1]

MAKALE TÜRÜ	Başvuru Tarihi	Kabul Tarihi	Yayın Tarihi
Araştırma Makalesi	26.11.2018	09.06.2019	04.10.2019

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Öz

Bu araştırmanın amacı, öğretmen adaylarının psikososyal öğrenme ortamına ilişkin algılarını değerlendirmek için bir sınıf ortamı algıları ölçeği geliştirmektir. Bu çalışmada öncelikle psikososyal öğrenme ortamı araçları ile ilgili kapsamlı bir alanyazın taraması yapılmıştır. Ölçek, yapılandırmacılık, çevre uyum kuramı ile Fraser ve meslektaşlarının çalışmalarına uygun olarak geliştirilmiştir. Öğretmen Adaylarının Sınıf Ortamı Algıları Ölçeği'nin pilot formu, Moos'un (1974) ilişki, kişisel gelişim ile sistem bakım ve sistem değişimi boyutlarına uygun olarak 60 maddeyi içermiştir. 2016-2017 öğretim yılı bahar döneminde, açımlayıcı faktör analizi (AFA) için 520 öğretmen adayı ve 2017-2018 eğitim-öğretim yılı güz döneminde, doğrulayıcı faktör analizi (DFA) için 280 ikinci sınıf öğretmen adayı çalışmaya katılmıştır. AFA, Temel Eksen Faktörler Analizi ve promax rotasyon tekniği kullanılarak gerçekleştirilmiştir. Ölçeğin faktör yapısı DFA ile doğrulanmıştır. Modifikasyonlardan sonra, kabul edilebilir model uyum indeksleri elde edilmiştir. Faktörlerin güvenirlik katsayısı .72 ve .85 arasında değişmektedir. Son olarak, geçerliği ve güvenirliği çalışılarak ölçeğin, 38 maddeden oluşan, 5'li likert tipinde Memnuniyet, İşbirliği, Katılım, Görev Yönelimi, Öğrenci Bağlılığı ve Zorluk olmak üzere altı alt-ölçekten oluştuğu belirlenmiştir.

Anahtar sözcükler: Sınıf ortamı, faktör analizi, ölçek geliştirme, öğretmen adayları, psikososyal öğrenme ortamı.

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Amaç ve Önem

Bu araştırmanın amacı, öğretmen adaylarının psikososyal öğrenme ortamına ilişkin algılarını değerlendirmek için bir sınıf ortamı algıları ölçeği geliştirmektir. Araştırmanın amacına dayanarak aşağıdaki araştırma sorusu önerilmiştir:

Öğretmen Adaylarının Sınıf Ortamı Algıları Ölçeği geçerli ve güvenilir midir?

Öğrencilerin eğitim ortamlarına getirdikleri bilişsel ve demografik özelliklerin yanı sıra sınıf ortamının psikososyal yönleri de önemlidir. Fraser'a (1986, s. 1) göre *sınıf ortamı* ortamdaki öğrenci ve öğretmenlerin ortak algıları olarak tanımlanmaktadır. Bu çalışmanın yapılmasının nedenlerinden biri olarak sınıf ortamları kapsamlı bir şekilde değerlendirilmeden, eğitimde tam verimliliğin sağlanamayabileceği düşüncesi bulunmaktadır.

Alanyazında farklı sınıf düzeyleri ve amaçlar için geliştirilmiş temel sınıf ortamı algıları ölçekleri bulunmaktadır (Benim Sınıfım Envanteri-MCI, Öğrenme Ortamı Envanteri-LEI, Kolej ve Üniversite Sınıf Ortamı Envanteri-CUCEI, Bu Sınıfta Neler Oluyor Ölçeği-WIHIC, Yapılandırmacı Öğrenme Ortamı Ölçeği-CLES). Belirtilen ölçekler, farklı bağlamlarda ve sınıf düzeylerinde birçok araştırma çalışması için uyarlanmış veya değiştirilmiştir. Örneğin, LEI, MCI'nın basitleştirilmiş versiyonudur. LEI ve CES'in maddeleri CUCEI'yi geliştirmek için kullanılmıştır. Ayrıca, mevcut sınıf ortamı araçlarının maddeleri ve ölçekleri kullanılarak, Bu Sınıfta Neler Oluyor? (WIHIC) ölçeği geliştirilmiştir (Fraser, McRobbie ve Fisher, 1996).

Öğretmen adaylarının sınıf ortamı algılarını değerlendirmek için yeni bir ölçek geliştirmenin nedenlerinden biri yukarıda belirtilen envanter ve ölçeklerin (Kolej ve Üniversite Sınıf Ortamı Envanteri hariç) genellikle ilköğretim ve ortaöğretim öğrencilerinin sınıf ortamı algılarını ölçmesidir. Yükseköğretim kurumlarındaki öğrencilerin sınıf ortamı algılarını değerlendirmek için geliştirilen bazı araçların (ör., Fen Laboratuarı Ortamı Envanteri, SLEI) öğretmen adaylarının sınıf ortamı algılarını değerlendirmek için uygun olmadığı düşünülmektedir. Son olarak, Türkiye'de sınıf ortamlarını değerlendirmek için araçların geliştirilmesi ya da uyarlanması konusunda az sayıda çalışma yapılmıştır. Her ne kadar bazı araştırmacılar İngilizce yayınlanan ölçekleri uyarlayarak sınıf ortamı araştırmalarına katkıda bulunmuşlarsa da (Atbaş, 2004; Kesal, 2003; Küçüközer, Kırtak-Ad, Ayverdi ve Eğdir, 2012; Özkök, Yurdugül, ve Askar, 2011; Sagkal, Topçu Kabasakal ve Turnuklu, 2015) öğretmen adaylarının sınıf ortamı algılarını belirlemek için kullanılabilecek kapsamlı bir ölçeğe gereksinim duyulmaktadır. Alanyazında öğretmen adaylarının sınıf ortamı algılarını ölçen kapsamlı bir ölçeğe rastlanamaması nedeniyle yeni bir ölçek geliştirme kararı alınmıştır.

Yöntem

Bu çalışma, tarama araştırması tasarımına dayanmaktadır. Tarama araştırmaları önceden belirlenmiş bir örneklemin özelliklerini tek bir noktada rapor etmektedir (Fraenkel ve Wallen, 2009; Gall, Gall ve Borg, 2003). Bu şekilde, örneklemde yer

alan bireylerin tutumları, görüşleri, davranışları veya özellikleri açıklanmaktadır (Cohen, Manion ve Morrison, 2007; Creswell, 2012).

2016-2017 öğretim yılı bahar döneminde açımlayıcı faktör analizi (AFA) için 520 öğretmen adayı ve 2017-2018 eğitim-öğretim yılı güz döneminde doğrulayıcı faktör analizi (DFA) için 280 ikinci sınıf öğretmen adayı çalışmaya katılmıştır. 520 öğretmen adayının 314'ü (% 60.38) kadın, 206'sı (% 39.62) erkektir ve 251'i (% 48.27) Uşak Üniversitesinde; 239'u (% 45.96) Ege Üniversitesinde ve 30'u (% 5.77) Manisa Celal Bayar Üniversitesinde öğrenim görmektedir. 280 öğretmen adayının 201'i (% 71.79) kadın, 79'u (% 28.21) erkektir ve 77'si (% 27.50) Sınıf Öğretmenliği Bölümünde; 85'i (% 30.36) Türkçe Öğretmenliği Bölümünde; 69'u (% 24.64) Fen Bilgisi Öğretmenliği Bölümünde ve 49'u (% 17.50) İlköğretim Matematik Öğretmenliği Bölümü'nde öğrenim görmektedir.

Bu araştırmanın amacı, öğretmen adaylarının psikososyal öğrenme ortamına ilişkin algılarını değerlendirmek için bir sınıf ortamı ölçme aracı geliştirmektir. Bu çalışmada öncelikle psikososyal öğrenme ortamı ölçme araçları ile ilgili kapsamlı bir alanyazın taraması yapılmıştır. Ölçek, yapılandırmacılık, çevre-uyum teorisi ve aynı zamanda Fraser ve meslektaşlarının çalışmalarına uygun olarak geliştirilmiştir (Coll, Taylor ve Fisher, 2002; Fraser, 1980; Fraser, Anderson ve Walberg, 1982; Fraser, Giddings ve McRobbie, 1992; Fraser ve diğ., 1996; Fraser ve Treagust, 1986; Rentoul ve Fraser, 1980; Taylor, Fraser ve Fisher, 1997; Trickett ve Moos, 1973; Trinidad, Aldridge ve Fraser, 2005). Bu çalışmada, maddelerin açıklığı, okunabilirliği ile ilgili uzman görüşleri alınmıştır. Ayrıca, Türkçe Öğretmenliği Bölümünden bir araştırma görevlisi, ölçeği dilbilgisi ve cümlelerin anlaşılırlığı açısından incelemiştir. Ardından, geliştirilen ölçeğin pilot formu maddelerin ve yönergelerin açıklığı ve okunabilirliğini incelemek üzere yedi öğretmen adayına uygulanıp onların görüşleri alındıktan sonra ölçek son şeklini almıştır.

Öğretmen Adaylarının Sınıf Ortamı Algıları Ölçeğinin pilot formu, Moos'un (1974) ilişki, kişisel gelişim ile sistem bakım ve sistem değişimi boyutlarına uygun olarak 60 maddeyi içermiştir. Bu pilot form, mevcut araçlardan uyarlanan veya yeni oluşturulan olumlu ve olumsuz olarak yazılmış maddeleri içermektedir. Ölçeğin pilot formu öğretmen adaylarının sınıf ortamının psikososyal boyutları olan kişiselleştirme (personalization), katılım (involvement), öğrenci bağlılığı (student cohesiveness), memnuniyet (satisfaction), görev yönelimi (task orientation), yenilik (innovation), öğretmen desteği (teacher support), işbirliği (cooperation) ve bireyselleşme (individualization) alt-ölçeklerini içermektedir.

Ölçeğin faktör yapısını değerlendirmek için, açımlayıcı faktör analizi (AFA) ve daha sonra doğrulayıcı faktör analizi (DFA) uygulanmıştır. Son olarak, faktörlerin güvenirlik katsayıları hesaplanmıştır. AFA promax rotasyon tekniği kullanılarak gerçekleştirilmiştir. Ölçeğin faktör yapısı, güçlü standart hatalarla Maksimum Olabilirlik (MLR) metodu kullanılarak DFA ile doğrulanmıştır.

Bulgular

Çalışmada KMO değeri .92 olarak bulunmuştur ve Kaiser (1974) tarafından belirtilen ölçütlere göre .90'ın üzerindeki değerler mükemmeldir (akt., Field, 2009). Bu nedenle örneklem büyüklüğünün faktör analizi için yeterli olduğu söylenebilir. Ayrıca Bartlett testi sonuçları anlamlı bulunmuştur (χ^2_{741} = 7778.47, p < .000). Bu nedenle verilerin faktör analizi için uygun olduğu söylenebilir. PAF ve promax rotasyon tekniği kullanılarak AFA yapıldıktan sonra, özdeğerleri birden büyük olan faktörler göz önüne alınmıştır. Bunlara ek olarak, DFA aşağıdaki model uyum indekslerini önermiştir: χ^2_{648} = 1214.74, p <.000, RMSEA = .056, CFI = .97, NFI = .94, NNFI = .97, IFI = .97, RFI =. 94 ve GFI = .81. χ^2/df değerinin ikiden az olması (χ^2/df = 1.87, p < .000), ölçeğin iyi uyum istatistiklerine sahip olduğunu göstermektedir.

Ölçek, 38 maddeden oluşan 5'li likert tipinde (1-kesinlikle katılmıyorum, 5-tamamen katılıyorum) geçerli ve güvenilir altı alt-ölçekten oluşmaktadır: 1. Memnuniyet, 2. İşbirliği, 3. Katılım, 4. Öğrenci Bağlılığı, 5. Görev Yönlendirme ve 6. Zorluk. Memnuniyet alt-ölçeği 10 maddeden oluşmaktadır (Ör.: Öğrenciler derse gelmeyi dört gözle bekler.), İşbirliği alt-ölçeği yedi maddeden oluşmaktadır (Ör.: Her öğrenci bireysel veya grup çalışmalarında görevlerini tam olarak yerine getirmeye çalışır), Katılım alt-ölçeği yedi maddeden oluşmaktadır. (Ör.: Öğrenciler derste yapılan etkinlikleri tamamlamak için çabalar.), Görev Yönelimi alt-ölçeği beş maddeden oluşmaktadır (Ör.: Dersteki öğrenme görevleri açık ve dikkatli bir şekilde planlanmıştır.), Öğrenci Bağlılığı alt-ölçeği beş maddeden oluşmaktadır (Ör.: Bu derste öğrenciler birbirini iyi tanır.) ve Zorluk alt-ölçeği dört maddeden oluşmaktadır (Ör.: Öğrenciler sınıf içi grup çalışmalarını yaparken zorlanır.). Faktörlerin güvenirlik katsayısı .72 ve .85 arasında değişmektedir.

Tartışma, Sonuç ve Öneriler

Bu araştırmada öğretmen adaylarının psikososyal sınıf ortamına ilişkin algılarını değerlendirmek amacıyla sınıf ortamı algıları ölçeği geliştirilmiştir. Toplanan veriler SPSS 22 ve Lisrel 8.8 kullanılarak analiz edilmiştir. Ölçeğin yapı geçerliğini test etmek için AFA ve DFA uygulanmıştır. Yapılan analizler ölçeğin geçerli ve güvenilir yapıda olduğunu göstermektedir.

Ölçek geliştirilirken alanyazındaki mevcut ölçme araçları incelenmiştir. Alanyazındaki bazı ölçme araçlarının alt-ölçekleri, geliştirilen ölçeğe dahil edilmiş olsa da bu alt-ölçeklerin bazı maddeleri çıkarılmış, bazı maddeler eklenmiş, diğerleri ise yeniden yazılmıştır. Örneğin, alanyazında üniversite sınıflarının psikososyal özelliklerini değerlendirmek amacıyla sıklıkla kullanılan CUCEI'de yer alan kişiselleştirme alt-ölçeği geliştirilen ölçekte bulunmamaktadır çünkü Eğitim Fakültelerinde, öğrencilerin kişisel refahından daha çok öğrenciler arasındaki işbirliği ve bağlılığın vurgulanabileceği düşünülmüştür. Bunlara ek olarak, geliştirilen ölçekte yer alan zorluk alt-ölçeği CUCEI'de yer almamaktadır. Ölçek geliştirilirken öğrencilerin sınıf ortamı algılarının bağlamdan etkilenebileceği, yapılandırmacı, ters-

yüz öğrenme, uzaktan eğitim ve geleneksel sınıflar gibi farklı sınıf ortamlarında, öğrencilerin sınıf ortamlarını farklı zorluk düzeylerinde algılayabilecekleri ve bunun da başarılarını etkileyebileceği düşünülmüştür. Bunlara ek olarak, alanyazında yer alan ve pek çok araştırmada kullanılan sınıf ortamı ölçme araçlarından WIHIC, ölçeğe dahil edilmeyen araştırma, eşitlik alt-ölçeklerini içermektedir. Örneğin, Charalampous ve Kokkinos (2017) tarafından da belirtildiği gibi araştırma alt-ölçeğinin, beceri, sorgulama ve problem çözme gibi bilimsel süreçleri gerektirmesi nedeniyle öğretmen eğitimi gibi sosyal becerilerin yoğunlukla kullanıldığı sınıflarından çok fen bilimleri alanında öğretim yapılan sınıflar için daha uygun olduğu düşünülmüştür.

Ayrıca, geliştirilen ölçeğin pilot formu, katılım, yenilik, öğrenci bağlılığı, işbirliği, bireyselleştirme, memnuniyet, görev yönelimi, demokrasi ve zorluk olmak üzere dokuz alt-ölçekten oluşmuştur. Bu pilot form, sınıf ortamını kapsamlı olarak betimlemek amacıyla Moos (1974) tarafından belirtilen üç genel kategoriyi içermiştir. Ancak açımlayıcı faktör analizden sonra, bazı maddelerdeki faktör yüklerinin düşük olması veya aynı maddenin farklı faktörlerde de yüklemesi nedeniyle geliştirilen ölçeğin bireyselleşme, demokrasi ve yenilik alt-ölçekleri yok olmuştur. Örneğin, yenilik ölçeğindeki bir madde *Öğretim elemanı, öğrencilere alışkın olduklarından farklı etkinlikler düzenlemektedir* biçimindedir. Bu maddenin hem yenilik hem de katılım alt-ölçeklerinde 0.30'un üzerinde yüklendiği görülmüştür. Bu nedenle ölçekten çıkarılmıştır. Benzer şekilde Chapman (2012) tarafından yapılan çalışmada WIHIC, Gürcistan'da 5-8. sınıflarda öğrenim gören 512 öğrenciye, öğrenci bağlılığı ve işbirliği alt-ölçeklerinin birleştirilmesinin yanı sıra araştırma ve katılım alt-ölçekleri de birleştirilerek ve birçok madde yeniden yazılarak uygulanmıştır. Faktör analizinin sonuçları, bazı maddelerin çıkarılmasının yanında öğrenci bağlılığı-işbirliği alt ölçeğinin de çıkarılmasına yol açmıştır. Ayrıca, Coll ve diğ. (2002) tarafından yapılan çalışmada, CUCEI'nin güvenirliği sadece iki alt-ölçek için (memnuniyet ve bağlılık) sağlanmıştır. Çünkü ölçek Pasifik Adaları'ndaki bölgesel bir üniversitede kültürel olarak çeşitli üniversite öğrencilerine uygulanmıştır ki bu öğrencilerin büyük bir çoğunluğu için İngilizce ikinci veya üçüncü dildir. Bu sonuçlara dayanarak öğrencilerin sınıf ortamı algılarının sınıf düzeyine, öğretmen ve öğrencilerin tutumuna ve farklı kültürlere göre farklılık gösterebileceği söylenebilir. Ayrıca belirli bir sınıf ortamı için geliştirilmiş bir ölçeğin ve alt boyutlarının diğer bir sınıf ortamı için uygun olmayabileceği araştırmacılar tarafından dikkate alınmalıdır.

Katılımcıların Ege Bölgesi'ndeki üç üniversiteden seçilmiş olması, bu çalışmanın sınırlılıklarından biri olarak belirtilebilir. Bu ölçeğin faktör yapısının Türkiye'deki farklı bölgelerden gelen öğretmen adaylarını dahil ederek daha büyük örneklemle kontrol edilmesi önerilmektedir.

Son olarak, ölçeğin yapı geçerliği ve iç tutarlığı belirlenmiştir ve öğretmen adaylarının sınıf ortamı algıları ile farklı bilişsel ve duyuşsal değişkenler arasındaki ilişkilerin araştırılmasında kullanılabilir. Bu şekilde, öğretmen adaylarının öğrenimi, onlara daha uygun bir sınıf ortamı sağlayarak geliştirilebilir.

Appendix A

The Classroom Environment Instruments (LEI, CES, ICEQ, MCI, CUCEI, QTI, CLES and WIHIC) and the Sub-scales

Instrument	Level	Items per sub-scale	Sub-scales classified according to Moos' Scheme		
			Relationship Dimensions	Personal Development Dimensions	System Maintenance and Change Dimensions
Classroom Environment Scale (CES)	Secondary	10	Involvement Affiliation Teacher support	Task orientation Competition	Order and organization Rule clarity Teacher control Innovation
The Individualized Classroom Environment Questionnaire (ICEQ)	Secondary	10	Personalization Participation	Independence Investigation	Differentiation
Learning Environment Inventory (LEI)	Secondary	7	Cohesiveness Friction Favoritism Cliqueness Satisfaction Apathy	Speed Difficulty Competitiveness	Diversity Formality Material Env. Goal direction Disorganization Democracy
The My Class Inventory (MCI)	Elementary	6-9	Cohesiveness Friction Satisfaction	Difficulty Competitiveness	
What is Happening in This Classroom (WIHIC)	Secondary	8	Student cohesiveness Teacher Support Involvement	Investigation Task orientation Cooperation	Equity
Constructivist Learning Environment Survey (CLES)	Secondary	7	Personal relevancy Uncertainty	Critical voice Shared control	Student negotiation
College and University Classroom Environment Inventory (CUCEI)	Higher Education	7	Personalization Involvement Student Cohesiveness Satisfaction	Task orientation	Innovation Individual-ization
Questionnaire on Teacher Interaction (QTI)	Secondary/ Primary	8-10	Helpful/ friendly Understanding Dissatisfied Admonishing		Leadership Student responsibility and freedom Uncertain strict

Appendix B

EĞİTİM FAKÜLTESİ ÖĞRENCİLERİNİN SINIF ORTAMI ALGILARI ÖLÇEĞİ

Ölçekte yer alan her bir maddeye ilişkin görüşlerinize uyan "Kesinlikle Katılmıyorum, Katılmıyorum, Kısmen Katılıyorum, Katılıyorum, Tamamen Katılıyorum" seçeneklerinin altında bulunan boşluğa (X) işareti koymanız beklenmektedir.

	Kesinlikle Katılmıyorum	Katılmıyorum	Kısmen Katılıyorum	Katılıyorum	Tamamen Katılıyorum
1. MEMNUNİYET (SATISFACTION)					
8. Öğrenciler derse istekli olarak katılır.					
12. Derse sadece birkaç öğrenci katılır.					
13. Öğrencilerin çoğu uyuklar.					
16. Dersteki etkinlikler öğrencilerin ilgisini çekmez.					
17. Derste öğrenciler çok sıkılır.					
38. Öğrenciler derse gelmeyi dört gözle bekler.					
39. Öğrenciler dersteki etkinliklerden memnun olur.					
40. Öğretim İlke ve Yöntemleri dersi kapsamındaki her bir ders sıkıcıdır.					
41. Öğretim İlke ve Yöntemleri dersi ilginçtir.					
44. Derste öğrenciler konuya odaklanmak yerine başka konularda konuşur.					
2. İŞBİRLİĞİ (COOPERATION)					
24. Öğrenciler birbirleri ile yarışmak yerine işbirliği yaparlar.					
27. Farklı gruplardaki öğrenciler arasında iyi arkadaşlıklar kurulur.					
28. Öğrenciler eşli ve grup çalışmalarında birlikte çalışmaktan hoşlanırlar.					
29. Öğrenciler birbirleriyle yardımlaşırlar.					
30. Öğrenciler bireysel ya da grup çalışmalarında birbirlerine saygı duyarlar.					
31. Derste öğrenciler başarılı olabilecekleri konusunda birbirlerini cesaretlendirir.					
32. Bireysel veya grup çalışmalarında her öğrenci üzerine düşen görevi tam olarak yerine getirmeye çalışır.					

(devam ediyor)

Eğitim Fakültesi Öğrencilerinin Sınıf Ortamı Algıları Ölçeği (devam)

	Kesinlikle Katılmıyorum	Katılmıyorum	Kısmen Katılıyorum	Katılıyorum	Kesinlikle Katılıyorum
3. KATILIM (INVOLVEMENT)					
2. Öğrenciler derste yapılan etkinlikleri tamamlamak için çabalar.					
4. Öğrenciler arkadaşlarının söylediklerini dikkatle dinler.					
5. Öğrenciler yaptıkları çalışmaları sınıfta sunarlar.					
6. Derste öğrencilere fikirlerini açıklama fırsatı verilir.					
10. Öğrenciler öğretim elemanı konuşurken notlar alır.					
11. Öğretim elemanı dersle ilgili açıklamalar yaparken öğrenciler dikkatlice dinler.					
15. Derste öğrenciler etkinlikleri bireysel ya da grup olarak yerine getirmeye çalışır.					
4. GÖREV YÖNLENDİRME (TASK ORIENTATION)					
45. Derste yapılacak görevler oldukça net bir şekilde belirtildiği için herkes ne yapması gerektiğini bilir.					
46. Ders zamanında başlar.					
47. Dersteki öğrenme görevleri açık ve dikkatli bir şekilde planlanmıştır.					
49. Derste zaman verimli bir şekilde kullanılır.					
51. Sınıfı etkileyen kararlar demokratik olarak sonuçlandırılır.					
5. ÖĞRENCİ BAĞLILIĞI (STUDENT COHESIVENESS)					
21. Bu derste öğrenciler birbirini iyi tanır.					
22. Derste her öğrenci sınıftaki diğer kişilerin adlarını bilir.					
23. Derste öğrenciler arasında arkadaşlık ilişkileri vardır.					
25. Derste öğrencilerin birbirini tanıma olanağı pek yoktur.					
26. Derste öğrenciler birbirlerini tanıma konusunda isteksizdir.					
6. ZORLUK (DIFFICULTY)					
55. Öğrenciler dersten önce yapılacak çalışmaları zor bulur.					
56. Öğrenciler sürekli olarak daha fazlası için zorlanır.					
58. Sınıf içinde verilen görevler zordur.					
60. Öğrenciler sınıf içi grup çalışmalarını yaparken zorlanır.					