

Assessing the Psychosocial Classroom Environment of Teacher Training Classrooms*

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Abstract. This study aimed to investigate the classroom environment perceptions of pre-service teachers enrolled in different departments of a Faculty of Education and to investigate the relations among classroom environment perceptions of pre-service teachers and their course achievement. It was conducted in an education course in the fall semester of the academic year 2017-2018 at a state university. The study was designed according to survey research design and 277 pre-service teachers were chosen according to the convenience sampling method. The data were collected through the "Classroom Environment Perceptions Scale of Pre-Service Teachers (CEPSPT)" analyzed by using descriptive and inferential analysis techniques. The results of the study showed that the departments of pre-service teachers had a significant effect on the perceptions of the classroom environment. Pre-service teachers who enrolled in Classroom Teaching Department perceived classroom environment favorable than those who enrolled in other departments. Moreover, pre-service teachers who enrolled in Elementary School Mathematics Teaching Department perceived the difficulty property of the classroom environment at highest. Finally, several correlations were obtained among the dimensions of the classroom environment and also between the achievement scores of pre-service teachers and their classroom environment perceptions. The findings were discussed in detail concerning classroom environment literature.

Keywords: Classroom environment dimensions, pre-service teachers, course achievement.

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1. INTRODUCTION

Fraser (1986, p. 1) defined the classroom environment as the “shared perceptions of students and teachers in that environment”. Reid and Radhakrishnan (2003) stated that the classroom environment is related to the perceptions of students about their academic experience. These perceptions may imply difficulty aspects of the class, student-student interactions, student-teacher interactions, and their involvement in in-class activities. Similarly, Ramsden (1979) explained the classroom environment as the course organization, subject areas, teaching, and assessment methods implemented in different departments without including the properties of physical environment like lighting, materials, physical space, seating arrangements, and temperature. Reid and Radhakrishnan (2003) stated that even though each student develops his or her sense of the classroom environment, there is also a collective sense among students and instructors, so the perception of the classroom environment is a general feeling shared by all present in the class. According to researchers, without a comprehensive consideration of classroom environments, educational productivity cannot be provided (Fraser, 1986; Dorman, Aldridge & Fraser, 2006).

The psychosocial aspect of the classroom environment such as satisfaction, cooperation, student involvement, task orientation, student cohesiveness, and the difficulty has increased its importance considerably thanks to the effect of positive classroom environment on cognitive and affective development of students (Afari, Aldridge, Fraser, & Khine, 2013; Baek & Choi, 2002; Fraser, 1986; LaRocque, 2008). Different psychosocial properties of classroom environment were defined by Fraser and his colleagues (Fraser, 1980; Fraser, Anderson & Walberg, 1982; Fraser, McRobbie & Fisher 1996; Rentoul & Fraser, 1980; Taylor, Fraser & Fisher, 1997; Fraser & Treagust, 1986; Trickett & Moos, 1973). The ‘satisfaction’ property of the classroom environment is about whether students enjoy class tasks or not. ‘Cooperation’ property of the classroom environment is about the cooperation of students rather than being in a race with each other while conducting in-class tasks. The ‘involvement’ property of the classroom environment is about students’ participation in different activities like class discussions, their interest in the course, conducting research willingly, doing additional studies. Besides, when the ‘task orientation’ property of the classroom environment is taken into consideration, it is important to complete arranged activities and continue working on the tasks related to the course. The ‘student cohesiveness’ property of the classroom environment is about the intimacy of relationships and related to how well students know each other, how much they help when anyone needs, and how much they support each other while conducting class tasks. The ‘difficulty’ property of the classroom environment is stated as to whether students find the work hard or not.

The relationships among different cognitive and affective student outcomes like the achievement (Baek & Choi, 2002; Chionh & Fraser, 2009; Goh & Fraser, 1995; Roth 1998), attitude (Chien, 2007; Goh & Fraser, 2000), autonomy and student-centeredness (Roth 1998), engagement (Dotterer & Lowe, 2011), motivation (Arisoy, 2007), satisfaction (Fraser & Treagust, 1986; Zandvliet, 1999), self-esteem (Chionh & Fraser,

2009), academic self-efficacy (Afari et al., 2013; Dorman, Adams & Ferguson, 2003), self-regulation (Velayutham & Aldridge, 2013) have been found by implementing different classroom environment instruments in different grade levels (Fraser, 1998).

The results of many studies demonstrated that students learn better when they perceive their classroom environment favorable (Baek & Choi, 2002; Chionh & Fraser, 2009; Dorman et al., 2006). Classrooms that are perceived as supportive and non-threatening in terms of teacher-student interaction increase the level of satisfaction and achievement of students (Atbas, 2004; Kingir, Tas, Gok, & Sungur-Vural, 2013; LaRocque, 2008; Roth, 1998). Moreover, Yan and Kember (2003) found that students' perception of the classroom environment has a profound effect on the group learning approaches adopted by them. On the other hand, many classrooms are characterized by their less favorable interpersonal relationships among peers and teachers and have decreased students' involvement, and achievement scores due to the absence of opportunities for student self-management, choice, collaboration, cooperation. (Wang, 2012).

Researchers investigated the qualities of the classroom environment according to different grade levels (Lee, Lee & Wong, 2003), subjects (Afari et al., 2013; Chionh & Fraser, 2009; O'Reilly, 1975; Peters, 2013), classroom contexts, type of school (Kim, Fisher & Fraser, 1999; Goh & Fraser, 1995; Wahyudi & Treagust, 2004), teacher qualifications (Fraser, 1987; Nix, Fraser & Ledbetter, 2005) and class size (Baek & Choi, 2002; Fraser, 1980; Fraser & Fisher, 1983; Fraser, 1987; Fraser & Treagust, 1986; Goh & Fraser, 1995; Kim, Fisher, & Fraser, 2000; Reid & Radhakrishnan, 2003).

Lee et al. (2003) found that primary school students tended to have significantly higher levels of collaboration, teacher support, and involvement in the actual classroom environment than those of the secondary schools. The study conducted by Fresko, Carmeli and Ben-Chaim (1989) showed that students perceived the classes as more diverse when they were taught by teachers who had received pedagogical training compared to those who have not received any training. With respect to experience, students perceived the classes as the least satisfying and fast-paced, but as the most diverse one when they were taught by teachers with more than 15 years of teaching experience. Students' grade level was also related to their perception of the classroom environment. While students in the seventh grade perceived the classroom environment as more satisfying, ninth-grade students perceived the classroom environment as more difficult than seventh and eighth-grade students, and diversity has decreased as the grade level has risen. Concerning the school size, students perceived the classroom environment of large schools as more difficult, more inquiry-oriented, and less diverse (Fresko et al., 1989). Similarly, LaRocque (2008) investigated the classroom environment perceptions of elementary school students in their mathematics class and their reading achievement in a large urban school district. The researcher found that students with lower grades perceived their classroom as more competitive and less cohesive than the students with higher grades. Also, it was determined that as students' grade levels increased, they became less satisfied with their classroom environment.

In addition to these, the classroom environment perceptions of students change according to courses taught in different departments. Yan and Kember (2003) stated that the departments which students enrolled in have a great deal of influence on these students about whether they would be involved in courses or abstained from learning. According to them, teachers had shaped the classroom environments intentionally or unintentionally regarding the courses taught in different departments through their instructional approaches, styles, curriculum, types of assessment procedures, and the nature of relationships among students and teachers. These factors form the classroom environment by affecting the learning behavior of students. Ramsden (1979) stated that “students learn the requirements of social situations and what makes for success in them so that they can turn themselves into the kind of persons that the academic context demands.”

Similarly, Biggs (1970) expressed that the requirements of departments are characteristically different and for this reason, different methods of learning such as discussions, PowerPoint presentations, cooperative learning, individual study, etc. were implemented according to the requirements of departments. It was explained that achievement in Science classes mostly related to the attainment of prior knowledge about the subject, but in the faculties of Art classes, it is less related to prior knowledge but mostly related to the students’ level of interest in tasks.

As supported by the statements mentioned above, Ramsden (1979) found that undergraduate students in six different departments at a British University possessed distinctive classroom environments in which different learning approaches were employed. The undergraduate students in the natural sciences and applied sciences departments perceived education in a very formal way and the lectures were more important than individual study as a means of learning. However, undergraduate students in the social science departments informed that even though most of the time is spent in class, learning is achieved by individual study. Also, they stated that the learning environment was informal and cooperative. In addition, undergraduate students in the natural, social, and applied sciences departments have experienced close and cooperative relationships among their peers about their work. Moreover, undergraduate students in the applied sciences department stated that the goals and standards were set clearly and they knew where they were headed to. Hence, they perceived the task orientation property of the classroom environment positively. Different from the applied sciences departments, undergraduate students in the natural sciences department were not provided with clear guidelines in terms of assessment standards. On the other hand, undergraduate students in the applied science department perceived their course liabilities much more than the students in any of the other departments. Thus, undergraduate students in the applied science department perceived the difficulty property of the classroom environment as higher.

As can be seen, there are hardly any recent studies to investigate the classroom environment perceptions of students enrolled in different departments. It was observed that there is a gap in the literature in terms of investigating the psychosocial properties

of teacher training classroom environments perceived by pre-service teachers who are studying in different departments and these properties relation with their course achievement.

Aim of the Study and Research Question

This study aimed to investigate whether the classroom environment perceptions of pre-service teachers change for different departments of a state university. Also, this study aimed to investigate the relations among classroom environment perceptions of pre-service teachers and their course achievement. Based on the purpose of the study, the following research questions were proposed:

1. What is the effect of the department on pre-service teachers' perceptions of the classroom environment?
2. What are the relations among the classroom environment perceptions of pre-service teachers and their course achievement?

2. METHOD

This study was based on a survey research design. In this type of research, quantitative data collection procedures are employed where researchers implement scales or questionnaires to a large sample to describe the attitudes, opinions, behaviors, or characteristics of the population (Creswell, 2012). In survey design, researchers collect data at just one point in time from a sample pulled from a pre-determined population (Fraenkel & Wallen, 2009).

Participants

Data were collected from 277 pre-service teachers. In this study, the convenience sampling method was used (Fraenkel & Wallen, 2009). Hence, participants were chosen from those to whom researchers have easy access or those who are available and accessible at the time (Cohen et al., 2007). Moreover, Gall, Gall, & Borg (2003) stated that researchers select a sample that suits the purposes of the study. Among the 277 pre-service teachers, 77 (27.8%) of them from Classroom Teaching Department; 85 (30.7%) of them from Turkish Language Teaching Department; 66 (23.8%) of them from Science Teaching Department and 49 (17.7%) of them from Elementary School Mathematics Teaching Department.

Data Collection Instrument

In this study, data were collected through the Classroom Environment Perceptions Scale of Pre-Service Teachers (CEPSPT). It was developed by Ozudogru & Aksu (2019) and included 38 Likert-type items related to pre-service teachers' perceptions of the classroom environment. The sample items across the factors of the CEPSPT and the reliability of each factor were shown in Table 1. The reliability of the whole scale was examined by Cronbach's Alpha coefficients of internal consistency and was calculated as 0.91.

Table 1.

Sample Items across the Factors of the CEPST and the Reliability of each Factor

Factors	Number of Items	Sample Items	Reliability Coefficients
1. Satisfaction	10	Students look forward to coming to this course.	.85
2. Cooperation	7	Each student tries to fulfill his/her duties fully individually or in the group works.	.84
3. Involvement	7	Students strive to complete the activities that are being conducted in class.	.77
5. Task Orientation	5	Students know each other well.	.83
4. Student Cohesiveness	5	The learning tasks are planned clearly and carefully.	.77
6. Difficulty	4	Students are challenged in group work conducted in class.	.72

Data Collection Procedures

The current study was conducted at the end of the fall semester of the academic year 2017-2018 at a state university located in the Aegean Region. The scale was administered to a total of 277 pre-service teachers at the beginning of January to obtain insights about the classroom environment perceptions of pre-service teachers in the Principles and Methods of Instruction course. The students were provided with information about the aims of the study and how to fill in the scale. Also, pre-service teachers were informed about confidentiality and requested to be sincere while answering the items. It took approximately 15 minutes to complete the scale.

Data Analysis

In order to examine the effect of the different departments on pre-service teachers' classroom environment perceptions, MANOVA was conducted because there were six dependent variables (Tabachnick & Fidell, 2007). For MANOVA analyses, SPSS 22 software was used. Before conducting MANOVA, the assumptions of univariate, multivariate normality, homogeneity of variance, homogeneity of covariance, and outliers were checked in order to explore the appropriateness of the data for MANOVA (Field, 2009; Tabachnick & Fidell, 2007). In this study, Mardia's test results indicated a

significant pattern ($p < .05$). That means the multivariate normality assumption is violated for MANOVA (Tabachnick & Fidell, 2007). According to Tabachnick and Fidell (2007), a sample size that includes about 20 observations in the smallest cell ensures robustness for multivariate normality. Alpha level was determined as .05 for analysis.

Moreover, the homogeneity of variance assumption was checked with Levene's test to determine whether the variances in different groups were equal (Field, 2009). According to the results of Levene's test, the homogeneity of variance assumption was not violated for the dependent variables which are Involvement, $F(3, 273) = 1.83, p > .05$; Student Cohesiveness $F(3, 273) = .10, p > .05$; Difficulty, $F(3, 273) = .35, p > .05$. However, the homogeneity of variance assumption for Satisfaction $F(3, 273) = 3.45, p < .05$; Cooperation, $F(3, 273) = 2.74, p < .05$; Task Orientation $F(3, 273) = 2.69, p < .05$ was violated. Hence, the alpha level for satisfaction, cooperation, and student cohesiveness was determined as .04 as stated by Field (2009) to keep Type I error control very rigid.

Furthermore, the homogeneity of covariance assumption was checked with Box's M test (Field, 2009). The result of Box's M test should be non-significant if the matrices are the same (Tabachnick & Fidell, 2007). In this study, Box's $M = 111.26, F(63, 128969.68) = 1.69, p < .05$. Hence, the homogeneity of covariance assumption was violated. For this reason, Pillai's Trace values were reported in order to check the significance of the MANOVA model.

In addition, Pearson correlation coefficients were computed in order to investigate if there are statistically significant correlations among achievement scores of pre-service teachers and their perceptions about different classroom environment dimensions.

3. FINDINGS

In this part of the study, firstly, results about the effect of the department on pre-service teachers' classroom environment perceptions were presented, then, the results concerning the correlations among achievement scores of pre-service teachers and their perceptions about different dimensions of classroom environment were revealed in line with the research questions.

The Results about the Effect of Department on Pre-Service Teachers' Perceptions of Classroom Environment

In order to investigate the perceptions of pre-service teachers related to classroom environment who enrolled in an education course from different departments, MANOVA was conducted. Before interpreting the results of MANOVA, descriptive statistics were shown in Table 2.

According to descriptive statistics shown in Table 2, pre-service teachers who enrolled in Classroom Teaching Department perceived the satisfaction ($M = 40.79, SD = 4.57$), cooperation ($M = 29.01, SD = 3.54$), involvement ($M = 29.55, SD = 3.09$), student cohesiveness ($M = 20.64, SD = 3.03$) and task orientation, ($M = 21.97, SD = 2.45$) properties

of classroom environment higher than pre-service teachers who enrolled in other departments. On the other hand, pre-service teachers who enrolled in Classroom Teaching Department perceived the difficulty ($M=9.19$, $SD=2.93$) property of the classroom environment lower than pre-service teachers who enrolled in other departments. Moreover, pre-service teachers who enrolled in Elementary School Mathematics Teaching Department perceived the difficulty property of the classroom environment at highest ($M=11.57$, $SD=3.23$) among the pre-service teachers who enrolled in other departments.

Table 2.

Mean Scores and Standard Deviations for the Scales of CEPSPT

Department	Satisfaction		Cooperation		Involvement		Student Cohesiveness		Task Orientation		Difficulty	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Classroom Teaching Department	40.79	4.57	29.01	3.54	29.55	3.09	20.64	3.03	21.97	2.45	9.19	2.93
Turkish Teaching Department	37.53	6.60	27.26	4.52	27.74	3.73	19.36	3.39	19.71	3.27	10.05	3.17
Science Teaching Department	34.50	5.21	25.20	5.04	26.18	4.31	17.02	3.37	17.85	3.41	10.47	2.76
Mathematics Teaching Department	33.51	5.50	26.06	4.75	25.94	4.03	17.65	3.57	17.47	3.74	11.57	3.23

After conducting MANOVA analyses, it was found that the independent variable, the department, had a significant effect on dependent variables $F(18, 810) = 5.54, p < .05$. After checking the significance of the MANOVA model, univariate analyses were also interpreted in Table 3. Before checking ANOVA results, Bonferroni correction was conducted by dividing alpha value to the number of dependent variables ($.05/6 = .008$). According to the results shown in Table 3, department of pre-service teachers had a significant effect on all dependent variables which are Satisfaction $F(3, 273) = 23.01, p < .00$; Cooperation, $F(3, 273) = 9.69, p < .00$; Involvement, $F(3, 273) = 13.17, p < .00$; Task Orientation, $F(3, 273) = 28.07, p < .00$; Student Cohesiveness $F(3, 273) = 16.95, p < .00$ and Difficulty, $F(3, 273) = 6.45, p < .00$.

Table 3

Multivariate and Univariate Analyses of Variance for the Perceptions of Classroom Environment according to Departments of Pre-Service Teachers

Variable	MANOVA* F (18,810)	ANOVA** F (3,273)					
		Satisfaction	Cooperation	Involvement	Task Orientation	Student Cohesiveness	Difficulty
Department	5.54	23.01	9.69	13.17	28.07	16.95	6.45

* $p < .05$. ** $p < .008$

In addition to the descriptive results shown in Table 2, the univariate results also showed that pre-service teachers who enrolled in the Turkish Language Teaching Department differed significantly from the Science Teaching and the Elementary School Mathematics Teaching Departments according to some dimensions of the classroom environment. In other words, pre-service teachers who enrolled in the Turkish Language Teaching Department perceived the satisfaction, cooperation, task orientation, student cohesiveness properties of the classroom environment significantly higher than those who enrolled in the Science Teaching and the Elementary School Mathematics Teaching Departments. Finally, pre-service teachers who enrolled in the Science Teaching Department did not differ significantly than the pre-service teachers who enrolled in the Elementary School Mathematics Teaching Department according to all dimensions of the classroom environment.

The Results concerning the Correlations among Achievement Scores of Pre-Service Teachers and their Perceptions about different dimensions of Classroom Environment

In order to investigate whether or not there were statistically significant correlations among the perceptions of pre-service teachers about different dimensions of the classroom environment and their course achievement, Pearson correlation coefficients were calculated. Before interpreting the correlations among different dimensions of the classroom environment, descriptive statistics for the course achievement scores of pre-service teachers were shown in Table 4.

Tablo 4.

Mean Scores and Standard Deviations for the Course Achievement Scores

<i>Departments</i>	<i>Course Achievement Scores</i>	
	<i>M</i>	<i>SD</i>
Classroom Teaching Department	79.28	7.90
Turkish Teaching Department	81.54	6.67
Science Teaching Department	75.62	8.55
Mathematics Teaching Department	82.63	7.90

According to descriptive statistics shown in Table 4, pre-service teachers who enrolled in Elementary School Mathematics Teaching Department have received the highest mean scores ($M=82.63$, $SD=7.90$) than pre-service teachers who enrolled in other departments. On the other hand, pre-service teachers who enrolled in the Science Teaching Department have received the lowest mean scores ($M=75.62$, $SD=8.55$) than pre-service teachers who enrolled in other departments.

Having presented the descriptive statistics, Pearson correlation coefficients were computed for each department separately. It was found that several dimensions of the classroom environment significantly correlated among themselves positively ranging from small to moderate correlations (Cohen, 1988). While satisfaction, cooperation, involvement, task orientation, and student cohesiveness, revealed positive correlations among themselves, significant negative correlations were observed among difficulty and most of the other classroom environment variables. The correlations for the Classroom Teaching Department were shown in Table 5.

Table 5.

Correlation Matrix for the Elementary Education Classroom Teaching Department

Satisfaction (1)	Cooperation (2)	Involvement (3)	Task Orientation (4)	Student Cohesiveness (5)	Difficulty (6)	Course Grades (7)
1	1.00					
2	.43**	1.00				
3	.56**	.58**	1.00			
4	.54**	.38**	.67**	1.00		
5	.48**	.40**	.48**	.49**	1.00	
6	-.44**	-.16	-.25*	-.27*	-.27*	1.00
7	.03	.14	.06	.06	.15	.00

** $p < .001$, * $p < .05$

According to Table 5, the highest correlation ($r = .67$) was between task orientation and involvement dimensions of the classroom environment. It can be said that the more pre-service teachers perceive that instructors have pre-arranged activities for class and they should complete the planned tasks related to the course, the more they become willing to participate in different activities such as class discussions, conducting extra research, and doing additional studies. On the other hand, the lowest significant correlation ($r = -.25$) observed was between the involvement and difficulty dimensions of the classroom environment. It can be said that if pre-service teachers perceive the tasks as difficult, they will be less willing to participate in different activities such as participating in class discussions, conducting extra research, and doing additional studies. In the Elementary Classroom Teaching Department, classroom environment perceptions of pre-service teachers did not significantly correlate with the achievement scores of pre-service teachers. The correlations for the Turkish Language Teaching Department were shown in Table 6.

Table 6.

Correlation Matrix for the Turkish Language Teaching Department

Satisfaction (1)	Cooperation (2)	Involvement (3)	Task Orientation (4)	Student Cohesiveness (5)	Difficulty (6)	Course Grades (7)
1	1.00					
2	.39**	1.00				

3	.52**	.56**	1.00			
4	.50**	.42**	.72**	1.00		
5	.51**	.56**	.62**	.49**	1.00	
6	-.45**	-.34**	-.39*	-.29*	-.53**	1.00
7	.05	.22*	.06	.04	.32**	-.11 1.00

**p<.001, *p<.05

As presented in Table 6, similar to the Elementary Classroom Teaching Department, the highest correlation ($r = .72$) was between task orientation and involvement dimensions of the classroom environment. Also, cooperation and student cohesiveness dimensions of the classroom environment showed significant positive correlations with the course achievement in the Turkish Language Teaching Department. It can be said that the more pre-service teachers perceive the cooperation ($r = .22$) and students cohesiveness ($r = .32$) properties of the classroom environment to a higher degree, the more they receive higher course grades or vice versa. In other words, if the pre-service teachers have intimate relationships, help each other, and cooperate rather than compete while conducting tasks, they will receive higher grades. The correlations for the Science Teaching Department were shown in Table 7.

Table 7.

Correlation Matrix for the Science Teaching Department

Satisfaction (1)	Cooperation (2)	Involvement (3)	Task Orientation (4)	Student Cohesiveness (5)	Difficulty (6)	Course Grades (7)
1	1.00					
2	.50**	1.00				
3	.59**	.68**	1.00			
4	.47**	.32**	.74**	1.00		
5	.22	.33**	.43**	.32**	1.00	
6	-.24	-.25*	-.32**	-.26*	-.25*	1.00
7	.20	.06	.16	.11	.21	.07 1.00

**p<.001, *p<.05

As presented in Table 7, similar to the Elementary Classroom Teaching and Turkish Language Departments, the highest significant correlation ($r = .74$) was between task orientation and involvement dimensions of the classroom environment. On the other

hand, the lowest significant correlation was between the cooperation ($r = -.25$) and difficulty and also student cohesiveness ($r = -.25$) and difficulty dimensions of the classroom environment. In the Science Teaching Department, classroom environment perceptions of pre-service teachers did not significantly correlate with the achievement of pre-service teachers. The correlations regarding the Mathematics Teaching Department were shown in Table 8.

Table 8.

Correlation Matrix for the Elementary Mathematics Teaching Department

<i>Satisfaction (1)</i>	<i>Cooperation (2)</i>	<i>Involvement (3)</i>	<i>Task Orientation (4)</i>	<i>Student Cohesiveness (5)</i>	<i>Difficulty (6)</i>	<i>Course Grades (7)</i>
1	1.00					
2	.60**	1.00				
3	.67**	.79**	1.00			
4	.68**	.60**	.59**	1.00		
5	.77**	.62**	.63**	.61**	1.00	
6	-.43**	-.32*	-.33*	-.57**	-.48**	1.00
7	.74**	.78**	.70**	.63**	.72**	-.36*

** $p < .001$, * $p < .05$

As presented in Table 8, the highest correlation ($r = .79$) was between cooperation and involvement dimensions of the classroom environment. It can be said that as pre-service teachers cooperated, they became more involved in course activities or vice versa. On the other hand, the lowest significant correlation was between the cooperation ($r = -.32$) and difficulty dimensions of the classroom environment. It can be said that as pre-service teachers cooperate more, the perceived difficulty of class tasks decreases, and vice versa. In the Elementary Mathematics Teaching Department, different from the other departments, the achievement of pre-service teachers significantly correlated with all classroom environment dimensions. In other words, it can be said that if pre-service teachers obtain higher grades in the course, their perceptions of the classroom environment will also become more favorable.

4. RESULTS, DISCUSSIONS, AND SUGGESTIONS

In this part, findings of the study were discussed in detail and some recommendations were proposed for practice and future research.

Discussion about the Effect of Department on Pre-Service Teachers' Perceptions of Classroom Environment

In the current study, the classroom environment perceptions of pre-service teachers who enrolled in different departments of a state university were investigated. After the implementation of CEPSPT, the effects of the department on pre-service teachers' perceptions of satisfaction, cooperation, involvement, task orientation, student cohesiveness, and difficulty properties of the classroom environment were examined. The results of the MANOVA analysis showed that pre-service teachers from different departments perceived each classroom environment differently.

One of the reasons for this result might be related to the differences in courses taught in each department. The instructors mostly accept a solemn stance and involve traditional teaching methods in Mathematics Teaching and Science Teaching Departments, so there are less personal relationships between instructors and students as also stated by Ramsden (1979). In other words, the boundaries of courses like Calculus, Algebra, Physics, and Chemistry taught in the Mathematics Teaching and Science Teaching Departments are set clearly to a great extent and the information is systematically transmitted from instructors to pre-service teachers. Peters (2013) revealed that teacher-centered classroom environment was not a significant predictor of algebra achievement. In these departments, knowledge is transmitted from instructor to learners. Moreover, similar to the findings of the current study, LaRocque (2008) revealed that elementary school students perceived the classroom environment in mathematics as relatively more difficult and tended to have lower math achievement which showed the relationship between the difficulty dimension of the classroom environment and achievement in mathematics. Although the scale was implemented at the end of the semester, in an Educational Sciences Course which resembles courses offered in Social Sciences Departments more, the teaching-learning habits of pre-service teachers might have affected the way students perceived the classroom environment. Similarly, Coll, Taylor, & Fisher (2002) unearthed that tertiary level science students from 12 different ethnicities also perceived their classes as highly teacher dominated and these teachers are perceived as highly authoritative instead of persons who are valuing student freedom and responsibility.

In the Classroom Teaching and Turkish Language Teaching Departments, mostly a personalized approach to teaching and learning is adopted. It can be said that in these departments the frames of knowledge are quite unclear. For example, in the Turkish Language Teaching Department, each pre-service teachers make their understanding when they read a poem, a novel, or see a theater performance. In addition to these, pre-service teachers direct their learning in most courses. They are free to read as many

novels or books related to their subject. As similar to the expressions of Biggs (1970), performance in the faculties of Social Sciences is governed mostly by students' level of interest in the tasks. Hence, similar to Mathematics Teaching and Science Teaching Departments, although the scale was administered in an educational sciences course at the end of the semester, their teaching-learning habits might have affected the way they perceived the classroom environment.

These findings are similar to the study conducted by Hearn & Moos (1978) who divided high school classes into five types using the Holland typology and found that mathematics and science classes tended to get higher scores on task orientation and teacher control dimensions of classroom environment but they have a low level of involvement, affiliation, and cooperation dimensions of the classroom environment. On the other hand, social sciences classes de-emphasized task orientation, rule clarity, and teacher control dimensions of the classroom environment. Similarly, Atbas (2004) found that teacher support and involvement were significant predictors of English preparatory class students' achievement. However, the perceptions of learners may be affected by culture, teaching-learning approaches and methods since Chionh & Fraser (2009) found teacher support, task orientation as some of the dimensions of the classroom environment contributing to positive 10th-grade geography and mathematics classroom learning environments in Singapore.

Discussion about the Results concerning the Correlations among the Achievement Scores of Pre-Service Teachers and their Perceptions about different dimensions of Classroom Environment

In the current study, several correlations were obtained among the dimensions of the classroom environment and also between the achievement scores of pre-service teachers and their classroom environment perceptions. Of the classroom environment variables, task orientation, and involvement dimensions of classroom environment were highly correlated in the Elementary Classroom Teaching, Turkish Language Teaching, and Science Teaching Departments. It can be said that as pre-service teachers perceive that when the instructor had pre-arranged activities for them and they are required to complete the planned tasks related to the course, they become more willing to participate in different activities like class discussions, making extra research, and doing additional studies. Moreover, in the Elementary Mathematics Teaching Department, the highest correlation was obtained between cooperation and involvement dimensions of the classroom environment. It can be said that the more pre-service teachers cooperated, the more they are involved in course activities and vice versa. Similarly, Telli, Cakiroglu, & den Brok (2006) revealed that high school students perceived their biology classes highly task-oriented, moderately cohesive, cooperative, and equitable. Students informed that they perceived less teacher support, involvement, and investigation properties of the classroom environment. Also, the results revealed that the investigation and task orientation properties of the classroom environment were positively related to students' attitudes towards Biology. Similarly, Velayutham &

Aldridge (2013) found that the student cohesiveness and task orientation dimensions have a significant effect on science learning. In addition, Zandvliet (1999) found strong relations between the classroom environment scales of autonomy, independence, task orientation, and satisfaction of students. In the study of Strayer (2007), introductory statistics of the undergraduate students in the college-level indicated that they were less satisfied with the task orientation property of flipped learning classroom environment but more open to cooperative learning and innovative teaching methods. Again, it can be said that classroom environment perceptions of learners are affected by context and their perceptions may change according to course, teaching methods, and grade level.

Moreover, in the current study, difficulty dimensions of the classroom environment significantly correlated with different dimensions of the classroom environment in a negative direction. For example, if pre-service teachers perceived the tasks as hard, they had become less willing to participate in different activities. In addition, the more pre-service teachers cooperated, the more decrease has been observed in the perceived difficulty of tasks, and vice versa. Similarly, Majeed, Fraser, & Aldridge (2002) implemented a classroom environment scale to assess the secondary students' perceptions in the mathematics classroom environment in Brunei Darussalam. The findings showed that as students perceived less difficulty and less competition, they perceived more satisfaction. Moreover, they found a stronger positive association between student cohesiveness and satisfaction.

About the relationships between the course achievement and the perceptions of the classroom environment in the Elementary Classroom Teaching and Science Teaching Departments, the classroom environment perceptions of pre-service teachers did not significantly correlate with the achievement of pre-service teachers. In the Turkish Language Teaching Department, cooperation and student cohesiveness dimensions of the classroom environment showed significant and positive correlations with the course achievement. For this department, it can be said that if the pre-service teachers perceive the cooperation and students cohesiveness dimensions of the classroom environment to a higher degree, they will obtain higher course grades and vice versa. In other words, as pre-service teachers have intimate relationships, help each other, and cooperate rather than competing while conducting tasks, they obtain higher grades. Similarly, Chionh & Fraser (2009) found that positive perceptions about the classroom environment were associated with higher achievement in high schools of Singapore. Higher exam scores were observed in classrooms that were perceived to have a high level of student cohesiveness.

In the Elementary Mathematics Teaching Department, different from the other departments the achievement of pre-service teachers significantly correlated with classroom environment dimensions in a positive direction except for difficulty dimension. In other words, as pre-service teachers obtain higher grades in the courses, their perceptions of the classroom environment also become more favorable in the Elementary Mathematics Teaching Department and vice versa. Similarly, Kingir, et al.

(2013) found that students who interacted with each other to improve their understanding have demonstrated higher academic performance. Malik & Rizvi (2018) found the involvement dimension of the classroom environment as one of the major predictors that contributes to a positive classroom learning environment and students' academic achievement in Mathematics classrooms. Roth (1998) found that the unit test scores correlated significantly with some dimensions of classroom environment scale and those dimensions were autonomy, student-centeredness, and students' prior knowledge measures.

Although pre-service teachers in the Mathematics Teaching Department obtained higher course achievement scores, their scores in satisfaction, involvement, and task orientation dimensions of classroom environment were lower, and difficulty perceptions of the classroom environment was higher than those who enrolled in other departments. In most school systems mathematics and science instruction conducted in classes through lecturing. In other words, they are not taught in isolation but rather in the presence of other pupils with the instructor (Ben-Chaim, Fresko & Carmeli, 1990). Hence, the cooperation, involvement, and task-orientation dimensions of the classroom environment should be stressed to create a positive classroom environment and obtain better learning outcomes. In this way, the satisfaction of pre-service teachers may increase, and the perceived difficulty of the classroom environment decreases in these classes.

Limitations and Implications

These findings might provide useful information on how pre-service teachers perceive various dimensions of the psychosocial classroom environment in teacher training classes and inform instructors about how to organize classrooms to provide a positive classroom environment for different departments.

In the current study, although Elementary Mathematics students obtained the highest achievement scores, their classroom environment perceptions were not as favorable as the ones who are enrolled in other departments. For this reason, it may be suggested that to create a positive classroom environment and high-level of learning for pre-service teachers from all departments, different teaching methods, and materials such as group work, discussions, different software, and educational games should be included in the teaching-learning process instead of the instructor presentations, which may also increase the perceived involvement cooperation, student cohesiveness, satisfaction, task-orientation properties of the classroom environment and decrease the perceived difficulty property of the classroom environment.

The results of the research reported in this study were obtained from a state university located in Aegean Region. Thus, the sample might not properly be representative of all universities and faculties in Turkey. As also stated by Hearn & Moos (1978), the perceived classroom environment may vary according to subject matters and there is a need for studies investigating classroom environment within various subject areas in

different departments. Future studies may investigate whether the pre-service teachers' success indicators like achievement, academic self-efficacy, self-directed learning readiness might be improved by creating positive classroom environments in different courses by including different teaching methods and materials.

Furthermore, it might be suggested that those who wish to develop curricula and improve students' achievement should gather information about the classroom environment perception of learners and investigate its effects on students' academic outcomes in different courses.

Finally, future studies might combine quantitative and qualitative methods while investigating classroom environment perceptions of learners. In this way, the benefits of multiple research methods would be included and this might help researchers to understand the classroom environments deeply concerning different aspects of the classroom environment to foster better learning opportunities.

References

- Afari, E., Aldridge, J. M., Fraser, B. J., & 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
- Arısoy, N. (2007). *Examining 8th grade students' perception of learning environment of science classrooms in relation to motivational beliefs and attitudes* (Master's thesis). Middle East Technical University, Ankara.
- 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* (Doctoral dissertation). Middle East Technical University, Ankara.
- Baek, S. G., & Choi, H. J. (2002). The relationship between students' perceptions of classroom environment and their academic achievement in Korea. *Asia Pacific Education Review, 3*(1), 125-135.
- Biggs, J. B. (1970). Faculty patterns in study behavior. *Australian Journal of Psychology, 22*(2), 161-174. DOI: 10.1080/00049537008254570
- Ben-Chaim, D., Fresko, B., & 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
- 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). Curtin University of Technology, Australia.
- Chionh, Y. H., & 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
- Coll, R. K., Taylor, N., & 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: Pearson.
- Dorman, J. P., Adams, J. D., & 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>
- Dorman, J. P., Aldridge, J. M., & Fraser, B. J. (2006). Using students' assessment of classroom environment to develop a typology of secondary school classrooms. *International Education Journal*, 7(7), 906-915. Retrieved from <https://files.eric.ed.gov/fulltext/EJ854348.pdf>
- Dotterer, A. M., & Lowe, K. (2011). Classroom context, school engagement, and academic achievement in early adolescence. *Journal of Youth and Adolescence*, 40, 1649-1660. doi: 10.1007/s10964-011-9647-5
- Field, A. P. (2009). *Discovering statistics using spss*. (3rd ed.). London: SAGE Publications.
- Fraenkel, J. R., & Wallen, N. E. (2009). *How to design and evaluate research in education* (7th ed.). New York: 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. Retrieved from <https://doi.org/10.1023/A:1009932514731>
- Fraser, B. J., Anderson, G. J., & 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., & Fisher, D. L. (1983, April). *Assessment of classroom psychosocial environment*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Dallas, TX. Retrieved from <https://files.eric.ed.gov/fulltext/ED228296.pdf>
- Fraser, B. J., McRobbie, C. J., & Fisher, D. (1996). Development, validation and use of personal and class forms of a new classroom environment questionnaire. *Proceedings Western Australian Institute for Educational Research Forum*. Retrieved from <http://www.waier.org.au/forums/1996/fraser.html>
- Fraser, B. J., & Treagust, D. F. (1986). Validity and use of an instrument for assessing classroom psychosocial environment in higher education. *Higher Education*, 15, 37-57. Retrieved from <http://www.jstor.org/stable/3446741>
- Fraser, B. J., Treagust, D. F., & Dennis, N. C. (1986). Development of an instrument for assessing classroom psychosocial environment at universities and colleges. *Studies in Higher Education*, 11(1), 43-54. doi: 10.1080/03075078612331378451.

- Fresko, B., Carmeli, M., & 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. Retrieved from <https://doi.org/10.1080/00220671.1989.10885927>
- Goh, S. C., & Fraser, B. J. (1995, April). *Learning environment and student outcomes in primary mathematics classrooms in Singapore*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. Retrieved from <https://files.eric.ed.gov/fulltext/ED389627.pdf>
- Goh, S. C., & 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
- Hearn, J. C., & Moos, R. H. (1978). Subject matter and classroom climate: A test of Holland's environmental propositions. *American Educational Research Journal*, 15(1), 111-124.
- Kim, H. B., Fisher, D. L., & Fraser, B. J. (1999). Assessment and investigation of constructivist science learning environments in Korea. *Research in Science and Technological Education*, 17(2), 239-249. doi: 10.1080/0263514990170209
- Kim, H. B., Fisher, D. L., & Fraser, B. J. (2000). Classroom environment and teacher interpersonal behavior in secondary science classes in Korea. *Evaluation & Research in Education*, 14(1), 3-22. doi: 10.1080/09500790008666958
- Kingir, S., Tas, Y., Gok, G., & Sungur-Vural, S. (2013). Relationships among constructivist learning environment perceptions, motivational beliefs, self-regulation and science achievement. *Research in Science & Technological Education*, 31(3), 205-226. Retrieved from <http://dx.doi.org/10.1080/02635143.2013.825594>
- 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.
- Lee, C. K. J., Lee, L. M. F., & Wong, H. W. (2003). Development of a classroom environment scale in Hong Kong. *Educational Research and Evaluation*, 9(4), 317- 344. Retrieved from <http://dx.doi.org/10.1076/edre.9.4.317.17813>
- Malik, R. H., & Rizvi, A. A. (2018). Effect of classroom learning environment on students' academic achievement in mathematics at secondary level. *Bulletin of Education and Research*, 40(2), 207-218.
- Majeed, A., Fraser, B. J., & Aldridge, J. M. (2002). Learning environment and its association with student satisfaction among mathematics students in Brunei Darussalam. *Learning Environments Research*, 5, 203-226. Retrieved from <https://doi.org/10.1023/A:1020382914724>
- Nix, R. K., Fraser, B. J., & Ledbetter, C. E. (2005). Evaluating an integrated science learning environment using the constructivist learning environment survey. *Learning Environments Research*, 8, 109-133. doi: 10.1007/s10984-005 7251-x
- O'Reilly, R. (1975). *Classroom climate and achievement in secondary school mathematics classes*. Article retrieved from <https://tinyurl.com/y9oxaafn>
- Ozudogru, M. & Aksu, M. (2019). The development of classroom environment perceptions scale for pre-service teachers. *Ankara University Journal of Faculty of Educational Sciences*, 52(3), 771-800. doi: 10.30964/auebfd.487734,

- Peters, M. L. (2013). Examining the relationships among classroom climate, self efficacy, and achievement in undergraduate mathematics: A multi-level analysis. *International Journal of Science and Mathematics Education*, 11(2), 459-480. Retrieved from <https://doi.org/10.1007/s10763-012-9347-y>
- Ramsden, P. (1979). Student learning and perceptions of the academic environment. *Higher Education*, 8, 411-427.
- Reid, L. D., & Radhakrishnan, P. (2003). Race matters: The relation between race and general campus climate. *Cultural Diversity and Ethnic Minority Psychology*, 9(3), 263-275. doi: 10.1037/1099-9809.9.3.263.
- Rentoul, A. J., & Fraser, B. J. (1980). Predicting learning from classroom individualization and actual-preferred congruence. *Studies in Educational Evaluation*, 6(3), 265-277. Retrieved from [https://doi.org/10.1016/0191491X\(80\)90029-2](https://doi.org/10.1016/0191491X(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. Retrieved from <https://doi.org/10.1023/A:1009988732478>
- 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). The Ohio State University, Columbus.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (6th ed.). Boston: Pearson Education Inc.
- Taylor, P. C., Fraser, B. J., & Fisher, D. L. (1997). Monitoring constructivist classroom learning environments. *International Journal of Educational Research*, 27(4), 293-302. Retrieved from [https://doi.org/10.1016/S0883-0355\(97\)90011-2](https://doi.org/10.1016/S0883-0355(97)90011-2)
- Telli, S., Cakiroglu, J., & den Brok, P. (2006). Turkish secondary education students' perceptions of their classroom learning environment and their attitude towards Biology. In D. L. Fisher & M. S. Khine (Eds.), *Contemporary approaches to research on learning environments: World views* (pp. 517-542). Retrieved from <https://dspace.library.uu.nl/handle/1874/12656>
- Trickett, E. J., & Moos, R. H. (1973). Social environment of junior high and high school classrooms. *Journal of Educational Psychology*, 65(1), 93-102. Retrieved from <http://dx.doi.org/10.1037/h0034823>
- Velayutham, S., & 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.
- Wahyudi, W., & Treagust, D., F. (2004). Learning environment and students' outcomes in science classes in Indonesian lower secondary schools. *Journal of Science and Mathematics Education in Southeast Asia*, 27(1), 139-165. Retrieved from <https://pdfs.semanticscholar.org/3c31/1f40e4ab03e449dba436ce79f38cf66033b1.pdf>
- 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. Retrieved from <http://dx.doi.org/10.1037/a0027247>
- Yan, L. & Kember, D. (2003). Influence of the curriculum and learning environment on group learning approaches outside the classroom. *Learning Environments Research*, 6, 285-307.

Zandvliet, D. B. (1999). *The physical and psychosocial environment associated with classrooms using new information technologies: A cross-national study* (Doctoral dissertation). Curtin University of Technology. Retrieved from <https://espace.curtin.edu.au/handle/20.500.11937/2124>

In the writing process of the study titled “Assessing the Psychosocial Classroom Environment of Teacher Training Classrooms”, the rules of scientific, ethical and citation were followed; it was undertaken by the authors of this study that no falsification was made on the collected data. “Sakarya University Journal of Education Journal and Editor” had no responsibility for all ethical violations to be encountered, and all responsibility belongs to the authors and that the study was not submitted for evaluation to any other academic publishing environment.