LEARNER PERCEPTIONS OF BUILDING CONSTRUCTIVIST LEARNING ENVIRONMENTS IN SECONDARY SCHOOLS

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Abstract

The purpose of the present study is to examine the extent to which the learning environments in classes are appropriate for constructivist learning based on the perceptions of second-year students in secondary schools. The sample of the study was composed of 300 secondary school students studying at eight different secondary schools in Afyon, a provincial area in Turkey. "Constructivist Learning Environments Scale," developed by the researchers was used as the data collection instrument in this study. To analyze the data, SPSS 18 was used; descriptive statistics and t-test results were presented. According to the findings of the study, the participants stated that a constructivist learning and teaching environment is created in their classes. It was also seen that the difference between the mean scores of the boys and girls in the sub-dimension of reflection on constructivist learning environment was significant, while the difference between the total mean scores was not.

Keywords: Secondary school, secondary school students, constructivist instruction

INTRODUCTION

How people learn is a highly complex issue, so quite a few learning theories have been suggested to account for this phenomenon (Schunk, 2008). Viewing the notion of learning from its own perspective, each theory has put forward different views regarding the learning process (Senemoğlu, 2004). One of such theories trying to explain the learning process and to suggest different ideas about this issue is constructivist learning theory (Brooks & Brooks, 1999).

Constructivism is basically an epistemological view on how information is obtained rather than being a learning theory (Fosnot & Perry, 2007). However, constructivism is more readily accepted as a learning theory today. According to the constructivist learning theory, new knowledge is built upon what was previously learnt. This comes to mean that knowledge is organized so as to establish meaningful relations and units rather than random accumulation of knowledge (Brooks & Brooks, 1999). According to the proponents of constructivism, knowledge it is not free from the individual, it is context-bound and individual. The meanings which belong to a particular person cannot be transferred to others (Phillips, 2000). Constructivist learning involves an active process, in which individuals construct meaning by combining new knowledge with what they already have (Jones & Brader-Araje, 2002). Therefore, knowledge in constructivist understanding is not an imitation of the external world or passive transfer from one person to another (Phillips, 2000). In constructivist learning, the learner is not a passive recipient of the outside stimuli; he/she is the active creator of knowledge, who internalizes it. It is claimed that learning in constructivism is seen as a meaning-making process and that meaning is created by the learner rather than through instruction (Biggs, 1996). It is thought that learning in a constructivist sense is cyclical and holographic phenomenon in which it is difficult to understand how the variables affect each other and which is multivariate and full of activities supported by context-bound rich experiences (Yurdakul, 2004). In this respect, the individual in constructivist learning is responsible for his/her learning and is the person who chooses the most suitable options for him/herself (Abbott & Ryan, 1999).

According to the proponents of constructivism, learners create knowledge individually and reorganize it (Saban, 2009). Therefore, learning means appropriating knowledge rather than adopting it passively (Olssen,

1996). In constructivism, learners are not considered as empty boards or containers to be filled in; they are rather seen as active organisms that seek and create meaning (Olssen, 1996). What is important in constructivist learning is how the individual makes meaning out of knowledge rather than adopting it. The purpose of all efforts in constructivism is to ensure long-term retention of knowledge and to contribute to the formation of higher-order cognitive skills (Şaşan, 2002). Therefore, it is necessary to establish environments in which learners can interact and have rich learning experiences (Gagnon & Collay, 2001) because constructivism, which takes into account basic knowledge and skills, stresses such issues as reflection, understanding, questioning and application of knowledge (Moussiaux & Norman, 2003). During the learning process, the main purpose is to help learners seek their own meaning, make decisions, work in cooperation and learn using their higher-order thinking skills and creativity (Demirel, 2005). Proponents of constructivism believe that rich experiences can activate the learning process and positively affect the learning levels of students (Brooks & Brooks, 1999). In this respect, constructivist learning is based upon learners' problem solving, critical thinking and creativity processes (Fer & Cırık, 2007). In constructivist learning environments, it is suggested that learners actively get involved in meaning-making processes. In such environments, learners are seen as meaning hunters and problem solvers, while teachers are considered as counselors and facilitators that help learners construct knowledge and explore meaning rather than being knowledge providers (Dunlop & Grabinger, 1996).

Learning environments in which the constructivist learning approach is practiced entail learners' assuming more responsibility and being more active (Köksal, 2009). Such environments are organized in a way to help learners get involved in more interaction with their environments and thus have rich learning experiences. As a matter of fact, thanks to these environments, learners obtain the chance to test the truth of previously constructed knowledge, to correct mistakes and to replace old ideas with new ones (Yaşar, 1998). Therefore, constructivist learning environments are considered to be places where learning is possible with learners' intellectual activities and where research is carried out and problems are solved (Marlowe & Page, 1996). In other words, such environments lead to complexity. These environments should also include such issues as social agreement, attaching importance to multiple views, different learning types, assuming responsibility during learning and learners' awareness of themselves in constructing knowledge (Driscoll, 2000). It's obvious that constructivist approach does not deny the view that it is necessary to equip learners with certain knowledge and skills. However, its stresses that learners should reflect more, understand, take the responsibility of their own learning, and control their own behaviors (Saban, 2009). In this way, in learning environments suggested by constructivist learning approach, individuals have to assume more responsibilities and be more active (Gültekin, Karadağ & Yılmaz, 2007).

Our country got acquainted with constructivist learning approach, particularly during the development of primary school program in 2004. During the Republican period in Turkey, instructional programs were revised in 1924, 1926, 1936, 1948, 1962, 1968 and 1998 (Çelenk, Tertemiz & Kalaycı, 2000). Finally in 2004, the primary school programs were completely redesigned with a new perspective, and they were put into practice in 2005-2006 educational year. It was constructivism that formed the basis of these programs prepared with a new perspective (Turan, 2006). After this program was put into practice in 2005-2006 educational year, there was a significant increase in the number of studies on the constructivist learning approach in our country (DeVries & Betty, 1995; Taylor, Fraser & Fisher, 1997; Yaşar, 1998; Brooks & Brooks, 1999; Ziegler, 2000; Erdem, 2001; Yurdakul, 2004, 2005; Çınar, Teyfur & Teyfur, 2006; Gültekin, Karadağ & Yılmaz, 2007; Erdamar & Demirel, 2008; Yıldırım & Dönmez, 2008; Ünal & Çetinkaya, 2009; Argün & Aşkar, 2010, Bakla, 2011). Though a great majority of such studies presented positive findings about the constructivist learning approach, they mostly focused on the comparison of the constructivist approach and traditional learning approaches. They aimed to identify the impact of instruction based on constructivist learning principles on learners' various characteristics. However, there are almost no studies on the extent to which present classrooms reflect the principles of constructivism and perceptions of this (Altun & Büyükduman, 2007). The assessment of constructivist learning environments is significant in terms of identifying shortcomings and developing learning environments, but there are not enough studies focusing on the evaluation of such environments in terms of the extent to which they bear the characteristics of constructivism (Argün & Aşkar, 2010).

Therefore, in this study, which aims to investigate the views second-grade students in secondary schools on constructivist learning environments, "Based on the perceptions of secondary school second-grade students, what is the extent to which learning environments in the current classrooms bear the characteristics of constructivism?" is presented as the research problem. In this context, the answers to the research questions below were sought.

1. How suitable are the learning environments for constructivist learning according to the perceptions of secondary school second-grade students?
2. Is there a significant difference between the mean constructivist learning environment scores of secondary school second-grade students according to the gender variable?

METHOD

This study aims to identify the views of secondary school second-grade students on whether in-class learning environments are appropriate for constructivist learning. This study is a descriptive one because it tries to visualize the situation as it is. General survey model was used as the research methodology in this study. Survey models as research approaches intend to describe past or current situations as they are (Karasar, 1995). Moreover, the views of second-grade secondary school students on constructivist learning environments are compared in terms of gender. The study attempted to determine whether the male and female learners' views significantly differed in terms of the process of thinking, establishing relations with the real-life, learning and in-class processes. In this respect, the present study is a correlational one (Erkuş, 2005).

Population and Sample
The population of the study was composed of second-grade students studying in eight different state secondary schools with the same socio-cultural level in the province of Afyon. Since it was impossible to reach all of members in the population, the researchers selected a sample using disproportionate sampling. The survey forms of 21 out of 321 students, who responded to the survey, were eliminated since they were not properly filled out. Therefore, 300 students formed the sample of the present study.

Data Collection Tools
"The Constructivist Learning Environments Scale," developed by the researchers, was used as the data collection tool in the present study. This scale consists of 39 Likert items and four dimensions; that is, "reflection process," "establishing links with life," "learning process" and "in-class activities" (See Appendix-1). The KMO value of the scale was 0,944; Bartlett sphericity test result was found to be meaningful $[X^2=4407.159/sd=741, p<0.000]$ (Tavşancıl, 2005, Scherer, 1988). The Eigen value was accepted to be 1.00, and four factors with eigen values over 1.00 were determined (Büyüköztürk, 2002). There was a significant positive linear correlation at moderate level between the factors in the scale $r=.642$ $p<0.01$. The Cronbach alpha internal reliability coefficients of the scale ranged between 0.91 and 0.77, and the Cronbach alpha internal reliability coefficient for the scale was 0.96 (Anderson, 1988; Kline, 1994; Peers, 1996). As a result of confirmatory factor analysis X^2/sd rate was found to be 1.50 ($X^2/sd=1049.28/698$); GFI value was 0.78; AGFI value was 0.76; RMSEA value was 0.05; CFI value was 0.89; NFI value was 0.74 and NNFI value was 0.88. Though the analysis results for the scale were not perfect, they were within acceptable limits (Jöroskog & Sörbom, 1993; Schumacher & Lomax, 1996; Tabascnick & Fidell, 2001; Thompson, 2004; Kline, 2005; Brown, 2006).

The data were analyzed using a rating scale after the scale was administered. There are five options in each item in the scale. These options are "I Strongly Disagree" 1-1.79, "I Disagree" 1.80- 2.59, "I am undecided" 2.60-3.39, "I Agree" 3.40-4.19 and "I Strongly Agree" 4.20-5. The range coefficient for the four ranges (5-1=4) in this five-point Likert scale was (4/5) 0,80.

Data analysis
The data were analyzed using SPSS 18. The means and standard deviations of the learners' views on constructivist learning environment scores were calculated. To test whether there is a significant difference between learners' views across genders, independent samples t test was used.

FINDINGS

The First Sub-dimension

The first sub-problem of the study was "How suitable the learning environments in the classrooms for constructivist learning from the perspectives of secondary school second-grade students?"

Descriptive statistical data were examined to find an answer for this question. Table 1 presents the mean scores and standard deviations for the perceptions of secondary school students on how suitable the learning environments are for constructivist learning. When Table 1 is examined, it is observed that the views of the students were mostly expressed through three points of the Likert scale; that is, the points between "Undecided" (2.60-3.39) and "I Completely Disagree" (4.20- 5). In terms of the total scores obtained from the scale, the students expressed their opinions on the idea that their classroom is suitable for constructivist learning using the expression "I Agree" (83,86).

Table 1. Descriptive Statistics on Constructivist Teaching Environment

Activities	N	Mean	Std. Dev.
1.I do not refrain from sharing my emotions and opinions in the class.	300	3,90	1,17
2. I learn by working in cooperation with my teacher.	300	4,13	1,11
3. What is presented in the lessons arouses my interest.	300	3,94	1,11
4. The teacher checks my existing knowledge by asking some questions during transitional periods in the lessons.	300	3,95	1,11
5. I think that what I learn in the classes is precious.	300	4,22	1,11
6. Environments in which I can use what I learn in classes are created.	300	3,87	1,12
7. I can establish links between what I learn in the classroom and the possible situations that I can experience in real life.	300	3,98	1,20
8. What I learn in the classes make me reflect upon them.	300	3,87	1,22
9. I think that the evaluations made in the classroom contribute to my learning.	300	3,86	1,25
10. Our teachers use different methods to explain a particular issue.	300	3,91	1,19
11. During the classes new ideas, questions and problems come to my mind.	300	3,77	1,25
12. I can use what I learn in the classes in new situations.	300	4,02	1,11
13. My teacher helps me associate my pre-existent knowledge what I newly learn in the classes.	300	3,95	1,13
Reflection Process	**300**	**3,95**	**7,92**
14. The examinations given help me acquire new knowledge about a subject.	300	3,97	1,14
15. I think that what I learn in the classroom will be extremely useful for me in the future.	300	4,13	1,13
16. I can comfortably discuss what's taught in the classes with my peers and teachers.	300	3,93	1,22
17. I know where I can use what I learn in the classroom.	300	4,00	1,13
18. I can produce new solutions for a particular problem in the classes.	300	3,84	1,22
19. In the lessons, our teacher encourages us to work together helping each other.	300	4,01	1,07
20. I use various assessment forms to evaluate myself and my peers at the end of subjects/units in the lessons.	300	3,89	1,19
21. I have realized that I have to think over what I hear, see and read in the lessons.	300	3,91	1,19
22. It is essential that we use higher-order thinking skills instead of memorization in the lessons.	300	3,94	1,17
23. I have the chance to work in cooperation with my friends in the lessons.	300	3,93	1,25

The Process of Establishing Links with the Life	**300**	**3,95**	**6,33**
24. I can be more active than my teacher under his/her guidance in the lessons.	300	3,73	1,27
25. I challenge the answers that that I give in the lessons.	300	3,70	1,22
26. I can freely express my opinions in the lessons.	300	3,92	1,21
27. I'm aware that I'm responsible for my own learning in the classes.	300	3,86	1,29
28. I learn by making use of realia and reallife situations in the lessons.	300	3,85	1,20
29. My teacher uses various materials, tools and equipment to help me learn better in the lessons.	300	3,70	1,28
30. I'm allowed to be involved in deep reflection while thinking about an issue in the lessons.	300	3,75	1,20
31. I can easily share my emotions and opinions about the subjects taught in the lessons.	300	3,73	1,22
32. Project work is often carried out in the lessons.	300	3,75	1,23
33. My teacher wants to learn what I think while preparing lesson plans.	300	3,84	1,22
34. There is a high level of student-teacher and student-student interaction in the classroom.	300	3,75	1,31
Learning Process	**300**	**3,78**	**7,24**
35. I'm given the opportunity to evaluate my peers in group work activities in the classroom.	300	3,76	1,20
36. My friends' and my ideas are respected in the classroom.	300	3,69	1,25
37. Interesting and up-to-date subjects are taught in the classes.	300	3,70	1,29
38. My teacher guides me in exploring a subject which I don't know.	300	3,66	1,33
39. We have lessons not only in the classroom but also in other locations.	300	3,35	1,41
In-class processes	**300**	**3,63**	**4,46**
Total	**300**	**3,86**	**17,9**

The mean score for learners' responses to the item "I think that what I've learned in the classroom is precious" was 4,22, which was the highest score among the items, while the mean scores for responses to the item "We have lessons not only in the classroom but also in other locations" was 3,35, the lowest score among the items. When the scores are examined in terms of the sub-dimension, it is seen that the mean score is 3,95 for "reflection process," 3,95 for "establishing links with life," 3,78 for "learning process" and 3,63 for "in class activities."

The Second Sub-Problem
The second research question is "Is there a significant difference between the mean constructivist learning environment scores of secondary school second-grade students according to the gender variable?" For this research question the alternate hypothesis H1 was formulated as follows: H1= There a significant difference between the mean constructivist learning environment scores of boys and girls.

Table 2 presents the scores for "reflection" sub-dimension and "constructivist learning environment total" scores obtained as a result of statistical analyses carried out to test this hypothesis. Since there were not significant differences between the mean scores for the sub-dimensions "establishing links with life," "learning" and "in-class activities," the related data are not given in the table. It is seen that in terms of "reflection" sub-dimension and total scores, the mean scores of male secondary school second-grade students were higher than those of female students.

Table 2. T-test results presenting the correlation between gender, and students' constructivist learning environment scores

		N	Mean	Std.Dev.	sd	t	p
Reflection	Male	154	52,41	7,87	298	2,274	,024
	Female	146	50,34	7,86			
Constructivism	Male	154	152,48	17,60	298	1,679	,094
Total	Female	146	149,01	18,14			

However, independent samples t-test was carried out to identify whether this difference was random, or it was an indication of secondary school second-grade students'constructivist learning environment scores, and the degree of freedom (df), t-test (t) value and significance level (p) were examined.

In Table 2, it is observed that the p value of the independent samples t-test for secondary school second-grade students'constructivist learning environment scores is 0,094. The total scores with respect to gender do not significantly differ since significance value is higher than the 0.05 significance level. Though the difference was insignificant, that mean score of boys is higher in comparison with that of girls.

In Table 2, it is observed that the p value of the independent samples t-test for secondary school second-grade students'constructivist learning environment score for the sub-dimension "reflection" is 0,024. Since this value is smaller than the significance level (0.05), there is a statistically significant difference between the scores of boys and girls for "reflection" sub-dimension (p < 0,05) at the 0.05 statistical significance level. This difference is in favor of the boys.

DISCUSSIONS AND INTERPRETATIONS

According to the perceptions of secondary school second-year students, the mean scores of learners' views on the extent to which learning environments are suitable for constructivist learning were (2.60-3.39) for "I am undecided" and (4.20- 5) for "I strongly Disagree." Learners' not choosing "I strongly Disagree" and "I Disagree" might show that teachers try to create constructivist learning environments in their classrooms and they are successful in doing so to a certain extent.

When the total score obtained from the scale is considered, the students thought that their classroom was suitable for constructivist teaching mostly by using the option "I agree" (3,86). The use of this option by the majority of the students rather than the use of "I certainly agree" shows that classrooms should be developed to create better constructivist learning environments.

When the mean scores are examined in terms of the sub-dimensions, it is seen that the mean score is (3.95) for "reflection process," (3.95) for "establishing links with the life," (3.78) for "learning process" and (3.63) for "in-class activities" sub-dimensions. Having the same mean score for the "reflection" and "establishing links with the life" sub-dimensions supports the idea that the activities related with "reflection" and "establishing links with the life" are well organized. The mean score for "in-class activities" sub-dimension is lower than that of other sub-dimensions. Therefore, we can say that "in-class activities" is a dimension that has to be developed in line with constructivist understanding.

When the findings related with the gender variable are examined, it is seen that the mean constructivist teaching environment scores of the boys is higher than that of the girls. This finding might mean that girls are different from boys in that they assess the classroom and the teacher differently and their expectations from the teacher and the classroom are different.

The findings obtained from this study are in line with those of a number of other studies on constructivism with positive findings (Erdem, 2001; Yurdakul, 2004, 2005; Çınar, Teyfur & Teyfur, 2006; Gültekin, Karadağ & Yılmaz, 2007; Erdamar & Demirel, 2008; Yıldırım & Dönmez, 2008; Ünal & Çetinkaya, 2009; Argün & Aşkar, 2010). In our country, elementary school program was completely renewed with a new perspective in 2004. During the

period when this program was put into practice in 2005-2006 educational year, a handful of studies on creating constructivist teaching environments found that teachers were unable to create adequate constructivist teaching environments in the classroom (Turan, 2006). The findings of the present study indicate that instructional programs developed according to constructivist approach are readily accepted and the requirements of such a program are partially met today. However, the learners' total score for constructivist teaching environment item in the questionnaire is not at the level of "I completely agree." This indicates that the efforts to create constructivist teaching environments are far from being perfect.

RESULTS AND RECOMMENDATIONS

The main components of the education phenomena are learner, teacher, instructional environment, instructional method and materials. Creating an appropriate instructional environment in the classroom is the task of the teacher rather than the student. In this respect, the following recommendations can be made to help teachers create a constructivist instructional environment.
- Research findings on creating constructivist teaching environments can be shared with school administrators and teachers to increase their awareness levels.
- Constructivist instruction and creating appropriate environments for it can be added to the programs of teacher training institutions to teach this issue at the practical level.
- Teachers who are successful in creating constructivist teaching environments can be rewarded by school managements.

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