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INVESTIGATING THE CORRELATION BETWEEN STUDENTS' PERCEPTIONS ON THE CONSTRUCTIVIST LEARNING ENVIRONMENT AND THEIR ACADEMIC SUCCESS IN SCIENCE COURSE WITH PATH ANALYSIS

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Abstract. *The purpose of this study was to investigate the correlation between the perceptions on the constructivist learning environment and academic success of elementary students in science course with structural equation modelling. The correlative investigation model was adopted in the research. The sample of the research consisted of 195 students from six public elementary schools, chosen according to random sampling method. In order to answer the research question, "The constructivist learning environment survey" (Taylor, Fraser & Fisher, 1997) was used in the study. Also, the data in relation with students' academic success in science course were gathered from their school report cards regarding the spring semester. In this research, LISREL 8.51 structural equation software was used in model establishing by using the observed variables. According to the findings obtained in the research, it was found out that the compatibility index results of the constructed equation model, the model-data compatibility was found out to be high enough [χ^2/df=1.46; GFI=0.86; CFI=0.93; RMSEA=0.048; RMR=0.078; SRMR=0.056; NFI=0.81; NNFI=0.92] in the research. In the regression equation, it was found out that the variable best predicting students' academic success in science course was the variable personal relevance in relation to the constructivist learning environment. On the other hand, it was understood that all five predictor variables that were included in the regression equation account for 76% of the overall variance of the academic success in science course in the research.*

Key words: *Constructivist learning environment, correlation, elementary students, science course.*

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Introduction

The way how people learn is a most complex phenomenon and many theories have been put forward on this very issue (Schunk, 2008). Each theory of learning defines the concept of learning from its own perspective and brings a different approach to the learning process (Senemoğlu, 2004). In this regard, learning theories can be categorised as objectivist and constructivist. The traditional learning theories can be called as objectivist and this approach states that knowledge depends on an objective reality and is an absolute entity. On the other hand, unlike the objectivist approach, constructivist approach emphasises that learning is the learners' construction of his/her own knowledge in his/her mind (Arısoy, 2007). Constructivism is one of the most popular learning theories which tries to explain the nature of learning (Brooks & Brooks, 1999). The way in which people try to make sense of situations or, in other words, how people create meaning, is the main concern of the constructivist learning theory (Loyens & Gijbels, 2008). According to some (Brooks & Brooks, 1999; Özden, 2005; Karadağ, 2007), constructivism is a paradigm shift in learning, education and schooling today.

As a result of the reform efforts in education all over the world, the practice of constructivism is viewed as an effective paradigm in the twenty-first century (Özgür, 2008). However, constructivism is not a new concept as it is viewed in the literature (Terhart, 2003). Many traces of constructivist thought can be found in history (Kinnucan-Welsch & Jenlink, 1998). It is a common belief that the concept constructivism was derived from Piaget's (1955) reference to his as constructivist, as well as Bruner's (1966) description of discovery learning and from Vytgotsky's (1978) views on social-cultural learning.

Constructivist learning is a philosophical view which is interested in arriving at knowledge rather than as another independent learning approach (Savery & Duffy, 1996). Constructivism as an epistemological philosophical view of knowledge acquisition emphasises knowledge construction rather than knowledge transmission (Fosnot, 1996). According to constructivism, knowledge construction is based upon learners' previous knowledge experiences. So, new knowledge is integrated with the previous intellectual constructs (Schunk, 2008). The general sense of constructivism is that it is a theory of learning or meaning making, that individuals create their own new understandings on their prior knowledge (Richardson, 2003). Thus, constructivism can be stated to be a view of learning that considers the learner as a responsible active agent in his/her knowledge acquisition process (Abbott & Ryan, 1999). In other words, constructivism is a learning theory contending that learners construct their own understanding based on prior learning and social interaction (Brooks & Brooks, 1999). Therefore, it is possible to state that constructivism is one of these theories which tries to explain the nature of learning (Brooks & Brooks, 1999). Constructivism is a psychological and philosophical perspective contending that individuals form or construct much of what they learn and understand (Schunk, 2008). The way in which people try to make sense of situations or how people create meaning is the main concern of the constructivist learning theory (Wilson, 1996).

Constructivism is an epistemological view of learning rather than teaching (Bodner, 1986). Therefore, constructivist learning applications predict a rich and interactive learning environment which supplies learner requires to reach knowledge, get and analyse it, arrange and use it in order to solve the problems (Gagnon & Collay, 2001). Constructivist learning is grounded in learners' active participation in the problem-solving, critical and creative thinking (Fer & Cırık, 2007). So, knowledge cannot be transferred from teachers to learners, it has to conceived (Von Glasserfeld, 1996). The essence of constructivism is that learners actively construct knowledge (Cunnigham, 1992). In the learning process, learners are expected to produce their own products by searching, doing decisions, collaborating, using high level of thinking skills and using their own creativeness (Demirel, 2005). Hence, constructivists believe that certain activities and enrichments in the environment can enhance the meaning-making process, such as active learning, using kinaesthetic, visual and auditory modalities, creating opportunities for dialogue, fostering creativity and providing rich, safe and engaging environments (Brooks & Brooks, 1999).

In the constructivist learning environment, learners are asked deliberately take action to create meaning from what they are studying. In other words, learners adopt the role of seekers and problem solvers while teachers become facilitators and guides rather than presenters of knowledge, learners learn how to use and apply information in diverse contexts (Dunlop & Grabinger, 1996). Also, the constructivist learning environment is a place where learners may work together and support each other as they use a variety of tools and information resources in their guided pursuit of learning goals and problem-solving activities (Wilson, 1996). The constructivist learning environment requires manipulation space that provides learners a sufficient area to research, experiment, and pose hypotheses with the problem (Jonassen, 1999). The activities in the constructivist learning environment are learner-centred and learners are encouraged to ask their own questions, carry out their own experiments, make their own analogies, and come to their own conclusions (Brooks and Brooks, 1999). The constructivist learning environment sustains an atmosphere which makes learners have lifelike experiences, flexible time and place for their effective learning in the classroom (Aygören, 2009). As with the constructivist learning environment, learners' needs, expectations and interests are met and learners' active participation in the learning process and social interaction amongst peers are promoted (Brooks & Brooks, 1999; Saban, 2004; Fer & Cırık, 2007; Karadağ & Korkmaz, 2007). In this regard, as the constructivists see the learners as the co-constructors of knowledge, they give importance to the perceptions of the learners about the learning environment to see the extent to which the constructivist approaches are met in the learning environment (Özkal, 2007).

In Turkey, the learning environment is usually teacher-oriented and follows a traditional route, where learners are usually passive receivers of knowledge and the teacher is the purveyor of it. In contrast to this view, constructivist educational design involves purposeful knowledge construction, multiple

representations of reality, and case-based learning environments rather than pre-determined instructional sequences and social interaction. Therefore as an alternative to traditional learning, constructivist learning has to be fostered in education (Altun & Büyükduman, 2007). During the 1990s, considerable interest has been generated in the design of constructivist learning environments (Land & Hannafin, 2000). In this context, it is seen that there are many studies on the constructivist learning environment (Taylor & Fraser, 1991; Honabein, Duffy & Fishman, 1993; Taylor, Fraser & White, 1994; DeVries & Betty, 1995; Honabein, 1996; Wilson, 1996; Taylor, Fraser & Fisher, 1997; Jonassen, 1999; Kim, Fisher & Fraser, 1999; Brooks & Brooks, 1999; Alridge et al., 2000; Tsai, 2000; Ziegler, 2000; Margianti, Fraser & Aldridge, 2001; Yurdakul, 2004; Yılmaz, 2006; Dündar, 2008; Özgür, 2008; Aygören, 2009; Bal & Doğanay, 2009; Acat, Anılan & Anagün, 2010; Anagün & Anılan, 2010; Argün & Aşkar, 2010; Aybek & Ağlagül, 2011; Narlı, 2011; Gökçe, İşcan & Erdem, 2012; Tatlı & Ayas, 2012) in the related literature. However, these studies focused on the descriptive aspect of the constructivist learning environments especially from the views of teachers. The studies carried out for the views of students on the constructivist learning environment are very limited and they also focused on the descriptive aspect of this learning environment (Altun & Büyükduman, 2007; Özgür, 2008; Özkal, Tekkaya & Çakıroğlu, 2009; Acat, Anılan & Anagun, 2010; İlgen, 2010). The research studies have provided consistent and convincing evidence that the quality of the classroom environment is a significant determinant of student learning (Fraser, 1994). It has been established that a positive learning environment is influential in student academic achievement and attitudes (Fisher, Henderson & Fraser, 1995). Previous researches have indicated that students' perceptions of learning environment are an important factor in explaining their cognitive and affective outcomes (Fraser, 1994). As far the previous researches on the constructivist learning environment are concerned, the number of the studies focused on the perceptions of the constructivist learning environment and academic success regarding science course has not been studied extensively in the related literature. On the other hand, the researches on the issue in Turkey have not been as intense as in abroad.

This research tried to investigate the correlation between students' perceptions on the constructivist learning environment and their academic success in science course with structural equation modelling. The research reported here also aimed to determine whether there were direct or indirect correlations between students' perceptions on the constructivist learning environment and academic success of elementary students in science course. The investigation of the correlation between students' perceptions on the constructivist learning environment and academic success of elementary students in science course is believed to contribute to policymakers, curriculum developers and teachers in order to design better elementary science curriculum.

Problem of Research

This research sought to improve the understanding of teachers on the constructivist learning environment in elementary schools. Hence, the findings obtained in the study may provide information for policymakers, educational administrators and curriculum developers as well as insights that may be relevant to similar studies elsewhere. In this regard, the purpose of this research was to investigate the correlation between the perceptions on the constructivist learning environment and academic success of elementary students in science course with structural equation modelling. Hence, the problem statement of the research was posed as, "What is the general structural equation model accounting for the correlations between elementary students' perceptions on the constructivist learning environment and their academic success in science course?" in the study. In order to investigate the correlations between elementary students' perceptions on the constructivist learning environment and their academic success in science course, the following research questions were posed in the study:

1. Is there a significant correlation between elementary students' perceptions on the constructivist learning environment and their academic success in science course?
2. What is the prediction level of elementary students' perceptions on the constructivist learning environment for their academic success in science course?

Methodology of Research

General Background of Research

The correlative investigation model was used in the research (McMillan & Schumacher, 2006). This model is one of the most commonly applied models in the related literature (Cohen, Manion & Morrison, 2003). The correlative investigation model is used to determine the correlation between different variables in educational and social research (Fraenkel & Wallen, 2000) and aims to identify the existence or level of coordinated change between two or more variables (McMillan & Schumacher, 2006). A structural equation model was formed in order to better illustrate the correlation between variables in the research (Brown, 2006). Structural equation model connects the predictive structural correlations holding between the variables in the regression model to the covered factor structures in the factor analysis through a comprehensive analysis (Sümer, 2000).

Sample of Research

The population of this study consisted of students in elementary schools within the borders of Nigde province of Turkey. Elementary schools are structured in two different parts. The classes from 1-5 are accepted as primary part of the elementary education, the classes from 6-8 are accepted as secondary part of the elementary education in Turkey. This study was carried out in the secondary part (classes from 6-8) of the elementary education. In order to detect the sampling of the study from elementary schools in cosmos, 195 students from six public elementary schools were chosen according to random sampling method (Karasar, 2005). In order to detect the sampling of the study, elementary schools in cosmos were chosen according to three-layer group sampling method according to socio-economic structure (high-middle-low) of their region (McMillan & Schumacher, 2006). The participants were assured for the anonymity and confidentiality for their responses in the study. Of the total, 93 (47.70%) of the students were females and 102 (52.30%) of the students were males. Also, 63 students (32.30%) were in the 6th grade, 71 of the students (36.21%) were in the 7th grade and 61 students (31.28%) were in the 8th grade in the research. The students participated in the research were between the ages of 12 to 14.

Instrument and Procedures

In this study, "the Constructivist Learning Environment Survey", developed by Taylor, Fraser and Fisher (1997) and translated and adapted into Turkish by Küçüközer et al. (2012) was used in order to collect data to answer the research questions in the research. The version used in this study had five sub-dimensions; *(i)* personal relevance, *(ii)* uncertainty, *(iii)* shared control, *(iv)* critical voice, and *(v)* student negotiation. The Cronbach Alpha's reliability coefficient was found as 0.84 and confirmatory factor analysis verified that the scale was compatible with the original form ($\chi 2/df$=2.34; GFI=0.92; AGFI=0.92; CFI=0.92; RMSEA=0.048). Additionally, it was detected that the corrected item-total correlations of the scale varied between 0.334 and 0.547. Also, the data in relation with students' academic success in science course were gathered from their school report cards regarding the spring semester of 2011-2012 academic year. The survey was anonymous and confidentiality of the students was ensured. Before administration, the purpose of the study was explained and the students were asked to be as fair as possible while responding to the items. Participation in this survey study was realised in the voluntary basis, and no promotion was given to the students. The necessary permission was obtained from students' parents and the parents of the students participated in the research were informed about the purpose of the research.

Data Analysis

In this research, LISREL 8.51 structural equation programme was used in model establishing by using the observed variables. In determining to what extent the suggested correlation patterns in the

research are compatible with the real data, chi-square (χ^2) suitability test, Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR), Standardised Root Mean Square Residual (SRMR), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Non-Normed Fit Index (NNFI) values were used in the current research.

Results of Research

In this part of the research, the correlation between students' perceptions on the constructivist learning environment and their academic success was presented. In this regard, the problem statement of the research was "What is the general structural equation model accounting for the correlations between elementary students' perceptions on the constructivist learning environment and their academic success in science course?" In order to answer the problem statement, perceptions on the constructivist learning environment were accepted as exogenous variable and academic success in science course was perceived as endogenous variable in the research. For this purpose, the linear correlations between students' perceptions on the constructivist learning environment and their academic success in science course were analysed with path analysis in the study. The path analysis in relation to the correlation between perceptions on the constructivist learning environment and academic success in science course was presented in Figure 1 below.

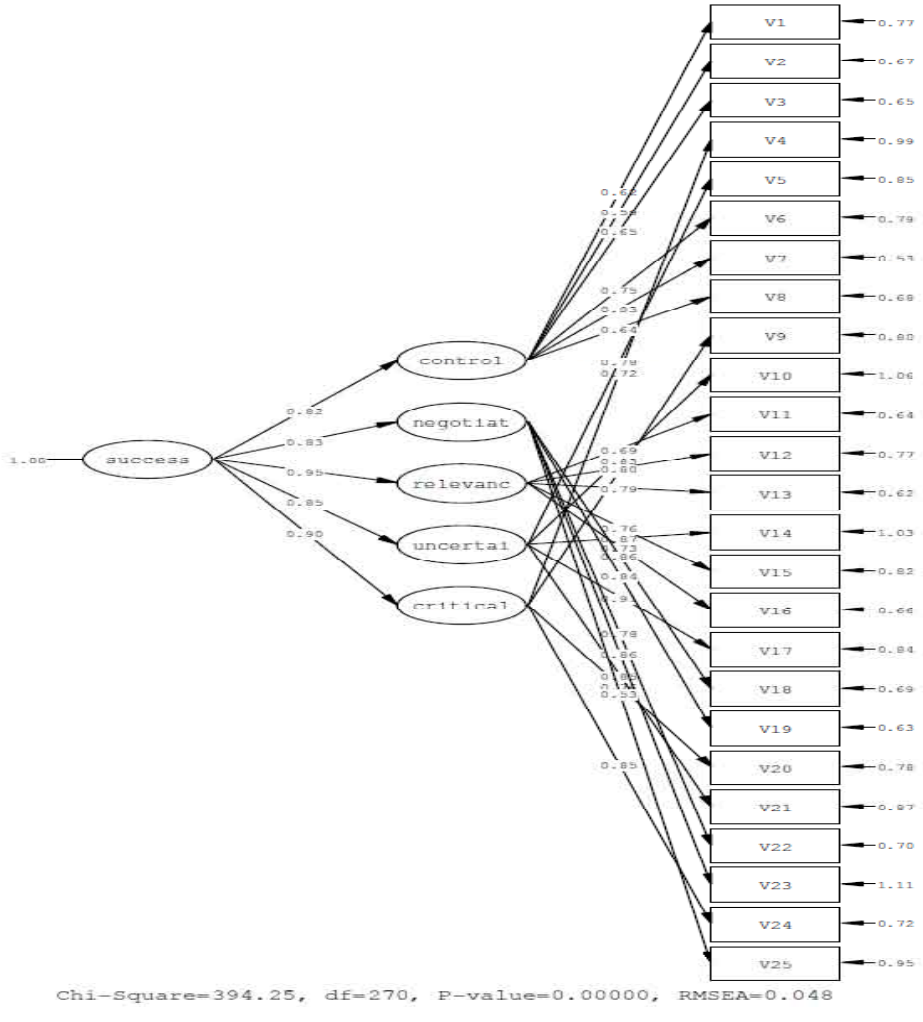

Figure 1: Path analysis in relation to the constructivist learning environment and academic success in science course.

As looked at Figure 1 above, it can be seen that there are five latent variables in relation to perceptions on the constructivist learning environment. On examining the compatibility index results of the constructed equation model, the model-data compatibility was found out to be high enough. As a result of path analysis, χ^2/df ratio was 1.46 (χ^2/df=394.25/270). In the study, GFI value was found out as 0.86 so that it can be perceived as sufficient. In this research, RMSEA value was found as 0.048 so that it is considered as an excellent goodness of fit. Besides, RMR value was found as 0.078 and SRMR value was found as 0.056 in the study. In this study, CFI value was found out as 0.93. Lastly, NFI value was 0.81 and NNFI value was found as 0.92 in this study.

On examining the structural equation modelling, it was seen that the variable best predicting elementary students' academic success in relation to the perceptions on the constructivist learning environment was personal relevance sub-dimension. It was found a linear positive significant high correlation between personal relevance sub-dimension to academic success in science course, where the correlation connection coefficient value was found as γ=0.95 in the research. It became evident that the second most crucial factor determining academic success in science course was critical voice sub-dimension in relation to the perceptions on the constructivist learning environment. The connection coefficient value was γ=0.90 in regard of critical voice sub-dimension of the perceptions on the constructivist learning environment. Besides, a linear positive correlation was found out between uncertainty sub-dimension in relation to the perceptions on the constructivist learning environment and academic success in science course, where the connection coefficient value was found as γ=0.85 in the research. It was found a linear positive significant high correlation between student negotiation sub-dimension to academic success in science course, where the correlation connection coefficient value was found as γ=0.83 in the study. Also, a positive significant linear correlation which was determined between academic success and shared control sub-dimension in relation to the perceptions on the constructivist learning environment in the model. The connection coefficient value was found out to be γ=0.82 in the model created. On the other hand, to determine the direct effect of the perceptions on the constructivist learning environment on academic success in science course at the level of sub-dimensions, a regression analysis was used. On examining the regression equation of the covered variables predicted by variables that were included in the structural equation model, the statement coefficient value of the model was found as 0.76 in the study. The model created [Academic Success= 0.89*Personal Relevance+0.90*Critical Voice+0.85*Uncertainity+0.83*Student Negotiation+0.82*Shared Control, Error var. = 0.24, R^2= 0.76] was found out to be statistically significant at p<.01 level in the research. In this regard, it can be well understood that all five predictor variables that were included in the regression equation accounted for 76% of the overall variance of the academic success in science course in the research. As can also be seen in the regression equation, the variable best predicting students' academic success in science course was the variable of personal relevance sub-dimension in relation to the constructivist learning environment. In addition, it can also be possibly said that critical voice, uncertainty, student negotiation, and shared control variables in relation to the perceptions on the constructivist learning environment predicted students' academic success in science course in a greater extend in the research.

Discussion

The purpose of this research was to investigate the correlation between perceptions on the constructivist learning environment and academic success of elementary students in science course. This research also aimed at constructing a structural equation model between perceptions on the constructivist learning environment and academic success in science course.

The findings of this research are crucial to note in two aspects. Firstly, the review of research on science course revealed that there are no comprehensive studies of students' perceptions on the constructivist learning environment and their academic success both in Turkey and abroad. From this aspect, the current study revealed the correlation between students' perceptions on the constructivist learning environment and their academic success in science course. However, previous researches also focused on the effects of constructivist learning approach on students' academic success. Unlike to the previous studies (Yurdakul, 2004; Çetin & Günay, 2007; Türker, 2010; Temiz, 2010; Yalçın & Bayrakçeken,

2010; Akyol, 2011), the correlation between perceptions on the constructivist learning environment and academic success in science course was firstly investigated together. In this regard, on examining the compatibility index results of the constructed structural equation model, the model-data compatibility was found out to be high enough in the research. According to the findings obtained in the research, it was found that χ^2/df ratio was 1.46 (χ^2/df=394.25/270) in the research. It is stated that a ratio equal to or lower than 2.5 in small samples (Kline, 2005) and a ratio equal to greater than 3 in large samples correspond to excellent goodness of fit in the related literature (Sümer, 2000). Besides this, it is stated that GFI and AGFI indexes equal to 1 means excellent goodness of fit in the literature (Schumacher & Lomax, 1996). In the study, GFI value was found out 0.86 so that it can be perceived as sufficient. RMSEA value equal to or lower than 0.05 means excellent goodness of fit (Brown, 2006; Jöreskog & Sörbom, 1993; Schumacher & Lomax, 1996; Çokluk, Şekercioğlu & Büyüköztürk, 2010). In this research, RMSEA value was found as 0.048 so that it is considered as an excellent goodness of fit. RMR and SRMR values are lower than 0.05 displays perfect model-data compatibility (Brown, 2006). In the study, RMR value was found out to be 0.078 and SRMR value was found as 0.056 so that it can be stated that they were the indicators of sufficient goodness of fit. CFI value equal to or greater than 0.95 means excellent goodness of fit (Thompson, 2004). In this study, CFI value was found out as 0.93 so that it can be considered as sufficient goodness of fit. NFI and NNFI values equal to or greater than 0.95 mean excellent goodness of fit in the related literature (Tabashnick & Fidell, 2001). Besides, NFI value was found as 0.81 and NNFI value was found as 0.92 in the research. Hence, these values can be perceived as sufficient goodness of fit.

On the other hand, on examining the structural equation modelling it was seen that the variable best predicting elementary students' academic success in relation to the perceptions on the constructivist learning environment was personal relevance sub-dimension. It became evident that the second most crucial factor determining academic success in science course was critical voice sub-dimension in relation to the perceptions on the constructivist learning environment. Besides, a linear positive correlation was found out between uncertainty sub-dimension in relation to the perceptions on the constructivist learning environment and academic success in science course. A positive significant linear correlation was determined between academic success and student negotiation sub-dimension in relation to the perceptions on the constructivist learning environment in the model. Also, a positive significant linear correlation which was determined between academic success and shared control sub-dimension in relation to the perceptions on the constructivist learning environment in the model. On examining the regression equation of the covered variables predicted by variables that were included in the structural equation model, the statement coefficient value of the model was found as (R^2) 0.76. It can be well understood that all five predictor variables that were included in the regression equation accounted for 76% of the overall variance of the academic success in science course in the research. As can also be seen in the regression equation, the variable best predicting students' academic success in science course was the variable of personal relevance in relation to the perceptions on the constructivist learning environment.

The association between learning environment variables and student outcomes has provided a particular rationale and focus for the application of learning environment (Fisher & Churach, 1998). In recent years science educators have led the way in investigating the effect of learning environment on student behaviour and academic success in school setting (Fraser & Walberg, 1991). In this context, it has been determined that a positive learning environment is influential in students' academic success (Fisher, Henderson & Fraser, 1995). Also, previous researches indicated that students' perceptions of learning environment are an important factor in explaining their cognitive and affective outcomes (Fraser, 1994, 1998). Besides, the use of student perceptions of classroom environment as predictor variables in several different countries established consisted correlations between the nature of the classroom environment and various student cognitive and affective outcomes (Haertel, Walberg & Haertel, 1981; Fraser & Fisher, 1982; Fraser, 1986; McRobbie & Fraser, 1993; Parker, 2009). Similarly, there are further studies indicating that a constructivist learning environment is associated with a variety of desirable student outcomes, such as academic success and attitudes (Fraser and Tobin, 1989; Tobin and Fraser, 1990; Fraser, 1994; Huffman, Lawrenz & Minger, 1997; Oh & Yager, 2004). Hence, it can possibly be stated that several studies indicated that the perception on the constructivist learning environment is a strong factor in determining and

predicting students' academic success at school (Fraser, 1994; Fisher, Henderson & Fraser, 1995). In other words, the constructivist learning environment generally shows a positive correlation with academic success at school. Thus, as can be seen from the findings obtained in the related literature in regard of the constructivist learning environment, there are significant correlations between perceptions on the constructivist learning environment and academic success of students. In general, the results obtained here indicated that the perceptions on the constructivist learning environment and academic success amongst Turkish students can be considered as rather positive. In this context, the results obtained in the literature can be said to be paralleled to the findings obtained in the current research.

The studies carried out in the related literature emphasised the importance of the correlations between constructivist learning environment and academic success. Students' perceptions on the constructivist learning environment are an important factor in explaining their cognitive outcomes (Fraser, 1994). It has been established that positive learning environment is influential in students' academic success in the classroom (Fisher, Henderson & Fraser, 1995). According to Sunal and Haas (2002), the classroom environment for meaningful learning can be obtained through joining the principles of constructivist learning with the roles of teachers and learners. Grounded constructivist learning environment, therefore, support individual or groups as they attempt to negotiate multiple rather than singular point of view, reconcile competing and conflicting perspectives and beliefs, and construct personally relevant meaning accordingly (Hannafin & Land, 1997). In typical constructivist learning environments, students establish learning goals and needs, navigate through and evaluate a variety of potentially relevant resources, generate and test hypotheses, and so forth (Land & Hannafin, 2000). In such an environment, the learner brings his/her social life experiences to the classroom, gathers evidence, establishes associations between his/her experiences, able to see his/her newly gained knowledge, skills and experiences from another perspectives. Additionally, the learners in such an environment feel confident and enrich their learning with adequate materials and experiences (Karaduman & Gültekin, 2007). Therefore, it might be suggested that activities should be done to raise students' perceptions on the constructivist learning environment at school. As a result of the current research carried out, it can be said that a positive linear correlation was determined between academic success and the perceptions on the constructivist learning environment in the model. In other words, it was found that academic success in science course increased in parallel to the increase in the perceptions on the constructivist learning environment. Hence, it might be recommended that teachers should design the teaching-learning environments according to the principles of constructivist learning approach. They should design a learning environment which supports collaborative study, face-to-face interaction, exploratory and project-based studies, discussion, etc. in the classroom. Further studies should also be carried out in order to better understand the role of the constructivist learning environment on the academic success in high school and/or university level of education with or without a comparison to elementary education.

Conclusions

According to the findings obtained in the study that, on examining the compatibility index results of the constructed structural equation model, the model-data compatibility was found out to be high enough [χ^2/df=1.46; GFI=0.86; CFI=0.93; RMSEA=0.048; RMR=0.078; SRMR=0.056; NFI=0.81; NNFI=0.92] in the research. On examining the structural equation modelling it was seen that the variable best predicting elementary students' academic success in relation to the perceptions on the constructivist learning environment was personal relevance sub-dimension. It became evident that the second most crucial factor determining academic success in science course was critical voice sub-dimension in relation to the perceptions on the constructivist learning environment. Besides, a linear positive correlation was found out between uncertainty sub-dimension in relation to the perceptions on the constructivist learning environment and academic success in science course. A positive significant linear correlation was determined between academic success and student negotiation sub-dimension in relation to the perceptions on the constructivist learning environment in the model. Also, a positive significant linear correlation which was determined between academic success and shared control sub-dimension in relation to the perceptions on the constructivist learning environment in the model. In conclusion, it

was understood that the variable best predicting students' academic success in science course was the variable of personal relevance in relation to the perceptions on the constructivist learning environment. On the other hand, on examining the regression equation of the covered variables predicted by variables that were included in the structural equation model, the statement coefficient value of the model was found as 0.76. It can be well understood that all five predictor variables that were included in the regression equation accounted for 76% of the overall variance of the academic success in science course in the research.

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