Teaching-Learning Conceptions and Academic Achievement: The Mediating Role of Test Anxiety

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Abstract

The current research aimed at examining the mediating role of test anxiety in the relationship between teaching-learning conceptions and academic achievement. The correlation investigation model was adopted in this research. The participants of the research were voluntering teachers ($n = 108$) and students ($n = 526$) from five different high schools. For data collection, the "teaching-learning conceptions scale" (Chan & Elliott, 2004), the "Westside test anxiety scale" (Driscoll, 2007), and the "Grade point average determination form" were used. The data was analysed using hierarchical multiple regression analysis. According to the results obained, it was found that there were significant relationships amongst teaching-learning conceptions, test anxiety, and academic achievement. Furthermore, it was concluded that test anxiety mediated the relationship between teaching-learning conceptions and academic achievement significantly.

Keywords: teaching-learning conceptions, test anxiety, academic achievement, correlation research.

Concepciones de Enseñanza-Aprendizaje y Rendimiento Académico: El Papel Mediador de la Ansiedad ante los Exámenes

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Resumen

El propósito de la presente investigación es examinar el papel mediador de la ansiedad ante exámenes en la relación entre concepciones de enseñanza-aprendizaje y el logro académico. La investigación adopta el modelo de correlación. Los participantes de la investigación fueron profesores ($n = 108$) y estudiantes ($n = 526$) voluntarios de cinco escuelas secundarias. Para la recolección de datos se emplearon la escala de concepciones de enseñanza-aprendizaje (Chan & Elliott, 2004), la "Westside test anxiety scale" (Driscoll, 2007), y la "Grade point average determination form". Los datos se analizaron mediante regresión múltiple jerárquica. De acuerdo con los resultados obtenidos, se encontró que existen relaciones significativas entre las concepciones de enseñanza y aprendizaje, la ansiedad ante los exámenes y el logro académico. Además, se concluyó que la ansiedad ante los exámenes medió la relación la relación entre las concepciones de enseñanza-aprendizaje y el rendimiento académico de manera significativa.

Palabras clave: concepciones de enseñanza-aprendizaje, ansiedad antes los exámenes, rendimiento académico, investigación de correlación.

Almost everyday, teachers have to take many different decisions affecting teaching and learning process in the classroom (Woolfolk, 2007). The decisions that teachers have to make almost everyday affect the teaching and learning process directly or indirectly, as well as in a positive or negative way (Kauchak & Eggen, 2007). Hence, the decisions that teachers make in regard to classroom processes affect instructional activities, and ultimately such situation becomes one of the determinants of effective teaching in the classroom (Borich, 2014). In this context, while the studies carried out in regard to this topic reveal that teachers' classroom behaviours are affected by many variables (Brophy, 1986; Evertson, Emmer, Clements, Sanford, & Worsham, 1984; Fang, 1996), the literature also reports that one of the most important variables affecting the decisions of teachers regarding classroom instruction is teaching-learning conceptions (Tilemma, 2000). Teaching-learning conceptions, also affected by many variables, such as prior school experiences, observations, personal beliefs, values, personalities, and instructional practices of teachers (Canbay & Beceren, 2012; Chan, 2004; Richardson, 2003), have become an issue attracting considerable attention of educational researchers in recent years (e.g., Aypay, 2011; Baş, 2014, 2015a; Chan, 2004; Chan & Elliott, 2004; Igwebuike, Okandeji, & Ekwevugbe, 2013; Teo & Chai, 2008).

While the growing interest in teaching-learning conceptions may be related to beliefs of teachers in classroom instructional practices (Chen, Brown, Hattie, & Millward, 2012), teaching-learning conceptions are defined as "the beliefs held by teachers about their preferred ways of teaching and learning. These include the meaning of teaching and learning and the roles of teacher and pupils" (Chan & Elliott, 2004, p. 819). In the relevant literature, teaching-learning conceptions are conceptualised under two conceptions based on different philosophical foundations (Chan, 2004; Chan & Elliott, 2004). Two conceptions based on different philosophical foundations can be defined, namely: (a) constructivist teaching-learning conception and (b) traditional teaching-learning conception (Chan & Elliott, 2004). These two conceptions symbolise diametrically opposed teaching-learning conceptions (Baş, 2015a). Teachers' pedagogical beliefs vary a long a continuum of considering teaching and learning as a process of knowledge

transmission at one end to a process of facilitating students' knowledge construction in the learning process at the other end (Chan & Elliott, 2004).

The traditional teaching-learning conception, also referred to teacher-centred instruction (Kember & Gow, 1994), sees learning as getting information from teachers and textbooks, considering the teacher as transmitter of knowledge as well as students as recipients of knowledge (Chan & Elliott, 2004). The traditional teaching-learning conception places much emphasis on teaching as transmission of corpus of knowledge from authoritative sources like teachers and textbooks to students as recipients of information (Igwebuike, Okandeji, & Ekwevugbe, 2013), who are expected to get all the information presented without questioning (Özden, 2005). Hence, knowledge is considered as a passive absorption of information transferred from teachers to students (Brooks & Brooks, 1999). While teachers are very active in the transfer of knowledge to students, students are in a very passive position in the construction of knowledge (Baş, 2014). Learning is considered as remembering and memorising (Engin & Daşdemir, 2015). For this reason, teachers who adopt this approach place themselves at the centre of the teaching and learning process, and mostly use traditional teaching methods in the classroom (Cheng, Chan, Tang, & Cheng, 2009), which might include some enforcement and punishment.

Participation of students in the teaching and learning process is very limited; they are not allowed to direct the teaching-learning process by themselves (Gagnon & Collay, 2001). At the same time, an instruction process in the classroom based on this type of conception focuses on the formation and shaping of students' behaviours by teachers (Barut, 2011). This approach is more associated with behaviourist theories (Woolfolk, 2007), according to which students' behaviours are expected to be introduced into a certain format and be disciplined (Prosser, Trigwell, & Taylor, 1994). A classroom based on a traditional teaching-learning conception can be characterized by authoritative classroom management (Yılmaz, 2009), as well as by custodial student control ideology (Baş & Beyhan, 2013), these being focuses of the classroom instructional process. Teachers tend to have the sole authority and the ultimate domination on all processes in the classroom (Jones & Harty, 1980). In other words, teachers organize teaching and learning processes by themselves, not allowing

students to share this responsibility (Jessup, 1995). Additionally, in classrooms where teachers adopt traditional teaching-learning conceptions students' individual differences are not taken into consideration; all students are considered to progress at the same time, pace, setting, and conditions (Fer & Cırık, 2007). Also, while in classrooms where teachers adopt traditional teaching-learning conception both classroom design and instruction stuck in a rut (Brooks & Brooks, 1999), teachers do not make an effort in order to differentiate instruction, as well they use simple methods of instruction based on transferring knowledge to students in a short period of time (Pritchard, 2015).

Moving apart from the traditional approach to instruction, the constructivist conception stresses the importance of experience and active learning processes that encourage discovery, collaboration and critical thinking by considering the teacher as a counsellor, as well as the student as an active participant (Chan & Elliott, 2004). While the traditional teaching-learning conception emphasises the transmission of knowledge from teachers to students (Özden, 2005), where teachers represent the authority of knowledge and students are viewed as passive recipients (Gagnon & Collay, 2001), the constructivist teaching-learning conception emphasises teachers as a guide who help students in the construction of knowledge as active participants of the learning process (Brooks & Brooks, 1999). This constructivist teaching-learning process reveals that knowledge cannot be seen as independent from the individual, so meanings belonging to the individual cannot be transferred to others (Phillips & Soltis, 2004). Given so, teachers are active counsellors helping students, facilitators and organisers of the teaching and learning process (Chan & Elliott, 2004), while students are in an active role of getting, explaining, and constructing knowledge (Baş, 2014). In this sense, a key feature of constructivist learning is not to get and accept knowledge given, but to infer meaning from the shared knowledge (Driscoll, 2000). Emphasis is placed in developing teaching strategies that are able to sustain the permanence of the learnt knowledge and to contribute to the development of higher-level cognitive skills in students (Duffy & Cunningham, 1996). At the same time, in classrooms where a constructivist teaching-learning conception is dominant, it is observed that students try to question, interpret, discuss, and compare the knowledge transferred to them

with other knowledge sources rather than just accepting them form teachers and textbooks (Marlowe & Page, 1998). This implies participating in teaching-learning process actively (Abbott & Ryan, 1999). In this regard, constructivist teaching fosters learning in students through problem solving, critical thinking, and creativity endeavours (Fer & Cırık, 2007). Besides, in classroom where teachers adopt constructivist teaching-learning conceptions a democratic environment is provided to students (Marlowe & Page, 1998), where teachers make a considerable effort to differentiate instruction (Tomlinson, 2014), taking individual differences of students into account and responding to them by using various contemporary methods and techniques of instruction in the classroom (Pritchard, 2015). Lastly, teachers who adopt constructivist teaching-learning conceptions in the classroom organise the classroom in constructivist ways and direct the instruction accordingly (Brooks & Brooks, 1999). Therefore, teachers adopting constructivist teaching-learning conceptions sustain learning environments that are rich in learning experiences in which they are just a guide in the meaning construction process performed by their students in the classroom (Gagnon & Collay, 2001).

The current research was aimed to extend the existing literature on instructional models and their impact on learning by considering academic achievement and test anxiety of students in the context of one powerful contextual factor, namely, the teaching-learning conceptions of teachers. While students' academic achievement levels may be affected by numerous variables including socio-economic status, general ability level, teaching-learning conception of teachers, quality of peer group of the student, extra learning opportunities, etc. (see Borich, 2014; Kauchak & Eggen, 2007), amongst these variables, teachers' teaching-learning conceptions is considered as one of the most significant factors (Chan & Elliott, 2004). Nonetheless, when the relevant literature is reviewed, a few studies are seen to examine teaching-learning conceptions of teachers in regard to some other learning variables (e.g., Aydın, Tunca, & Şahin, 2015; Aypay, 2011; Baş, 2015a; Baş, & Beyhan, 2013; Bıkmaz, 2011; Boulton-Lewis, Smith, McCrindle, Burnett, & Campbell, 2001; Chan & Elliott, 2004; Engin & Daşdemir, 2015; Eren, 2009). Particularly, the few studies that examine the relationship between students' academic achievement levels and teachers'

teaching-learning conceptions use to adopt qualitative research methods (e.g., Donche, De Maeyer, & Van Petegem, 2007; Gow & Kember, 1993). Thus, the use of quantitative methods to approach this research question would complete such qualitative explorations. Also, despite there are a few studies examining the relationship between academic achievement and test anxiety levels of students (e.g., Carden, Bryant, & Moss, 2004; Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi, & McCann, 2005; Culler & Holahan, 1980; Fincham, Hokoda, & Sanders, 1989), the relationship between teaching-learning conceptions and academic achievement with the mediating role of test anxiety in this context is not present in the relevant literature. While teachers' teaching-learning conceptions might have an impact on the academic achievement levels of students, test anxiety may have a significant role in the relationship between those two variables. Because testing is a much present reality in schooling today (McDaniel, Anderson, Derbish, & Morrisette, 2007), this variable (test anxiety) is considered to have a mediating impact in the relationship between teaching-learning conceptions adopted by teachers and the levels of academic achievement of students.

The present study aimed to examine the relationship between teachers' traditional or constructivist teaching-learning conceptions, as well as the mediating role of test anxiety, on the levels of academic achievement of students. It is posited that teaching-learning conceptions of teachers have a significant effect on students' academic achievement levels, and that test anxiety mediates the impact of teaching-learning conceptions adopted by teachers on students' academic achievement levels.

Purpose of the Study

The purpose of this research was to examine the mediating effect of test anxiety on the relationship between teaching-learning conceptions of teachers and academic achievement levels of students. In accordance with this aim in the current research, answers to the following questions were sought:
(1) Are there any significant relationships amongst teaching-learning conceptions, academic achievement, and test anxiety?

(2) Does test anxiety mediate the relationship between teachers' teaching-learning conceptions and students' academic achievement?

Methodology

Research Design

The correlation investigation model was adopted in this research (Fraenkel & Wallen, 2009). In the related literature, the correlation model is defined as a research model aiming to determine the existence or the level of mutual change of two or more variables (Creswell, 2012). In the current research, the relationships amongst teachers' teaching-learning conceptions, academic achievement, and students' test anxiety levels were examined by using the correlation investigational model.

Participants

The participants of the research were volunteering teachers ($n = 108$) and students ($n = 526$) from five different high schools in the province of Nigde in Turkey. Among the teachers, 43.52% ($n = 47$) were males and 56.48% ($n = 61$) were females. The occupational experience of the teachers in the study ranged between 1-5 and more than 20 years. The age range of the teachers was 24 to 56 years ($M = 36$, $SD = 2.64$). Regarding the participant students, 45.63% ($n = 240$) were boys and 54.37% ($n = 286$) were girls. With regards to class level, students were between the 9th and 12th grades. The students' ages ranged from 13 to 18 ($M = 16.4$, $SD = 3.48$).

Data Collection Tools

Teaching-Learning Conceptions Scale (TLCS). In order to examine the teachers' teaching-learning conceptions, "Teaching-Learning Conceptions Scale", developed by Chan and Elliott (2004) and adapted into Turkish by Aypay (2011), was used. The teaching-learning conceptions scale consisted of 30 items. The participants responded on a 1 (totally disagree) to 5 (totally

agree) scale; scores were averaged. The scale consisted of two sub-dimensions; (a) traditional teaching-learning conception (18 items; e.g., "Good students keep quiet and follow teacher's instruction in class"; α = .83), (b) constructivist teaching-learning conceptions (12 items; e.g., "It is important that a teacher understands the feelings of the students"; α = .88). The confirmatory factor analysis results (GFI = .93; AGFI = .91; RMR = .50; RMSEA = .54) revealed that the scale had acceptable values to be used in the current study (Aypay, 2011).

Westside Test Anxiety Scale (WTAS). In order to examine students' test anxiety levels in the research, the "Westside Test Anxiety Scale", developed by Driscoll (2007) and adapted into Turkish by Totan and Yavuz (2009), was used. The Westside test anxiety scale was consisted of 11 items. The participants responded on a 1 (totally disagree) to 5 (totally agree) scale; the scores were averaged to form test anxiety levels of students. The scale consisted of a single factor (11 items; e.g., "During important exams, I think that I am doing awful or that I may fail"; α = .89). The confirmatory factor analysis results (GFI = .93; CFI = .97; IFI = .97; RMSEA = .45) revealed that the scale had acceptable values to be used in the current study (Totan & Yavuz, 2009).

Grade Point Average Determination Form (GPA). In order to determine high school students' academic achievement levels, grade point averages (GPA) of the participating students at the end of the academic year were employed. The GPA results of the students were collected through the e-school system (see http://e-okul.meb.gov.tr) of the Ministry of National Education (MoNE) of Turkey by getting permission from the school administrations. A Microsoft© Office Excel® 2007 form was designed. Then, the school administrations were asked to transfer the GPA results of the selected grade and class students into the form prepared for collecting the data for the research.

Data Analysis

In the current research, the relationships amongst teaching-learning conceptions of teachers, academic achievement and test anxiety levels of students were calculated by conducting Pearson Product-Moment Correlation analysis, and hierarchical multiple regression analysis was used to identify the variables that predict test anxiety levels of students. Prior to the analyses, the hypotheses in accordance with hierarchical multiple regression analysis were tested in the research. As a result of the analysis, it was concluded that there was no values that hamper the linearity and normality assumptions in the data set, so that it was decided that the normality and linearity hypotheses were met. Also, the presence of autocorrelation between variables in the regression analysis was examined; Durbin-Watson value (D-W = 1.23) demonstrated that an autocorrelation did not exist between the variables. The data set was also examined in regard of the multicollinearity assumption and it was seen that there was not multicollinearity between the independent variables. Variance inflation factor (VIF) and conditions index (CI) were examined and VIF values were detected as 1.02-1.08, and CI values were found as 1.00-8.28 in the study. Values in regard to VIF equal to or higher than 10 and values in terms of CI equal to or higher than 30 demonstrate multicollinearity (see Büyüköztürk, Çokluk, & Köklü, 2011). In this regard, the findings obtained in the study demonstrated that there was not multicollinearity between the independent variables. These examinations showed that the data set was fit for multiple regression analysis, so that the related analyses were conducted in the study. To test the mediating role of test anxiety in the relationship between teaching-learning conceptions, Sobel-z test was adopted in the research.

Data Collection Procedure

The data of the current research was collected from teachers and students in public high schools. The information was collected by the researcher and this process lasted two months approximately The collection of the data for teaching-learning conceptions scale from teachers and the data for test anxiety scale from students lasted one month. Also, the collection of the

GPA in regard of the academic achievement levels of the students from the e-school system of the MoNE lasted for nearly one-month time. When the researcher was visiting the selected high schools, he firstly informed the teachers and students about the purpose of the study, and then explained how to fill the data collection tools to these participants. The completion of the scales took approximately 30 minutes for each scale used in the study. The voluntary participation of both teachers and students was taken seriously into account.

Findings

The relationships amongst teaching-learning conceptions adopted by teachers and the academic achievement and test anxiety levels of students were examined. Also, the mediating role of test anxiety for the relationship between teaching-learning conceptions and academic achievement was analysed in the study. To achieve these aims, first, descriptive statistics (mean, standard deviations, and relationships amongst the variables) was performed, to later continue with hierarchical multiple regression analysis. Table 1 presents the relationships amongst teaching-learning conceptions, academic achievement and test anxiety levels.

Table 1
Correlations matrix amongst teaching-learning conceptions, test anxiety, and academic achievement

	M	*SD*	1.	2.	3.	4.
1. TTLC	3.42	3.83	-			
2. CTLC	3.88	3.53	-.218**	-		
3. TA	3.47	7.69	.142	-.271**	-	
4. AC	54.65	11.62	.171*	.208**	-.283**	-

*p < .05, **p < .01

Note. TTLC = Traditional Teaching-Learning Conception; CTLC = Constructivist Teaching-Learning Conception; TA = Test Anxiety; AC = Academic Achievement.

According to the Pearson analysis conducted, it was seen that the traditional teaching-learning conception related negatively with the constructivist teaching-learning conception and academic achievement. However, it was concluded that traditional teaching-learning conception exhibited a positive, but not a significant relationship with test anxiety. On the other hand, it was seen that constructivist teaching learning conception exhibited a significant positive relationship with academic achievement, but exhibited a significant negative relationship with test anxiety. Also, it was found that test anxiety exhibited a negative relationship with academic achievement significantly.

At this point of the analysis, predictors of academic achievement levels of students were examined in three steps using hierarchical multiple regression analysis to consider the correlation coefficients between research variables. The findings indicated moderate level of significant relationships amongst the variables. Therefore, it was decided to examine the mediating role of test anxiety and the relationship between teaching-learning conceptions and academic achievement. Hence, the first step (model 1) evaluated traditional teaching-learning conception, the second step (model 2) evaluated traditional teaching-learning conception and constructivist teaching-learning conception, and the last step (model 3) evaluated traditional teaching-learning conception and constructivist teaching-learning conception and test anxiety on academic achievement.

Table 2

Hierarchical multiple regression analysis for the mediating role of test anxiety in the relationship between teaching-learning conceptions and academic achievement

Model	Dependent	Independent	β	t	R^2	F	p
1	AC	TTLC	.171	2.114	.029	4.467	.036*
2	AC	TTLC	.227	2.826	.093	7.511	.005*
		CTLC	.258	3.205			.002*
3	AC	TTLC	.251	3.210			.002*
		CTLC	.191	2.376	.158	9.139	.019*
		TA	-.267	-3.367			.001*

*$p < .01$

Note. TTLC = Traditional Teaching-Learning Conception; CTLC = Constructivist Teaching-Learning Conception; TA = Test Anxiety; AC = Academic Achievement.

In the first step of the analysis, it was seen that the traditional teaching-learning conception predicted academic achievement significantly, $\beta = .171$, $p < .01$, and explained 3% of the variance. In regard of the second step of the analysis, it was observed that the traditional teaching-learning conception predicted academic achievement significantly, $\beta = .227$, $p < .01$, as well as the constructivist teaching-learning conception predicted academic achievement significantly, $\beta = .258$, $p < .01$. In the analysis, it was seen that traditional and constructivist teaching-learning conceptions together explained 9% of the variance. Lastly, in the third step, test anxiety emerged as a mediating variable that significantly predicted academic achievement, $\beta = -.267$, $p < .01$, and explained approximately 16% of the variance together with traditional and constructivist teaching-learning conceptions in the research. In the third step, it was concluded that taken together with the mediating variable (test anxiety), there was an increase in the strength of the relationship between teaching-learning conceptions and academic achievement. Therefore, it can be claimed that test anxiety mediated the relationship between teaching-learning conceptions and academic achievement significantly, Sobel-$z = 2.149$, $p < .01$.

Discussion

The purpose of this research was to examine the mediating role of test anxiety on the relationship between teaching-learning conceptions and academic achievement. Up to now, the study of teaching-learning conceptions and academic achievement has taken place in relative isolation; researchers have mostly focused on academic achievement levels of students by analysing their socio-economic status, parental factors, study skills, learning strategies, etc., whereas the impact of teaching-learning conceptions adopted by teachers on academic achievement levels of students has received less attention in the literature (Donche, De Maeyer, & Van Petegem, 2007; Gow & Kember, 1993). Most relevant to the current study, there is a lack of research examining the relationship between teaching-learning conceptions and academic achievement. Thus, the research reported in this article extends the literature by examining the relationship between

teachers' teaching-learning conceptions and students' academic achievement levels, and the mediating role of test anxiety in the relationship between teaching-learning conceptions and academic achievement.

According to the first finding obtained in the research, positive significant relationships between teaching-learning conceptions and academic achievement, defined as independent and dependent variables respectively were determined (see Table 1). According to this finding, it was concluded that there was a significant positive relationship between teachers' traditional and constructivist teaching-learning conceptions and students' academic achievement levels. Also, while it was seen that both traditional and constructivist teaching-learning conceptions were a significant predictor of academic achievement, the constructivist conception was understood to be a more significant predictor of academic achievement, compared to the traditional conception. Previous research literature reports that there are significant positive relationships between teaching-learning conceptions adopted by teachers and academic achievement level of students (e.g., Donche, De Maeyer, & Van Petegem, 2007; Gow & Kember, 1993).

Although there is little research regarding the issue explored in our study; such research had concluded that students in classrooms where teachers adopt a constructivist teaching-learning approach had a higher level of academic achievement than students in classrooms where teachers adopt traditional teaching-learning conceptions (e.g., Gow & Kember, 1993). At the same time, despite different results were acquired in studies which examined the instruction based on constructivist and traditional approaches on academic achievement levels of students by using experimental research methods (e.g., Akyol, 2011; Ilyas, Rawat, Bhatti, & Malik, 2013; Koç, 2002; Latchman, 2000; Serin, Serin, & Saygılı, 2008), the instruction based on constructivism is advocated that it is a more effective approach in raising academic achievement levels of students than traditional ones (e.g., Akyol, 2006; Baş, 2015b; Becker & Mousiniyet, 2004; Christanson & Fisher, 1999; Koç, 2002; Latchman, 2000; Polak, 2008).

Today, there is a trend in instruction to move from traditional to constructivist approaches (Travis & Lord, 2004; Grant, 1997). The debate over which one is more effective in raising academic achievement levels of students maintains its topicality (Khalid & Azeem, 2012). Despite the debate

over which approach is more effective in raising academic achievement levels of students maintains its topicality; the trend towards the use of constructivism in instruction is increasing steadily (Fer & Cırık, 2007; Shymansky, 1992). Although the number of research testing the effect of instruction based on traditional and constructivist approaches on academic achievement levels of students by using experimental research methodology is quite more, there is not much research reporting the impact of teaching-learning conceptions adopted by teachers on academic achievement levels of students in the literature (Donche, De Maeyer, & Van Petegem, 2007; Gow & Kember, 1993). Hence, the current research is evaluated as to be an important step in resolving the lack regarding this issue. The limited number of research on this issue increases the need for future research on the related subject.

In addition, it was concluded in the research conducted that there was a significant relationship between teaching-learning conceptions adopted by teachers and test anxiety levels of students. According to this finding, it was seen that there was a significant negative relationship between constructivist teaching-learning conception and test anxiety, and a positive but not a significant relationship was found between traditional teaching-learning conception and test anxiety. The research literature provides supporting results for this finding obtained in the current study (e.g., Alsup, 2004; Baş, 2015b). Thus, in the literature on this topic was observed that students in classrooms where teachers adopted constructivist teaching-learning conceptions had lower levels of test anxiety. However, students in classrooms where teachers adopted traditional teaching-learning conception students showed higher level of test anxiety (e.g., Alsup, 2004; Kelley, 1999; Kim, 2005). So, our finding in this regard can be explained by considering teaching-learning conceptions adopted by teachers in the classroom. In this sense, while it can be said that students in constructivist classrooms are being educated in anxiety free, autonomous, self-directed, and cooperative learning environments (Semerci, 2001), it can also be stated that students in traditional classrooms are being educated in environments where coercion, strict study, and punishment highly exist (Hoy & Weinstein, 2006). Besides, while students in constructivist classrooms are evaluated in the learning process by using multiple ways such as projects, presentations,

worksheets, structured assessment grids, concept maps, portfolios, etc., and the scores of these students are only used for determining the strengths and weaknesses of them, instead of making students proceed to upper grades (Brooks & Brooks, 1999; Gagnon & Collay, 2001; Herman, 1992), students in traditional classrooms are evaluated by adopting formal examinations, multiple choice tests, verbal examinations, etc., and the scores of these students carry weight with making them proceed to upper grades at school (Anderson, 1998; Black & William, 1998). Hence, it is expected that test anxiety of students in classrooms where teachers adopt constructivist teaching-learning conception stay in low level, whereas test anxiety of students in classrooms where teachers adopt a traditional instructional approach is expected to be higher. In this regard, our findings are consistent with related results in current research literature (e.g., Alsup, 2004; Baş, 2015b; Kelley, 1999; Kim, 2005).

Also, it was found that there was a significant negative relationship between test anxiety and academic achievement levels of students. This finding shows consistency with other results published in current relevant literature (e.g., Chapell et al., 2005; Culler & Holahan, 1980; Fincham, Hokoda, & Sanders, 1989; Seipp, 1991). Other studies have found that learning and academic achievement decrease as a result of high anxiety, and increase as a result of reinforcement and anxiety free learning atmospheres (Hembree, 1988; Rana & Mahmood, 2010). So, students with a higher level of test anxiety are expected to have low levels of academic achievement; also, students with a lower level of test anxiety are expected to have higher levels of academic achievement at school (e.g., Carden, Bryant, & Moss, 2004; Hancock, 2001). In the current research, it was revealed that there was a significant negative relationship between test anxiety and academic achievement levels of students, so this finding implies that test anxiety levels of students decrease as their academic achievement levels increase or test anxiety levels of students increase as their academic achievement levels decrease. This results adds to the existing research literature in proving the negative relationship between test anxiety and academic achievement levels of students at school.

Additionally, it was found that test anxiety emerged as having a mediating role in the relationship between teaching-learning conceptions and

academic achievement. In the research reported here, it was concluded that test anxiety significantly mediated the relationship between the teaching-learning conceptions adopted by teachers and the academic achievement levels of students. In the analysis, it was seen that the traditional teaching-learning conception predicted academic achievement significantly and explained 3% of the variance. In this regard, it was observed that the traditional teaching-learning conception as well as the constructivist teaching-learning conception predicted academic achievement significantly. Also, it was seen that traditional and constructivist teaching-learning conceptions together explained 9% of the variance. Besides, test anxiety emerged as a mediating variable that significantly predicted academic achievement and explained approximately 16% of the variance together with traditional and constructivist teaching-learning conceptions in the research (see Table 2). Thus, we could conclude that test anxiety mediated the relationship between teaching-learning conceptions and academic achievement significantly. This finding is especially relevant, as it indicates that teaching-learning conceptions, which have been mostly neglected in the relevant literature, are an important factor in shaping academic achievement of students. Up to now, while research has identified that teacher classroom behaviours have direct or indirect effects on academic achievement levels of students (e.g., Brophy, 1986; Cobb, 1972; Fisher, 1981), the research regarding the impact of teaching-learning conceptions adopted by teachers on academic achievement levels of students has been poor in the literature. Out finding provides evidence on what the literature has suggested; that the conceptions adopted by teachers in terms of teaching and learning affect how students learn (Gow & Kember, 1993), as students are educated in accordance to the conceptions adopted by their teachers (Chan & Elliott, 2004). Regarding the mediating role of test anxiety, such instructional conceptions of teachers are reflected on the academic achievement levels of students at school.

In other words, it has been demonstrated that how teachers think about learning and teaching is associated with how their students learn (Donche, De Maeyer, & Van Petegem, 2007). While teachers' teaching-learning conceptions and test anxiety are important factors for students' academic achievement levels, there may be additional factors shaping academic

achievement that should be taken into account, such as the educational philosophy of teachers (e.g., Gutek, 1988), classroom management styles (e.g., Evertson et. al., 1984), and student control ideologies (e.g., Willower, Eidell, & Hoy, 1973). There is a large body of literature indicating that student control ideologies (e.g., Baş & Beyhan, 2013) and teachers' beliefs on philosophy of education (e.g., Baş, 2015a) are closely related with the teaching-learning conceptions adopted by teachers. Therefore, it may be claimed that these factors may be effective in explaining academic achievement levels of students in the classroom.

Implications for Practice

The findings obtained in the current research have important educational implications for teachers and teacher educators. On the one hand, the results suggest that teaching-learning conceptions were a significant predictor of academic achievement. The findings indicated that both traditional and constructivist teaching-learning approaches had significant impacts on student academic achievement. It appears that both traditional and constructivist conceptions may be beneficial to students by promoting higher level of academic achievement, however, constructivist conception emerged as a more significant predictor of academic achievement, compared to the traditional one, without taking test anxiety into account (see Table 2). Hence, the finding suggested that students in classrooms where teachers adopted constructivist teaching-learning approaches were more successful than the students in classrooms where teachers adopted the traditional one. Thus, implementing constructivist methods in classroom instructional practices proves being beneficial. However, despite the constructivist teaching-learning conception was a more significant predictor of academic achievement compared to the traditional one, it must also be noted that the traditional teaching-learning conception was a significant predictor of academic achievement. So, this result indicated that both conceptions adopted by teachers were effective in raising academic achievement levels of students. Thus, although most experimental studies show that constructivist approach is more effective in raising students' academic achievement levels than the traditional approach, there are contrasting results in regard of the

positive effect of both constructivist and traditional approaches on the academic achievement levels of students. Therefore, more research is needed on this very issue.

On the other hand, the findings of the research indicated that test anxiety had a mediating role in the relationship between teaching-learning conceptions and academic achievement. This finding suggested that test anxiety was an important mediating factor in explaining the predictive value of teaching-learning conceptions on academic achievement. Without test anxiety, teaching-learning conceptions predicted 9% of the variance of academic achievement; however, teaching-learning conceptions predicted approximately 16% of the variance of academic achievement when taking test anxiety as a mediating variable into account. Therefore, test anxiety may be claimed to be an important factor in the explanation of academic achievement of students by teaching-learning conceptions adopted by their teachers. Also, it was seen in the research that there was a significant negative relationship between constructivist teaching-learning conception and test anxiety, yet a positive but not a significant relationship between traditional teaching-learning conception and test anxiety was observed. This finding suggests that students in classrooms where teachers adopted a constructivist conception of learning had a negative level of test anxiety, whereas students in classrooms where teachers adopted the traditional one had a positive level of test anxiety. Hence, this finding informs that students have lower level of test anxiety in constructivist classrooms, so that measurement and evaluation methods out of formal tests and examinations are very important, resulting in low level of test anxiety in students (Crooks, 1988). Therefore, it may be suggested that students should be educated in classrooms where teachers adopt constructivist teaching-learning conception (e.g., Alsup, 2004; Baş, 2015b). As a whole, the current research leads to the conclusion that teachers would do well to provide students with a constructivist classroom, as opposed to the traditional one, and that they should seek opportunities to implement a constructivist atmosphere in the classroom.

Implications for Research

In this research, teaching-learning conceptions adopted by teachers were seen to be effective in explaining academic achievement levels of students, with the mediating role of test anxiety. However, while these conceptions adopted by teachers are not the sole factors in explaining students' academic achievement levels, future research should be carried out to account for those other factors. Also, in future research additional mediating factors such as locus of control, student control ideology, etc. should be taken into account to examine academic achievement levels of students. Furthermore, experimental studies should be conducted to determine what other variables in addition to teaching-learning conceptions, such as student control ideology and beliefs of educational philosophy, impact students' levels of academic achievement. Besides, other research, similar to the one reported here, should be conducted to support with qualitative data the questions addressed in our study. This would help to better understand the impact of teaching-learning conceptions adopted by teachers on academic achievement as well as the overall role of teaching-learning conceptions in shaping the academic achievement levels of students.

Limitations

Limitations of the current research included the fact that a rather small number of participants (both teachers and students) were included in the study. Also, the research was carried out in a rather small province of Turkey, thus the results of this research should be completed with data from participants from larger provinces and samples. Besides, the current research included a small number of variables (teaching-learning conceptions and test anxiety) to determine the academic achievement levels of students. Future research may be conducted to evaluate the impact of teaching-learning conceptions by considering additional factors that are thought to be effective on academic achievement.

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