

Full Length Research Paper

The relationships between self-regulated learning skills, causal attributions and academic success of trainee teachers preparing to teach gifted students

Marilena Z. Leana-Taşçılar

Department of Special Education, Hasan Ali Yucel Faculty of Education, Gifted Teacher Training Program, Istanbul University, B Blok, Fatih, Istanbul, Turkey.

Received 13 April, 2016; Accepted 15 June, 2016

The purpose of this research is to examine the self-regulated learning skills and causal attributions of trainee teachers preparing to teach gifted pupils, and also to study the predictive relationships between these skills and attributions, on one hand, and academic success, on the other hand. The research was conducted on 123 students attending the Gifted Teacher Training Program at Istanbul University, the first program of its kind to be initiated in Turkey. The instruments used for data collection were the Self-Regulated Learning Skills Scale (SRLSS), Causal Dimensions Scale II, and Great Point Average (GPA). According to the results obtained, girls scored higher in self-regulated learning skills such as planning and strategy using / assessment; they also scored higher in total self-regulated learning skills. Results for the lack of self-directedness sub-dimension showed statistically meaningful differences, with third-year students scoring highest, while there were also statistically meaningful differences in the locus of causality given as the reason for lack of success, with first-year students scoring highest. Correlation analysis showed a positive relationship between self-regulated learning skills and the causal focus subscale of causal attributions; between stability and personal control; and between scores for the planning, strategy using / assessment, and total self-regulated learning skills subscales of self-regulated learning skills on the one hand, and academic success on the other hand. However, it appeared that only the planning sub-dimension was a predictor of academic success. Finally, in the current study the subject of why the possession of these skills is important for trainee teachers preparing to teach gifted and talented students is discussed.

Key words: Self-regulated learning, causal attribution, academic success, teachers of gifted children.

INTRODUCTION

The characteristic of persons who are already teaching or who are preparing to teach gifted and talented children is a subject of debate. The studies conducted by Robinson

(2008) show that research into the characteristics of teachers of gifted and talented children focuses mainly on these teachers' demographic profile, their skills, their

*Corresponding author. E-mail: mleana@istanbul.edu.tr. Tel: +90 212 440 00 00 -13043.

personal characteristics and their degree of competence. The investigations carried out by Feldhusen (1997), which focused on the personal characteristics of and degree of competence exhibited by such teachers, concluded that these persons should possess similar characteristics with the gifted and talented children. He also determined that these characteristics are of a kind which enhances the quality of any teacher or leader. On detailed examination of these characteristics, which are collated from the findings of various pieces of research and from a number of different sources, we notice that in features such as 'is well-organized, systematic', 'teaches students to evaluate themselves', 'is in control of her/his own life', 'provides guidance', 'encourages individual learning', 'is optimistic' and 'is effort-oriented rather than grade-oriented' (Feldhusen, 1997) are in fact parallel with self-regulated skills and causal attributions.

Stoeger and Sontag (2012), who carried out research on the ways in which gifted and talented students learn emphasize that current findings strongly indicate self-regulated learning. In addition, Wendel and Heiser (1989), in describing the characteristics of teachers of gifted and talented students, stated that such teachers should 'encourage independent study'. Accordingly, they maintain that teachers, coaches or mentors of gifted and talented children should plan, exercise self-monitoring, set goals for themselves and carry out self-evaluation. It is a well-known fact that if a teacher sees the reason not only for her/his own successes and failures, but also those of her/his students, as external, and thus as not being personally controlled or predictable, this will never have a positive effect on the learning process. In this regard, it is of great importance that both the degree to which individuals who are to teach gifted and talented students possess self-regulated learning skills, and the nature of these persons' causal attributions, should be determined; it is also important to ensure that trainee teachers of this kind are aware of these issues.

What is self-regulated learning?

From the socio-psychological perspective, self-regulated learning is part of the general theory of social cognition (Boekaerts et al., 2000). Zimmerman (2000) maintains that the individual's self-perception affects her/his self-regulated learning skills, and that these skills are unavoidably affected by the social and physical environment. Self-regulated learning has been related particularly to learning processes such as motivation and academic success, and is a subject that has attracted the interest of a number of researchers (Pintrich and De Groot, 1990).

Self-regulated learning is for the most part a process in which the student is an active participant. As stated by Schunk (1996), in order for an individual to bring about learning, s/he needs to set goals, determine how to reach

those goals, carry out these strategies and evaluate the learning outcome. Students can be said to possess self-regulated learning skills when they play an active role; from the cognitive, motivational and behavioral points of view in their own experiences of learning (Zimmerman, 1986). Stoeger (2013) stated that students are able to develop their own self-regulated learning processes from the age of nine. This is quite a young age, and the necessary measures need to be taken in learning environments so that the infrastructure for this development can be laid down. It is only in this way that the positive effects of self-regulated learning can be more effectively manifested in learning processes in maturity.

Those experts who have proposed models for self-regulated learning generally claim that it has a cyclical structure (Ziegler et al., 2012; Zimmerman, 1998). According to Zimmerman (2000), this cycle consists of the following processes: Forethought, performance, and self-reflection. The forethought phase contains task analysis (goal-setting and strategic planning) and self-motivating beliefs (self-efficacy, outcome expectations, and goal orientation). The performance phase is made up of the processes of self-control (self-instruction, focusing attention, and strategies) and self-observation. Lastly, the self-reflection phase is made up of the following processes: Self-judgment (self-evaluation, causal attributions) and self-reaction (e.g., satisfaction, adaptive/defensive attitudes) (Zimmerman, 2000). Ziegler et al. (2012) speak of a cyclical structure consisting of seven steps. It is expected that in the first step, the individual will evaluate her/his own learning; in the second, s/he will set a learning goal appropriate to her/himself; in the third, s/he will identify an effective learning strategy; in the fourth, s/he will put this learning strategy into practice; in the fifth, s/he will carry out self-observation; in the sixth, s/he will adjust her/his learning strategies; and in the seventh, s/he will evaluate her/his learning outcomes.

Several studies have examined the relationship between self-regulated learning and success. In a longitudinal study conducted on lycée students, Nota et al. (2005) found that the possession by students of self-regulated learning skills affected their degree of success, and even that it predicted their average grades. The results of other studies show that educational programs designed to develop self-regulated learning skills have an effect on success (Perels et al., 2009). Researches conducted on university students find that successful students use self-regulated learning skills to a greater extent than the less successful do.

What is the theory of attribution?

The 'Theory of Attribution', put forward in order to facilitate a better understanding of individuals' behavior, has long been seen as lying within the field of research of psychologists and those concerned with management

Table 1. Classification of attribution theory according to the causal dimensions

Attribution	Ability	Effort	Difficulty	Luck
Interior	xx	xx		
Exterior			xx	xx
Stable	xx		xx	
Inconsistent		xx		xx
Controllable		xx		
Not controllable	xx		xx	xx

Blefare (1994).

(Bettman and Wieitz, 1983; Weiner, 1985). The actions of individuals are shaped by their interpretation of the successes and failures that result from previous experiences, and this affects their motivation. The process of understanding the reasons for the individual's own behaviors, or those of others, is defined as 'causal attribution'. The theory of 'attribution' focuses (firstly) on the reasons why a particular event, situation or result occurs, and (secondly) on explaining the consequences of this causality (Weiner, 2000a). According to Weiner (2000b), it is especially when the individual encounters an unexpected negative result that s/he devotes thought to the reason, whereas an expected positive result does not give rise to such prolonged reflection.

The question of success and failure is studied from three aspects: Focus, stability and control (Weiner, 2000a). The focus aspect is concerned with the source (interior or exterior) of the cause; the stability aspect with its continuity; and the control aspect with the question of whether or not control over the situation can be achieved (Stipek, 1988). Weiner (2000b) groups the perceptual factors affecting the individual's performance under four headings: perceived ability, effort, luck, and the difficulty of the task involved. Causes such as ability and effort are 'interior'; causes such as the circumstance of someone having provided help are 'exterior'. Ability is stable in that it is permanent; luck is inconsistent, and therefore cannot be a source of 'stability'. Effort is a cause over which the individual may have control; ability, however, is generally perceived as being beyond control from the individual's point of view (Table 1). In some situations, there is a conflict of attributions since different reasons for success or failure are put forward by different people. As an example of this, students may attribute their lack of success in an examination to the difficult questions asked by the teacher (an exterior cause), while the teacher may attribute the students' lack of success to the insufficiency of the effort put forward by them (Koçyiğit, 2011).

As stated by Kızgın and Dalgın (2012), the process of attribution enables one to search for and understand the reasons for an event, to ascertain who exactly the people responsible for it are, and to comment (according to the attributions made) on the personal characteristics of the individuals concerned. Persons who attribute reasons for

events to internal factors, and who thus give importance to effort in the knowledge that it is through effort that continuity and control can be achieved, are able to make more reliable assessments of their successes and failures.

Causal attribution is a subject which has only recently been included in studies of success and failure in the field of education (Buchanan and Seligman, 1995). However, different researches into the relationship between various kinds of attribution and academic success have yielded conflicting findings. Some pieces of research have found that students with negative causalities have lower grade averages than students with positive causalities (Peterson and Barret, 1987; Schulman, 1995); other studies have shown that those with negative causalities have higher grade averages (Satterfield et al., 1997). Research carried out by Kızgın and Dalgın (2012) has found that the reason most often given by students for their failures is the 'difficulty of the task' factor, while the reason least often given is 'ability'; their successes are most often attributed to 'effort', and least often to the 'difficulty of the task' factor.

Self-regulation and attribution

As stated above, according to Zimmerman (2000), one of the phases of self-regulation is that of self-reflection. In this phase, which begins with self-evaluation, the individual compares her/himself with others, and wishes to obtain rapid and accurate feedback on her/his performance. Self-evaluation leads the individual to reflect on the subject of to what s/he is to attribute her/his successes or failures (Nokelainen et al., 2007). Causal attributions may give rise to positive or negative behaviors. If the individual attributes her/his failure to paucity of effort, this will result in the manifestation of positive behaviors next time as s/he will now put forth greater effort; if, on the other hand, this failure is attributed to bad luck or lack of ability, the result will be negative behaviors as s/he will not put forth effort next time.

Causal attributions do not only permit one to learn from one's mistakes during the learning process; they also

bring about a reorganization of the learning process and, if necessary, the making of adjustments to it. This is where the sixth step of the self-regulated learning process as put forward by Ziegler et al. (2012), that is, the skill of making adjustments to learning strategies, comes into play. The individual will only be able to make the proper adjustments to her/his strategies or behaviors if s/he can first make accurate causal attributions. According to Nokelainen et al. (2007), because the self-reflection phase affects the self-evaluation, goal-setting and self-efficacy processes, it occupies an important place in the process of self-regulation. For this reason, it is important to research its relation to causal attributions (which are a part of self-reflection). Accordingly, the purpose of the current study is to ascertain the self-regulated learning skills and causal attributions of trainee teachers preparing to teach gifted and talented pupils, and to identify the relationship between self-regulated learning skills, causal attributions and academic success.

METHODS

The design of this study

In this study, the correlational comparative survey method was used. Correlational comparative models are research models designed to ascertain whether or not two or more variables change together, and if so to what extent (Karasar, 1994). As stated by Karasar (2009), although they possess certain limitations they have a wide application, and are seen as the best alternative when experimental models are not used.

Population and sample

In determining the sampling method of the study, the intentional sampling method known as the 'easy access sampling method' (Yıldırım and Şimşek, 2008) was chosen for the advantages it provides from the point of view of purpose sampling and ease of access. The sample for the study was made up of 123 trainee teachers (32 men, representing 26%, and 91 women, representing 74%) attending the Gifted Teacher Training Program, the first program of its kind to be initiated in Turkey. Of these 123 trainee teachers, 28 (that is, 22.8%) were first-year students, 34 (that is, 27.6%) were second-year students, 38 (that is, 30.9%) were in their third year, while 23 (that is, 18.7%) were in their fourth year.

These trainee teachers were students in faculty of education in University of Istanbul, Turkey. They entered to this program as all other university students in Turkey by giving exams and select a program according to their points. All of the trainee teachers of the sample were attending the Gifted Teacher Training Program, that has a fixed educational program for all teacher candidates. The difference of the program from Primary Teacher Training Program is that it includes lectures about giftedness and the education of gifted students such as: Introduction to Gifted Education, Creativity, Teaching the Gifted Students in Regular Classrooms etc. However, none of the trainee teachers were tested according to their intelligence. Whether they were gifted or not they intend to teach gifted students when they will graduate.

Evaluation instruments

The Self-Regulated Learning Skills Scale (SRLSS): The SRLSS

was developed by Turan and Demirel (2010) in order to measure the self-regulated learning skills of university students. It consists of 41 items in four dimensions. 7 of the items are related to motivation/action to learn; 8 are related to planning/goal-setting; 19 relate to strategy using/assessment; and 7 to lack of self-directedness in learning. As stated by Turan and Demirel (2010), these dimensions include the stages that are defined by Zimmerman (1998) as 'theoretical' for self-regulated learning, and also include motivation.

All items on the SRLSS were answered on a 5-point Likert-type scale: from (1) 'I completely disagree' to (5) 'I completely agree'. The scale has a KMO coefficient of 0.95, and a Barlett test significance of $p < 0.01$. For the lower dimensions, the Cronbach alpha coefficients are 0.79, 0.86, 0.89 and 0.78 respectively; for all items, the alpha is 0.92 (Turan, 2009). According to current study findings, the Cronbach alpha coefficients for the lower dimensions are 0.77, 0.89, 0.90 and 0.67 respectively; for all items, the Cronbach alpha is 0.86.

The Causal Dimensions Scale II: This scale was developed by McAuley, Duncan, and Russell (1992) in order to evaluate causal attributions in students' explanations for their successes and failures, and was translated into Turkish by Koçyiğit (2011). The scale evaluates causal attributions in 4 dimensions (locus of causality, external control, stability, and personal control), and consists of 12 items. In each item, there are two contradictory statements, and the participant is asked to evaluate whichever of these two statements s/he feels closer to, scoring the degree of closeness on a scale from 1 to 9. A high score obtained from the subscales shows that the cause is internal, stable and personally controllable. The scale's KMO coefficient is 0.82, and the Barlett test result has a significance level of $p < 0.01$; for the subscales, the Cronbach alpha coefficients for success attributions are 0.66, 0.75, 0.77 and 0.56 respectively, while findings for failure attributions are 0.71, 0.74, 0.77 and 0.65 respectively. In the findings of the current study, success attributions are calculated at 0.73, 0.52, 0.50 and 0.79 respectively; failure attributions are calculated at 0.80, 0.76, 0.68 and 0.64 respectively.

Academic success: Data relating to students' degree of academic success were obtained from faculty records. Degree of academic success, expressed in terms of Great Point Average (GPA), is expressed by means of the end-of-term weighted grade averages achieved by students in the subjects they took in the spring term during the 2014 to 2015 academic year. At Hasan Ali Yücel Faculty of Education, where the students were registered, a relative evaluation system is used in the process of evaluation, which forms the basis of the measuring of academic success.

The process of data collection

Data collection instruments were applied during the spring term of the 2014 to 2015 academic year. Before the scales were applied, some brief information was given to students on the aim of the study. The two scales were administered consecutively, and each one took an average of 30 min. In addition, in order to ascertain students' degree of academic success, access to the relevant faculty's records was gained, and students' GPA scores were obtained.

Data analysis

The SPSS package program was used in analyzing the data. The test of normality results showed that parametric statistical techniques can be used, so t-test used to analyse the gender differences, ANOVA to analyse the grade differences and Pearson

Table 2. Means, standard deviations and t-test scores of self-regulated skills according to gender.

Subscales	Gender	n	x	SD	Df	t	p
Motivation and action to learning	Female	91	28.62	3.34	121	-1.24	0.214
	Male	32	27.75	3.59			
Planning	Female	91	32.05	4.87	121	-3.33	0.001***
	Male	32	28.53	5.83			
Strategy using and assessment	Female	91	74.74	8.72	121	-2.67	0.009**
	Male	32	69.96	8.64			
Lack of self-directedness	Female	91	17.37	4.26	121	1.75	0.082
	Male	32	18.96	4.86			
Total self-regulated skills	Female	91	152.80	13.34	121	-2.74	0.007**
	Male	32	145.21	13.80			

Table 3. Means, standard deviations and ANOVA results of self-regulated skills according to grade.

Skill	1 st Grade (n=28)	2 nd Grade (n=34)	3 rd Grade (n=38)	4 th Grade (n=23)	F	p
Motivation and action to learning	28.25 (3.38)	28.5 (3.15)	28.39 (3.44)	28.43 (3.98)	0.028	0.994
Planning	31.75 (4.23)	30.23 (6.67)	30.84 (4.46)	32.21 (5.74)	0.793	0.500
Strategy using and assessment	74.46 (7.53)	72.94 (11.7)	73.13 (6.58)	73.78 (9.55)	0.179	0.910
Lack of self-directedness	16.35 (3.27)	17.85 (5.60)	19.78 (3.24)	16.13 (4.47)	50.01	0.003**
Total self-regulated skills	150.82 (11.79)	149.52 (17.34)	152.15 (10.69)	150.56 (15.43)	0.216	0.885

**p< .01.

Correlation to analyse the correlations among self-regulated skills, attributions and academic achievement.

FINDINGS

In the results of the Kolmogorov-Smirnov test carried out to test normality for self-regulated learning skills, the level of significance was found to be 0.200 (KS=0.054, df=123). Therefore, parametric statistical techniques were used in the analysis of the data.

Self-regulated learning skills of trainee teachers of gifted and talented children

The self-regulated learning skills of trainee teachers on the Gifted Teacher Training Program were examined based on sex and class-year variables.

Results on the question of whether or not the self-regulated learning skills of trainee teachers showed variation according to sex are shown in Table 2. As will be seen from this table, meaningful differences were found in the scores for the self-regulated learning skills of planning/goal-setting ($p<.001$), strategy using/evaluation ($p<.01$), and total self-regulated learning skills ($p<.01$),

with girls scoring higher. In other sub-skills, no differences were found with regard to sex.

Results in terms of whether or not trainee teachers' self-regulated learning skills showed variation according to the class year they were in are shown in Table 3. Significant differences between class years in terms of self-regulated learning skills were observed only in the lower dimension of lack of self-directedness ($p<.01$). Post Hoc (Bonferroni) analysis revealed meaningful differences between third-year students on one hand, and first and fourth year students on the other, with third-year students scoring higher ($p<.01$ for each class year).

Causal attributions of trainee teachers of gifted and talented children

Examination of all mean scores showed that in the matter of trainee teachers' causal attributions relating to success, figures for the belief that it was personally controllable were $x=22.40$, $ss=4.46$, those for the belief that the locus of causality was internal were $x=22.13$; $ss=4.82$, those for the belief that stability was permanent were $x=18.73$; $ss=4.80$, and those for belief in the relative external controllability of success were $x=12.43$; $ss=5.50$. As for failure, it was found that the belief that this was

Table 4. Means, standard deviations and t-test scores of attributions relating to success and failure according to gender.

Attribution	Subscale	Gender	n	x	SD	Df	t	p
Attributions relating to success	Locus of causality	Female	91	22.13	4.61	120	0.029	0.977
		Male	31	22.16	5.47			
	External Control	Female	91	12.37	5.53	120	0.208	0.835
		Male	31	12.61	5.49			
	Stability	Female	91	18.65	4.98	120	0.307	0.759
		Male	31	18.96	4.30			
Personally controllable	Female	91	22.31	4.28	120	0.350	0.727	
	Male	31	22.64	4.76				
Attributions relating to failure	Locus of causality	Female	91	12.16	6.73	120	1.52	0.131
		Male	31	14.38	7.77			
	External Control	Female	91	17.72	6.10	120	-0.680	0.498
		Male	31	16.83	6.63			
	Stability	Female	91	13.52	6.19	120	-0.773	0.441
		Male	31	12.51	6.40			
	Personally controllable	Female	91	13.32	6.95	120	0.242	0.809
		Male	31	13.67	7.30			

subject to external control registered was $x=17.49$; $ss=6.22$; the belief that it was relatively personally controllable was $x=13.41$, $ss=7.01$; the belief that it was more impermanent was $x=13.26$, $ss=6.24$, and the belief that the locus of causality was external factors was $x=12.73$, $ss=7.05$.

In addition, trainee teachers' causal attributions for success and failure were examined based on sex and class-year variables. As shown in Table 4, causal attributions for success or failure showed no significant differences from the sex variable.

When trainee teachers' causal attributions for success and failure were analyzed based on the class-year variable, a significant difference was observed only in the 'locus of causality' lower dimension in respect of causal attributions for failure. Advanced Post Hoc Bonferroni analysis revealed significant differences between the first and second years ($p < .05$), between the first and third years ($p < 0.01$) and between the first and fourth years ($p < 0.05$), with first-year students scoring highest (Table 5).

Relationships between the self-regulated learning skills, causal attributions and degrees of academic success exhibited by trainee teachers of gifted and talented children

Table 6 shows the relationship between causal attributions relating to success and self-regulated learning skills on one hand, and academic success on the other; Table 7 shows the relationship between causal attributions relating to failure, on one hand, and self-regulated learning and academic success, on the other hand.

As can be understood from Table 6, a positive correlation was observed between self-regulated learning skills (planning/goal-setting, strategy using/evaluation, and scores for total self-regulated learning) and degree of academic success. No relationship was observed between the subscales of causal attribution relating to success and degree of academic success. However, a positive correlation was observed between the locus of causality subscale and the following: Motivation/action to learn; planning/goal-setting; strategy using/evaluation; and total self-regulated learning skills. Positive correlations were found between the 'stability' lower dimension of causal attributions relating to success and the lower dimensions of self-regulated skills, with the exception of lack of self-directedness (negative correlation). Also, significant positive correlations were found between personal control and motivation, and between strategy using/assessment and scores for total self-regulated learning skills.

When the relationship between self-regulated learning skills, causal attributions relating to failure and degree of academic success are examined (Table 7), it is seen that the correlations between the lower dimensions of causal attribution and self-regulated learning disappear. Just as in the case of causal attributions relating to success, no relationship was found between attributions relating to failure and degree of academic success.

Regression analysis

In order to determine to what extent the causal attributions relating to success of trainee teachers of gifted and talented children predict their self-regulated learning skills (Table 8), and to what extent their self-regulated learning

Table 5. Means, standard deviations and ANOVA results of attributions relating to success and failure according to grade.

Attribution	Subscale	1st Grade (n=28)	2nd Grade (n=34)	3rd Grade (n=38)	4th Grade (n=23)	F	p
Attributions Relating to Success	Locus of causality	23.75 (3.27)	21.24 (4.98)	21.47 (5.23)	22.56 (5.20)	1.75	0.160
	External Control	11.21 (4.80)	13.42 (6.91)	12.76 (5.42)	11.95 (3.93)	.916	0.436
	Stability	19.71 (4.66)	18.45 (5.22)	18.23 (3.91)	18.73 (4.80)	.555	0.646
	Personally controllable	23.64 (3.62)	22 (3.97)	21.76 (4.93)	22.52 (5.15)	1.07	0.362
Attributions Relating to Failure	Locus of causality	16.78 (7.43)	11.90 (5.98)	11.36 (6.34)	11.21 (7.60)	4.40	0.006**
	External Control	15.67 (7.22)	18 (5.78)	17.73 (6)	18.6 (5.8)	1.13	0.339
	Stability	12.10 (6.41)	14.06 (6.53)	13.23 (6.39)	13.60 (6.24)	0.513	0.674
	Personally controllable	14.60 (7.78)	13.59 (6.73)	13.34 (7.13)	11.82 (6.34)	0.665	0.575

Table 6. Correlations for the self-regulated skills, attributions relating to success and academic achievement.

S/N	Self-regulated skills	2	3	4	5	6	7	8	9	10
1	Motivation and action to learning	0.480**	0.591**	-0.297**	0.719**	0.250**	0.004	0.255**	0.251**	0.147
2	Planning		0.660**	-0.454**	0.786**	0.196*	-0.085	0.252**	0.166	0.379**
3	Strategy using and assessment			-0.437**	0.906**	0.309**	-0.141	0.263**	0.293**	0.243*
4	Lack of self-directedness				-0.208*	-0.129	0.171	-0.200*	-0.154	-0.169
5	Total self-regulated skills					0.296**	-0.068	0.266**	0.266**	0.277**
6	Locus of causality						-0.472**	0.424**	0.773**	0.037
7	External control							-0.079	-0.452**	-0.020
8	Stability								0.383**	-0.039
9	Personally controllable									0.053
10	Academic achievement									

*p< 0.05; **p< 0.01.

skills predict their degree of academic success (Table 9), regression analyses were carried out. As no correlation was found between causal attributions relating to failure and self-regulated learning skills on the one hand, and degree of academic success on the other, this analysis was not performed.

Similarly, causal attributions were not included in the analyses predicting degree of academic success because no correlation was found between causal attributions and degree of academic success.

As shown in Table 8, according to regression analyses carried out in order to determine to what

extent causal attributions predict self-regulated learning skills, stability predicts 6% of motivation/ action to learn and planning/goal-setting, and predicts 4% of the lack of self-directedness subscale; locus of causality predicts 9% of strategy using/evaluation, and 8% of total self-regulated learning skills. The results of the regression

Table 7. Correlations for the self-regulated skills, attributions relating to failure and academic achievement.

S/N	Self-regulated skills	2	3	4	5	6	7	8	9	10
1	Motivation and action to learning	0.480**	0.591**	-0.297**	0.719**	-0.123	0.101	0.078	-0.039	0.147
2	Planning		0.660**	-454**	0.786**	-0.003	0.047	0.013	0.035	0.379**
3	Strategy using and assessment			-437**	0.906**	-0.004	0.075	-0.033	0.035	0.243*
4	Lack of self-directedness				-0.208*	0.094	-0.055	-0.005	-0.033	-0.169
5	Total self-regulated skills					-0.004	0.074	0.001	0.016	0.277**
6	Locus of causality						-0.562**	-0.057	0.588**	-0.054
7	External control							0.133	-0.421**	0.073
8	Stability								-0.270**	0.014
9	Personally controllable									0.041
10	Academic achievement						-0.562**	-0.057	0.588**	-0.054

*p<.05; **p<.01.

Table 8. Stepwise regression analysis of self-regulated skills on attribution.

Model	Motivation and action to learning			Planning			Strategy using and assessment			Lack of self-directedness			Total self-regulated skills		
	1 st Step			1 st Step			1 st Step			1 st Step			1 st Step		
	β	t	p	β	t	p	β	t	p	β	t	p	β	t	p
Stability	0.182	2.88	**	0.281	2.85	**	0.573	3.55	***	-0.186	-2.23	*	0.849	3.39	***
ΔR		0.065			0.064			0.095			0.040			0.080	

*p< 0.05; **p< 0.01; ***p < 0.001.

Table 9. Stepwise regression analysis of self-regulated skills on academic achievement.

Model	Academic achievement		
	1 st Step		
	β	t	p
Planning	0.182	4.08	***
ΔR		0.135	

***p < 0.001.

performed in order to find out how far self-regulated learning skills dimensions predict academic success show that the planning/goal-setting subscale predicts 13% of academic success (Table 9).

DISCUSSION

In the discussion of what standards teachers and trainee teachers of gifted and talented students should meet, standards (in terms of both knowledge and skills) in matters such as the creation of environments in which pupils can work independently, awareness of individual differences and the necessity to activate pupils' motivations were cited (Van Tassel-Baska and Johnsen, 2007). It is thought that in order for a teacher to come up to these standards, the basic requirement is that s/he should first possess these skills her/himself. It is within this context that in the current study, the self-regulated learning skills and causal attributions of individuals preparing to teach gifted and talented students are examined based on sex and class-level variables; the relationships between self-regulated learning skills, causal attributions and success are explored, and the question of to what extent self-regulated learning skills and causal attributions predict success is addressed.

When the self-regulated learning skills of trainee teachers were analyzed based on sex variable, significant findings showing higher scores for girls in the majority of sub-skills were obtained. The findings of the current study are in parallel with those of a number of other studies (Wolters, 1999; Zimmerman and Martinez-Pons, 1990). The findings of the research into university students' self-regulated learning skills carried out by Bidjerano (2005) show consistently higher, and significant, scores for girls in most of the subscales. It may be thought that this may be explained in terms of stereotyped views on how girls ought to behave in academic environments, where they are expected to be better-organized, better at planning, and able to make better use of a variety of strategies. In fact, in the studies carried out by Pajares and Valiante (2002), it is emphasized that the differences between the sexes seen in the academic environment are due not so much to these differences themselves, as to the expectations of society and to stereotyped attitudes, in the same way as girls are expected to be weaker than boys in subjects such as mathematics. Whatever the reason for the differences between the sexes in the matter of self-regulated learning skills may be, it is clear that male trainees preparing to be teachers of gifted and talented students need to develop these qualities in themselves. Thus, it is recommended that in future, male trainee teachers should undergo training designed to develop their self-regulated learning skills.

In the analysis of self-regulated learning skills based on the class-level variable, a significant difference was found

only in the lack of self-directedness subscale with regard to third-year students, who scored higher. Lack of self-directedness indicates a focus on the environment, as well as the feeling of a need for direction, in the taking of decisions with regard to learning (for example, decisions as to what is to be studied, and how). Although the study did not produce any findings in this matter, students in the third class year of the Gifted Teacher Training Program during the 2014 to 2015 academic year were seen by the researcher to be more in communication with the teachers in their department, and more open to guidance with respect to their future, in comparison with students in the other class years. The level of awareness of this issue among first- and second-year students was usually not high; however, as the future was more clear-cut for students in their fourth year, it is surmised that the difference observed in third-year students may be ascribed to a similar reason.

When the causal attributions for success and failure of trainee teachers of gifted students were examined, no difference was found with regard to sex. This finding parallels the results of the studies carried out by Koçyiğit (2011) and Can (2005). The findings of both studies and the current one may be said to have shown that sex does not affect causal attributions. In the comparison of class levels, differences were observed only in the locus of causality for causal attributions relating to failure, with first-year students recording higher scores. In the light of these findings, it was established that for first-year students just starting the program (in comparison with students in other class years), the locus of causality with regard to failure is more internal in nature, that is, when they experience failure, they find the cause in themselves rather than seeking it in external factors. As they move up the class levels, students tend to attribute failures more to external causes such as 'the teacher for the subject' or 'bad luck'. First-year students, who have recently been through the process of taking the university entrance examination, have had recent experience of the fact that in the struggle to get into university, the only variable is the degree of effort they themselves put forth. It is thought, however, that as time goes on there will be a greater tendency for them to attribute failures, in particular, to external factors.

In the matter of the relationships between self-regulated learning and causal attributions relating to success, we see a positive correlation between motivation, planning/goal-setting, strategy using / assessment and total self-regulated learning on the one hand, and locus of causality, stability and personal control on the other. This shows that in accordance with expectations, as the locus of causality becomes more and more internal, as personal control grows and as stability is perceived more and more as permanent, self-regulated learning skills (with the exception of lack of self-directedness) increase. The desired aim is to ensure that students in all groups are self-regulated, and that they

possess internal motivation. In fact, the findings of a number of studies mention the effect that inner motivation has on success (Gottfried, 1983; Zimmerman and Martinez-Pons, 1988). Also, quite a large number of self-regulated learning models especially that of Zimmerman (2010), draw attention to the individual's inner processes. Although self-regulated learning develops for the most part from skills learned from external sources, it is a process that comes about within the individual. Thus, it is to be expected that individuals whose causal attributions are internal, who see themselves as the source of personal control and who are aware of the importance of stability, should possess a higher level of self-regulated learning skills. The point that needs to be emphasized here is the necessity for measures to be taken so that individuals who have negative causal attributions receive training in order to improve their self-regulated learning skills.

In search of determining to what extent causal attributions relating to success predict self-regulated learning skills, it is apparent that stability predicts the subscales of motivation/action to learn, planning/goal-setting, strategy using/assessment, and lack of self-directedness; locus of causality predicts strategy using/assessment and total self-regulated learning skills. Causal stability is related to whether or not an attributed cause is subject to change (Feshbach and Weiner, 1991). In this context, it may be said that stability in the matter of giving importance to external factors when decisions on motivation, planning and learning are taken is important from the point of view of the displaying of self-regulated learning skills. It may be thought that the more stable a person is, the better s/he will perform in these three lower dimensions. As Pintrich (2004) points out, one of the commonly-held assumptions on the subject of self-regulated learning skills is that students are in control of their own studies, and that they possess self-observation skills. The findings of the current study tend to support this assumption. When students are planning their own learning and are motivating themselves, etc., they have the potential to be stable. In the same way, to the extent that they find the locus of causality in themselves, they are also able to control their self-regulated learning. In this regard, the important thing is that trainee teachers should be provided with training designed to show them that they possess this potential. Only in this way might it be possible for them to pass these skills on to their own pupils in the future.

Zimmerman and Schunk (1989) were among the first who studied the relationship between self-regulated learning and academic success. The current study, paralleling the findings of various different studies based on different populations (Garrido-Vargas, 2012), has also identified a positive correlation between self-regulated learning components and academic success. However, the current study shows that only the planning/goal-setting dimension predicts success. In fact, the finding of the study carried out by Turan and Demirel (2010) is that the

group that had significantly higher academic achievement also had higher scores in the planning/goal-setting subscale than other groups. This finding underlines once again the importance of planning and goal-setting for success (Pintrich, 2000).

Finally, some limitations with regard to the study need to be touched on. The fact that pen-and-paper tests were used may be thought of as a limitation. However, this is only one of the limitations that social sciences inevitably bring with them. In addition, the fact that students' levels of academic success were calculated according to the GPA scores obtained may be seen as another limiting factor. Lastly, the study was limited to students attending to the gifted teacher training program at only one university. One of the most important reasons for this was that at other universities in our country, this undergraduate program has not yet produced any graduates.

Conclusion

In view of the findings of the current study, it is considered of great importance that individuals training to be teachers of gifted and talented children should have their causal attributions, and especially their self-regulated learning skills improved and developed. In this regard, it is recommended that future studies should include experimental work, and that training programs designed to develop these skills in trainee teachers should be prepared and carried out. In conclusion such training programs could help teachers of gifted and talented children to achieve the necessary standards, and that as a result these teachers could be able to educate students with special needs of this kind in a more effective way, and indeed, the studies carried out by Hansen and Feldhusen (1994) lend support to this belief.

Conflict of Interests

The author has not declared any conflicts of interests.

REFERENCES

- Bettman JR, Wietz BA (1983). Attributions in the board room: causal reasoning in corporate annual reports. *Administrative Sci. Q.* 28(2):165-183.
- Bidjerano T (2005). Gender differences in self-regulated learning. Paper presented at the 36th Annual meeting of the Northeastern Educational Research Association, Kerhonkson, NY.
- Blefare, Michael A (1994). An Examination of Weiner's Attribution of Emotions and Achievement Motivation in A Classroom Context, Thesis (M.A. (Ed.)), Simon Fraser University.
- Boekaerts M, Zeidner M, Pintrich PR (2000). *Handbook of self-regulated learning*. Oxford, UK: Academic Press.
- Buchanan GM, Seligman ME (1995). *Explanatory style*. Hillside, NJ: Erlbaum.
- Can B (2005). An analysis of elementary school teachers' causal attributions related to self-identified success and failure. (MA), Boğaziçi, Istanbul.

- Feldhusen JF (1997). Educating teachers for work with talented youth. In N. Colangelo and G. A. Davis (Eds.), *Handbook of gifted education* (2 ed.). Boston Allyn & Bacon.
- Karasar N (1994). *Bilimsel araştırma yöntemleri*. Ankara: Nobel Yayın Dağıtım.
- Karasar N (2009). *Bilimsel araştırma yöntemleri*. Ankara: Nobel Yayınları.
- Kızgın Y, Dalgın T (2012). Affetme teorisi: öğrencilerin başarı ve başarısızlıklarını değerlendirmedeki affetme farklılıkları. *ZKU J. Social Sci.* 8(15):62-77.
- Koçyiğit M (2011). Üniversite öğrencilerinin nedensel yüklemeleri ve öğrenme stilleri. (MA), Afyon Kocatepe, Afyonkarahisar.
- McAuley E, Duncan TE, Russell DW (1992). Measuring causal attributions: the revised causal dimension scale (CDSII). *Personality Soc. Psychol. Buletin*, 18(5):566-573.
- Nokelainen P, Tirri K, Merenti-Valimaki HL (2007). Investigating the influence of attribution styles on the development of mathematical talent. *Gifted Child Q.* 51(1):64-81.
- Nota L, Soresi S, Zimmerman BJ (2005). Self-regulation and academic achievement and resilience: a longitudinal study. *Int. J. Educ. Res.* 41(3):198-215.
- Pajares F, Valiante G (2002). Students' self-efficacy in their self-regulated learning strategies: A developmental perspective. *Psychologia* 45:211-221.
- Perels F, Dignath C, Schmitz B (2009). Is it possible to improve mathematical achievement by means of self-regulation strategies? Evaluation of an intervention in regular math classes. *Eur. J. Psychol. Educ.* 24(1):17-31.
- Peterson C, Barret LC (1987). Explanatory style and academic performance among university freshmen. *J. Personality Soc. psychol.* 53:603-607.
- Pintrich PR, De Groot EV (1990). Motivational and self-regulated learning components of classroom academic performance. *J. Educ. Psychol.* 82(1):33-40.
- Robinson A (2008). Teacher characteristics. In J. A. Plucker and C. M. Callahan (Eds.), *Critical issues and practices in gifted education: what the research says Texas*: Prufrock pp. 669-681.
- Satterfield JM, Monahan J, Seligman ME (1997). Law school performance predicted by explanatory style. *Behav. Sci. Law* 15:95-105.
- Schulman P (1995). Explanatory style and achievement in school and work. In G. M. Buchanan and M. E. Seligman (Eds.), *Explanatory style* Hillside, NJ: Erlbaum. pp. 159-171.
- Schunk DH (1996). Goal and self-evaluative influences during children's cognitive skill learning. *Am. Educ. Res. J.* 33(2):359-382.
- Stipek DJ (1988). *Motivation to learn from theory to practice*. Boston: Allyn & Bacon.
- Stoeger H (2013). Learning as a creative process. In: A. Tan (Ed.), *Creativity, talent and excellence* Singapore: Springer. pp. 3-13.
- Stoeger H, Sontag C (2012). How gifted students learn: A literature review. In A. Ziegler, C. Fischer, H. Stoeger and M. Reutlinger (Eds.), *Gifted education as a lifelong challenge. Essays in honour of Franz J. Mönks* Germany: Muenster: LIT. pp. 315-336.
- Turan S (2009). *Probleme dayalı öğrenmeye ilişkin tutumlar, öğrenme becerileri ve başarı arasındaki ilişkiler*. (Phd), Hacettepe, Ankara.
- Turan S, Demirel O (2010). The relationship between self-regulated learning skills and achievement: a case from Hacettepe University Medical School. *Hacettepe University J. Educ.* 38:279-291.
- VanTassel-Baska J, Johnsen SK (2007). Teacher education standards for the field of gifted education: a vision of coherence for personnel preparation in the 21st century. *Gifted Child Q.* 51:182-205.
- Weiner B (1985). An attributional theory of achievement motivation and emotion. *Psychol. Rev.* 92(4):548-573.
- Weiner B (2000a). Attributional thoughts about consumer behavior. *J. Consumer Res.* 27(3):382-387.
- Weiner B (2000b). Intrapersonal and interpersonal theories of motivation from an attributional perspective. *Educ. Psychol. Rev.* 12(1):1-13.
- Wendel AJ, Heiser S (1989). Effective instructional characteristics of teachers of junior high school gifted students. *Roeper Rev.* 11:151-153.
- Wolters A (1999). The relation between high school students' motivational regulation and their use of learning strategies, effort, and classroom performance. *Learn. Individ. Diff.* 11(3):218-299.
- Yıldırım A, Şimşek M (2008). *Sosyal bilimlerde nitel araştırma yöntemleri* Ankara: Seçkin Yayıncılık.
- Ziegler A, Stoeger H, Vialle W, Wimmer B (2012). Diagnosis of self-regulated learning profiles. *Austr. J. Gifted Educ.* 21(2):62-74.
- Zimmerman BJ (1986). Development of self-regulated learning: which are the key sub-processes? *Contemp. Educ. Psychol.* 16:307-313.
- Zimmerman BJ (1998). Academic studying and the development of personal skill: a self-regulatory perspective. *Educ. Psychol.* 5(2/3):73-86.
- Zimmerman BJ (2000). Attaining self-regulation: A social cognitive perspective. In: M. Boekaerts, M. Zeidner and P. Pintrich (Eds.), *Handbook of self-regulation*. Oxford, UK: Academic Press.
- Zimmerman BJ, Martinez-Pons M (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *J. Educ. Psychol.* 82(1):51-59.
- Zimmerman BJ (1986). Development of self-regulated learning: Which are the key sub-processes? *Contemporary Educ. Psychol.* 16:307-313.
- Zimmerman BJ (1998). Academic studying and the development of personal skill: A self-regulatory perspective. *Educ. Psychol.* 5(2/3):73-86.
- Zimmerman BJ (2000). Attaining self-regulation: A social cognitive perspective. In: M. Boekaerts, M. Zeidner ve P. Pintrich (Eds.), *Handbook of self-regulation*. Oxford, UK: Academic Press.