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A Research on Relationship between the Sbs Exam Success and Creativity Level of 8 Grade Private School Students

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Abstract
The goal of the research is to investigate the relationship between the creative thinking skills and SBS exam success of primary school students. The research sample group is comprised of 60 8th grade students at private schools in Gaziantep in 2009-2010 Educational Year. The methodology of the research is mixed research method. Torrance Creative Thinking Test applied to students in order to collect data about the level of creative thinking skills of the students. The information about the students was obtained from ILSUS Student Registration System. A correlation was utilized to analyze the relationship between the creative thinking sub-dimensions of fluency, flexibility, and originality and SBS success. The findings of the research demonstrate that there is a significant positive relationship between the flexibility aspect of the students' creativity and SBS success on the subjects of Turkish, Math, Science and Social Sciences and also that there is a significant positive relationship between the originality aspect of the students' creativity and SBS exam success on the subjects of Math and Social Sciences. The means of creative thinking skill levels of the students were compared and it was observed that the mean of fluency is the highest and the mean of flexibility is the lowest.
Keywords: Creativity, fluency, flexibility, originality, academic success, examination success

1. Introduction

In this era, knowledge is developing very fast, and in order to catch up with this quick change, it is necessary for societies to be made up of individuals who think creatively, act vigorously, manage to solve problems effectively and adapt themselves to changes easily. As for the upbringing of such individuals, schools are required to encourage such skills, and it is necessary for the education system to be prepared in a way to serve this purpose. Nowadays, the features of creativity which are mentioned above are widely accepted, but there has been a debate on how to bring up individuals with such qualities. It has been stated that creativity, as well as being an inherent ability, is learnable and can be improved if proper programs are developed and if a proper environment is created (Yavuzer 1996; Karakuş 2001). The importance of the improvement of creativity has also been emphasized in the new education program. (MEB, 2007).Constructivist programs aims to improve the creativity of students and make them learn through experience. However, the anxiety about exam results is an ongoing problem among instructors, parents and students. It is a common idea among instructors that it takes too much time to apply methods that improve creativity, that these methods do not help with the preparation for exams, and that application of multiple choice tests and similar time-saving practices help students better to bring about success.
Recent studies show that schools with higher academic success are more successful in central exams (Deniz and Kelecioğlu 2005; Büyüköztürk and Deryakulu, 2002). There are many factors that affect students' academic success and in connection with this, their success in central exams. We can make three groups for the factors that affect students' academic success: factors about school, factors about family and factors about the individual. The efficiency of the physical atmosphere and technological equipment of the school, professional competence of the instructors, the sufficiency of the number of instructors and instruments, provision of appropriate educational environment, application of methods and techniques appropriate for the topic and students are the school environment factors that affect academic success. Factors like the education level of the family, family income, the importance they give to the education of students, the way they communicate with them, provision of suitable working environment can be examples of family factors that could affect academic success. (Özer 1999). Besides, it has been noted that factors like the education level of family and their levels of income affect students' academic success in central exams (Öksüzler and Sürekçi 2010). Factors like cognitive, physical and emotional maturity, self-confidence, anxiety level, atychiphobia, sense of responsibility; readiness level, motivation, intelligence and creativity are the individual factors that affect students' academic success (Özer 1999; Sternberg 2003). One of the factors that affect students' academic success may be the level of creativity.
Creativity is a skill to design and form something new and it is a skill that everyone is considered to have (Türk Dil Kurumu 1995). Creativity has four dimensions. These dimensions are fluency, originality, flexibility and enrichment. Fluency is the ability to quickly sort out the ideas in a topic; originality is the ability to produce

unique answers; flexibility is the ability to adapt to the changing conditions (Senemoğlu 1999) and enrichment is the ability to amplify an idea and add details to it (Davaslıgil 2008).

When the studies about creativity are examined, it is seen that this topic has attracted the attention of many researchers. Many of these studies analysed the relationship between creativity and intelligence (Sungur 1997; Stenberg 2003; Ivcevic, Brackett and Mayer 2007; Horan 2007; Freund and Holling 2008; Sheykhmounesi, Shahsavari, Jafarzadeh and Khademlo 2010). In addition to these studies, there have been some studies that analyzed the effetcs of different teaching tecniques (Kaptan and Kuşakçı 1990; Ülgen 1995; Kaptan and Korkmaz 2002; Aral, Akyol and Sığırmaç 2006; Yılmaz 2006; Atasoy, Kadayıfçı and Akkuş 2007; Yaman and Yalçın 2010) and family on the improvement of creativity level (Öztunç 1999; Konak 2010). The vast majority of the researches concentrated on the relationship between gender and creativity (Baer 1997; Ai 1999; Aral 1999; Aydın and Canel 2002; Öncü 2003; Gülel 2006; Kaufman 2006; Keller, Lavish and Brown 2007; Oral, Kaufman and Agars 2007; Aral and Yaşar 2010).

When the studies on the relationship between students' creativity level and academic success are analyzed, it is seen that there is a significant positive relationship between students' creative thinking skill levels and academic success (Ai 1999; Blumen 2002). In other words, the level of academic success also increases when the level of creativity increases.

1.1.What Is Creativity?

Creative ability underlies all the aspects of human life and development. It is believed that it is only possible to find solutions to the problems of people today who live in a world ruled by constant change and competition with the help of creativity. This means that creativity is accepted to be an ability that can come out at any time of human life, not only at specific times (San 1985; Davaslıgil 1991).

1.1.1.The Dimensions of Creativity

Creative thinking skills have four dimensions, which are fluency, flexibility, originality and enrichment.

1.1.1.1.Fluency

Fluency can be defined as the ability to produce a large number of ideas to an open-ended question orally or in writing. In other words, it is the number of related ideas produced. For example, the answer "for home, school, garage, fireplace, wall construction" to the question "For what purpose can we use clay?" is in the category of thinking fluently. Numerouside as have been proposed, but they all remained within the framework of a similar use (Aslan 2001). In other words, a student who can come up with ten possible solutions to a problem in five minutes has a higher level of creativity in terms of the dimension of creative fluency compared to the student that comes up with five possible solutions to this problem in five minutes (Rıza 1999).

1.1.1.2.Flexibility

Flexibility is the ability to produce ideas belonging to different categories. For example, when a person has one category about games and another about houses while generating ideas on how to use cartons, this person is using his creative flexibility. A very low level of flexibility shows that this individual has a rigid thinking pattern. A high level of flexibility defines a person who is discursive and can not focus on an idea long enough to develop it. Producing different approaches to a problem, coming up with different dimensions to the problem, and approaching a situation from different perspectives are the criteria that present fluency in thought (Atasoy, Kadayıfçı and Akkuş 2007).

1.1.1.3 Originality

Originality refers to thinking what is beyond the known, simple and anonymous. In other words, it is the ability to produce unique and extraordinary ideas (Çağlar 2009). When the number of people who think of a specific idea is smaller, this idea is accepted to be more original (Atasoy, Kadayıfçı and Akkuş, 2007). Originality requires an ability to come up with original answers, to delay instant needs and to get away from what is accepted to be known and traditional (Sungur 1997, p. 211). According to Guilford, if an idea is original, it is a rare idea among the other ideas produced in that society. In other words, originality is in the variety and novelty of an idea. For instance, if 95 percent of the people that produce ideas on how to use cartons think of using these cartons for nursery, this idea can not be considered very original. If only 3 percent of these people think of this idea, it considered to be very original (Parham 1988, p. 280).

1.1.1.4 Enrichment

Enrichment is the ability to amplify an idea and add details to it (Davaslıgil 2008). For example, when some children are shown a toy elephant and asked to make some smart, interesting and unusual changes and to list them, they are provided with an object to change. The object produced is the result of the enrichment dimension of creativity.

1.1.Primary School Exam System

Placement Exam (SBS) is an exam that was put into practice during the 2007-2008 academic years in Turkey. SBS is a central exam held at the end of an academic year testing all compulsory subjects except Visual Arts,

Technology and Design, Music, Physical Education, and Counseling/ Social Activities for 6th, 7th and 8th grade students. Placement exams are given in order to determine the level of student success based on the targets stated in the education program. This exam system is developed in order to evaluate students based on the process they go through in the new education system (Çelik 2007). The system is prepared by using the experiences and questions as well as the education program of that year as a base, and it aims to evaluate the students' ability to interpret, to analyze, to think critically, to predict results, to solve problems and so on. Exam questions might differ in number according to classes (MEB, 2007). The exam has been abolished from use for sixth grade students from 2010-2011 academic years on and for 7th grade students from the 2011-2012 academic years on.

1.2.Research On The Relationship Between Academic Success And Creativity

The relationship between academic success and creativity has been an interesting
subject for many researchers in Turkey and abroad. In one study of 389 students on the relationships between creativity and academic success and teacher attitude, there has been found a low but significant relationship between students' creativity and academic success (Erdoğdu 2006). In a separate study of the creativity level of classroom teachers based on their perceptions about their own academic success, it has been noted that the ones with high perception level of academic success had higher level of creative thinking (Gülel 2006).

Ai conducted research examining the relationship between the creativity and academic
success of 2264 students from 68 different schools in Los Angeles. At the end of his research, he noted that creativity is a factor that affects the academic success of both female and male students. He has also pointed out that there is a higher positive relationship between academic success and the fluency dimension of creativity for male students and a higher positive relationship between academic success and the enrichment dimension of creativity for female students. Besides, it has also been noted that there is a significant positive relationship between the fluency dimension of creativity and academic success in science and Math classes for female students (Ai 1999).

Another study conducted in Peru examined the effects of teacher training seminars on the academic success, cognitive level and creativity of some gifted and other second grade students who attend the same class. At the end of this research conducted on 231 second grade students, it has was concluded that when gifted students are encouraged more in terms of their creativity, they show even more superior capabilities. Moreover, it has been noted that the development of creativity increases academic success and develops the problem-solving skills of both gifted and normal students (Blumen 2002). In the research in which Stenberg examines creative thinking in the classroom atmosphere, participants consisted of 326 high school students. In the study, it was emphasized that creative thinking is different from intelligence, analytical and practical thinking. It has been stated that in the classrooms where creative ideas are encouraged and rewarded, creativity develops more and academic success increases. In addition, it has been argued that creativity has different dimensions and that the teacher is supposed to place emphasis on all these dimensions in order to help students develop their creativity (Stenberg, 2003). The result of a study conducted on 1113 students having finished fourth grade in Germany shows that although intelligence is a more important factor than creativity, there is a significant positive relationship between creativity and academic success and creativity develops more in classes in which the teacher gives importance to the creative ideas of students (Freund and Holling 2008).

Despite the results of the research mentioned above, there are some studies which have concluded that there is not a significant relationship between creativity and academic success. For example, Bentley has pointed out that academic exams are made up of comprehension and memorization based questions, and in his research he confirms that there is not a relationship between creativity and comprehension and memorization (Bently 1966). These studies have been conducted on students of different ages and in the majority of the research, it has been stated that there is a significant positive relationship between the dimensions of creativity and academic success.

This research seeks to discover whether there is a significant relationship between the creativity levels of students and their SBS success. For this purpose, the answers to the following questions have been searched.

1. Is there a significant relationship between SBS success and the creativity level of 8th grade students attending private schools?
   a. Is there a significant relationship between the originality sub-dimension of students' creativity and their SBS success in Maths, Science, Social Studies, Turkish and English?
   b. Is there a significant relationship between the fluency sub-dimension of students' creativity and their SBS success in Maths, Science, Social Studies, Turkish and English?
   c. Is there a significant relationship between the flexibility sub-dimension of students' creativity and their SBS success in Maths, Science, Social Studies, Turkish and English?

2. Method

The methodology of the research is mixed research method. A mixed research method is a research method in which qualitative and quantitative methods are used together (Somekh and Lewin 2004). The qualitative part the

research was conducted with the case study of qualitative research patterns. As for the evaluation of the results of Torrence Creative Thinking Test applied to students, a quantitative method was used.

A case study pattern is a commonly used approach in qualitative studies, and it is available in various patterns. This research has been conducted with the application of "holistic single case pattern" out of many case study patterns. In the holistic single case pattern, a single institution, individual, school or program is analyzed. This pattern does not meet the generic standards, so it is only used to study specific situations.

The study group of the research consists of 60 eighth grade students attending the private school called Sanko in Şehitkamil district of Gaziantep, Turkey for 2009-2010 academic year. All of the students in the study were born in 1996. The number of siblings and the distribution of the students based on their gender are shown below in Table 2.1.

Table 2.1. The Distribution of the Study Group Based on Their Gender and Number of Siblings

		n	%
NUMBER OF SIBLINGS	An only child	2	3,3
	1 sibling	32	53,3
	2 siblings	21	35
	3 siblings	4	6,7
	4 siblings	1	1,7
GENDER	Male	29	48,3
	Female	31	51,7

As shown in Table 2.1, 52 % of the study group consists of female students, and 48 % of male students. When the study group is analyzed in terms of number of siblings, it can be seen that 3,3 % of the students included in this study are an only child; 53,3 % of them have one sibling, 35 % of them have two, 6,7 % have three and 1,7 % have four siblings.

The education level and employment status of the students' parents have been analyzed and are given below in Table 2.2.

Table 2.2. The Distribution of the Parents of the Study Group Based on Their Education Level and Employment Status

	MOTHER		FATHER	
	N	%	n	%
WITHOUT UNIVERSITY DEGREE	32	53,33	25	41,67
WITH UNIVERSITY DEGREE	28	46,67	35	58,33
UNEMPLOYED	38	63,33	-	-
EMPLOYED	22	36,67	60	100

As it is stated in Table 2.2., when the study group is analyzed in terms of the percentage of education level of the mothers, it can be seen that 46, 67 % of them are university graduates and 53,33 % of them do not have university degrees. When the education levels of fathers of the students included in the study are analyzed, we can see that 41, 67 % of them are university graduates and 58, 33 % do not have university degrees. 36, 67 % of the students that make up the study have employed mothers, 63, 33 % have unemployed mothers. All fathers are employed.

In the research, Verbal A and Figural A form of "Torrence Creative Thinking Test" have been used as data collection tool. Information about the SBS results of the students included in the study group, their parents' education levels, the employment status of the mother, the gender of the students and the number of siblings has been obtained from ILSUS Student Registration System, school administration and guidance service of the school.

The Torrence Creative Thinking Test (TCTT) was developed by Torrence and published for the first time in the USA in 1966 (Torrance 1966:akt. Aslan 2001). The Torrence Creative Thinking Test is made up of two tests and ten activities; the verbal sub-test consists of seven activities and the formal sub-test consists of three activities. These verbal and formal sub-tests also have A and B forms and these forms are identical. The activities of this test aim to test the four sub-dimensions of creativity, which are fluency, flexibility, originality and enrichment. The test was adapted into Turkish by Aslan (2001). For this study, the inner coherence method has been applied for reliability. In the analysis, correlation coefficients have been obtained with the use of Guttmann, Cronbach Alfa and Spearman Brown techniques. The Guttmann coefficient has been found to be 0.89 for verbal fluency questions; 0, 62 for verbal flexibility questions; 0,56 for verbal originality questions and 0,51 for figural form. The Cronbach Alfa coefficient is 0,86 for verbal fluency questions; 0,74 for verbal flexibility questions; 0,73 for verbal originality questions and 0,64 for figural form. As for the Spearman Brown coefficient obtained at the end of the research, it is 0, 89 for verbal fluency questions; 0, 68 for verbal flexibility questions; 0,57 for verbal

originality questions and 0,74 for figural form. In the studies of adaptation of the scale into Turkish, adequate conclusions in terms of linguistic equality, reliability and validity have been attained (Aslan 2001). In addition, this test has been used in different studies in Turkey and its validity and reliability have been identified (Öztunç 1999; Emir 2001; Kaptan and Korkmaz 2002; Gülel 2006).

In this research, after the verbal and figural subtests of The Torrence Creative Thinking Test's Form A were applied to 60 eighth grade students, each test was evaluated and graded by experts. Every question in the test had some answers that evaluated the dimensions of creativity. For every answer that was appropriate for these dimensions, students received points. After all the questions were evaluated in this way, the total point for every dimension was calculated. In other words, after the answers were graded one by one according to each creativity dimension, each student's creativity score for fluency, flexibility and originality was found depending on the answers he or she gave for both forms. The dimension of productiveness was not included in the study. If the student achieved a score above the average for any dimension of creativity, this student was categorized "creative" in that dimension. The Pearson Correlation Coefficient was used in examining the relationship between SBS success and fluency, flexibility and originality sub-dimensions of creativity.

3. Findings

In order to better interpret the creativity level of the study group, the average of creativity was calculated first. The group averages for the fluency sub-dimension of creativity was 64.7(SS= 17.46), for originality sub-dimension 44.6(SS= 14.69) and for flexibility sub-dimension 16 (SS= 3.98). As a result, it has been inferred that the highest dimension of creativity of the working group is fluency while the lowest one is flexibility.

The analysis results of the problems and sub-problems of the research are presented below in Table 3.1.

Table 3.1.The Correlation between SBS Success of the Students and Their Fluent, Original and Flexible Thinking Levels

	1	**2**	**3**	**4**	**5**	**6**
1. TURKISH						
2.MATHS	.605**					
3. SCIENCE	.513**	.774**				
4.SOCIAL STUDIES	.665**	.703**	.688**			
5. ENGLISH	.557**	.380**	.537**	.543**		
6. SBS	.777**	.936**	.862**	.847**	.581**	
7.ORIGINALITY	.205	.259*	.150	.262*	.131	.238
8. FLUENCY	.059	.132	.071	.187	.155	.126
9. FLEXIBILITY	.360**	.432**	.319*	.420**	.154	.418**

* p< .05
** p< .01

According to Table 3.1,

1. There is a medium significant positive relationship (r= .418, p< .05) between the flexibility dimension of creativity and SBS success.
2. There is a low and insignificant relationship (r= .238, p> .05) between the originality dimension of creativity and SBS success.
3. There is a significant but low relationship (r= .126, p> .05) between the fluency dimension of creativity and SBS success. According to the findings based on the relationship between the originality sub-dimension of creativity levels of the students and their SBS success in Maths, Science, Social Studies, Turkish and English there is a low level of significant positive relationship between the originality sub-dimension of creativity and SBS Maths success (r=.259, p< .05) and social science success (r= .262, p< .05). However, there is no low level of significant relationship between the originality sub-dimension of creativity and SBS Turkish(r= .205, p> .05), science (r= .205, p> .05) and English (r= .131, p> .05) success.

When the significant relationship between the fluency sub-dimension of students' creativity levels and their SBS success in Maths, Science, Social Studies, Turkish and English is analyzed, there was found to be a low and insignificant relationship between this dimension and their SBS success in Maths (r= .132, p> .05), science (r= .071, p> .05), social studies (r= .187, p> .05), Turkish (r= .059, p> .05) and English (r= .155, p> .05).

As for the findings obtained when the relationship between students' SBS success in Maths, Science, Social Studies, Turkish and English and the flexibility sub-dimension of their creativity level was evaluated, there is a medium significant positive relationship between this sub-dimension and SBS success in Turkish (r= .360,

p< .01), Maths (r= .432, p< .01), Science (r= .319, p< .05) and Social Studies (r= .420, p< .01). In addition, there is a low and insignificant relationship between this sub-dimension and SBS success in English.

4. DISCUSSION

Before starting the discussion of these findings, it is better to analyze the averages of students' creativity dimensions in general, as these findings provide information on which dimensions of academic success a students' creativity level intensifies, and it helps us to recognize our study group. When the averages of students' creativity dimensions are compared, it has been established that the average of fluency is the highest while the average of flexibility is the lowest. In other words, while the students in this study have the ability to produce ideas to an open-ended question orally or in writing, their ability to approach a subject from different perspectives is limited. This tendency might be the result of our education system and our expectation from our students.

At the end of this study, it has been found that there is a medium significant positive relationship between the flexibility dimension of creativity and SBS success. However, there is no low level of significant relationship between the originality and fluency sub-dimensions of creativity and SBS success. In other words, it is possible that the students with higher level of flexibility will be more successful in SBS. The flexibility dimension of creativity is about the ability to produce ideas belonging to different categories. In our education program, more importance is given to interdisciplinary interaction, and answering the questions in SBS requires the combination of information from different disciplines. For example, the solution to a problem in science might require some graphic knowledge learned in Maths class, or when students create a cell model in visual arts class, this might facilitate the solution of a question about cells in science. Therefore, it is more likely that students who think in a more flexible way and do not have a rigid pattern of thinking will be successful in SBS.

In the literature, there has yet to be a study that analyzes the relationship between the sub dimensions of creativity and SBS success. For this reason, the studies that investigate the relationship between the sub dimensions of creativity and academic success. The findings of the research about this subject in Turkey and abroad support the findings of this study to some extent. For example, Erdoğdu (2006) has found that there is a low but significant relationship between students' creativity and academic success in his study 389 of primary school 5th grade students. Gülel (2006) has found that there is a significant positive relationship between students' perception of their academic success at university and their creativity levels. Moreover, in the studies conducted abroad, there has been found a significant positive relationship between academic success and creativity (Ai 1999; Blumen 2002; Stenberg 2003; Freund and Holling 2008). In contrast, Bentley (1966) found that there is not a relationship between creativity and comprehension and memorization. He has pointed out that academic exams consist only of questions based on comprehension and memorization, so there is not a significant relationship between creativity and academic success. Our education system centers on learning by experience far from memorization. For this reason, the research made by Bentley produces a result directed at classical education system.

When the relationship between the dimensions of creativity and SBS success are analyzed in terms of lessons, the findings given below are obtained.

It has been found that there is a low but significant positive relationship between the originality sub dimension of creativity and SBS success in Maths and social studies; however, there is not a significant relationship between this dimension of creativity and SBS success in Turkish, Science and English. Originality is the ability to think beyond what is known, simple and anonymous (Çağlar 2009). Original thinking requires abstract thinking, and Maths is an abstract lesson. The ability for abstract thinking is crucial to solve geometry questions in that area. Questions in the social studies area, especially history questions, again require abstract thinking skills, because the events that occurred in the past help students comprehend the topic and answer questions by imagining and relating the information obtained from these past events to present-day topics. For this reason, it might be expected that students with a higher level of original thinking become more successful in areas that require abstract thinking than other students.

There also hasn't been found to be a relationship between the fluency dimension of creativity and SBS success in Turkish, Maths, science, social studies or English. Ai (1999) analyzed the relationship between creativity and academic success on 2223 students attending different schools in America. At the end of this research, he has found a significant positive relationship between fluency dimension of creativity and academic success for male students, as well as a significant positive relationship between fluency dimension of creativity and academic success in science and Maths for female students. These results differed from the findings of --- research. The different results between these two studies might arise from difference in age groups of the participants and different education systems that they go through, as assessment and evaluation might reflect differences in the education systems.

When the relationship between the flexibility dimension of creativity and SBS success in different fields is

analyzed, it has been found that there is a medium significant positive relationship between this dimension of creativity and SBS success in Turkish, Maths and social studies. These findings match up with the findings obtained during the analysis of the first problem. It is expected that students with a higher flexibility dimension of creativity will become more successful in an education system based on interdisciplinary interaction, assessment and evaluation, as interdisciplinary interaction encourages students to get rid of a rigid thinking pattern and also matches up with the flexibility dimension of creativity. In this study, it has also been determined that there is not a significant relationship between the flexibility dimension of creativity and SBS success in English. As English questions in SBS are more based on knowledge, it can be said that there is not a significant relationship.

In accordance with these findings, the suggestions below are presented:

1. There is a medium significant positive relationship between students' flexibility dimension of creativity and SBS success. However, when the averages of students' creativity sub dimensions are compared, flexibility has the lowest average. Again, there has been found to be a medium significant positive relationship between students' flexibility dimension of creativity and SBS success in Turkish, Maths, science and social studies, and a low significant positive relationship between originality dimension of creativity and SBS success in Maths and social studies. Based on this research, the following recommendations can be made:
    - In order for students to be more successful in exams, activities that encourage students' flexibility dimension of creativity should be given more importance in the classroom.
    - Subjects can be taught with methods and techniques that improve the flexibility dimension of creativity.
    - Classroom atmosphere can be formed in a way that encourages and improves students' flexibility dimension of creativity.
    - Teachers might be trained at university or with inter service training after they start work about the strategies, methods and techniques that will improve students' flexibility dimension of creativity.
    - Teachers might be informed about how to form a classroom atmosphere that will improve students' flexibility dimension of creativity.
    - Families should be made aware of the importance of improvement of their children's flexibility dimension of creativity. They might also be informed about the attitudes, methods and techniques that will help their children improve this dimension.
2. There are many studies in Turkey and abroad on academic success and creativity, but this study is the first to analyze the relationship between central exam success and creativity. Further studies that analyze the relationship between creativity and student success in different central exams like LYS and YGS (university entrance exams in Turkey) should also be conducted.

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