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CONTENTS

INVESTIGATION OF THE RELATIONSHIP BETWEEN 5TH GRADE STUDENTS' SELF-EFFICACY AND ACADEMIC ACHIEVEMENTS FOR ENGLISH COURSE ACHIEVEMENTS

Abstract: In this study, it is aimed to determine whether the self-efficacy of the 5th grade students related to the acquisitions in the English course differentiates their academic achievements, to examine whether there is a significant relationship between their self-efficacy and their academic achievements, and to determine whether this relationship varies according to some variables. A correlational screening model is used to determine whether there is a relationship between students' English self-efficacy and their academic achievement. There is a significant relationship between English self-efficacy levels and academic achievement in English in terms of students' gender and parental education levels. The common influence of gender and English self-efficacy levels on students' academic achievement in English is significant. There is a significant difference in "understanding language, using language and feeling sufficient" sub-dimensions of the scale developed to determine the English self-efficacy according to the education level of the students.

Keywords: Self-efficacy, English proficiency, academic achievement

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INTRODUCTION

In order to keep up with the developing and changing world, it is inevitable for nations to learn other languages other than their mother tongue. Foreign language is the language that is not actively used for communication in the community, but learned to communicate with other nations, and foreign language learning is the most fascinating ability of human beings (Lightbown & Spada, 2006: 1; Taşkın, 2007: 1).

As in every country, Turkey gave importance to foreign language education. In the foreign language teaching process, the learning environment is very important for language teaching. The main thing is to acquire the language in a real and natural environment. However, when looking at language learning environments in Turkey, teaching is conducted in crowded classrooms, teacher-oriented and exam-based. In this process, it prevents the use of language as a communication tool. In order to eliminate these limitations, real and natural environments should be created whenever possible in foreign language teaching. In addition, foreign language is a skill learned by experiencing. That's why, foreign language teaching activities are carried out by teachers during the foreign language learning process and after completion, the students are left alone with them during the learning process. In order to provide effective learning in this process, students need to know themselves well and be aware of their own learning strategies. Oxford (1999) has defined language learning strategies as certain activities, behaviors or techniques that students use to improve their foreign language skills. Consequently, the learning process always starts with the learner. Regardless of the method or teacher, the learner should know himself well in the learning process. In order for the language learning process to pass actively and effectively, the learner must know his own learning strategy. Language learning strategies are the main factors in determining how and at what level students learn a foreign language (Oxford, 2003: 11). Therefore, when the learner chooses the appropriate learning strategies, these strategies become a useful tool in the learning process. Green (1982: 291) emphasized that when appropriate language learning strategies are used, individuals' proficiency levels and self-confidence increase. Language learning strategies are expressed as cognitive, metacognitive, emotional and social strategies (Oxford, 2003: 235-247). Metacognitive strategies help students organize their own cognition, plan and evaluate their communication (Green, 1982: 291). Purpura (1997: 289) defines strategies that involve planning to learn metacognitive strategies as an "executive" function as a term used in information theory to monitor the production or understanding of someone and evaluate learning, by thinking the learning process as it happens. Cognitive strategies are limited to certain learning tasks. Affective and social strategies that involve a more direct arrangement of learning material have to do with social mediation activity that interacts with others (Brown, 2000: 257). Metacognitive strategies help learners to organize their own cognitions, to focus and evaluate towards communicative competence. It provides affective strategies for students to actively participate in the language learning process and develop the self-confidence necessary for communicative competence. Social strategies help us to understand the feelings of the person in front of us in order to achieve communication competence. Being able to analyze the learning process is important to understand and remember new information and important functions to be good at using the new language using certain memory strategies.

In addition, one of the most important factors to access information is the individual's self-efficacy. In order to be active in the learning process and to produce knowledge, one has to make good use of his / her ability and capacity. At this point, the self-efficacy level of the individual is effective in reaching the information and achieving success. Therefore, the concept of self-efficacy is encountered in the field of education (Adıgüzel, 2017: 150). Self-efficacy belief is the basis of Social Learning Theory developed by Bandura (Bandura, 1977). Self-efficacy is the belief that a person can successfully perform a performance, and it is thought that a certain level of self-confidence is required in order to actively use the skills of the individual (Azar, 2010: 236). Students may think they have more or less proficiency than they need to be able to complete an action. In the study by Yang and Wang (2015: 35), the language

learning strategies of those who received foreign language education at the university examined the relationship between their English self-efficacy and it is determined that there is a positive relationship between them. Shi (2018: 724) examined the use of self-efficacy and language learning strategies of English language learners at the university in the United States. As a result of the study, it is determined that there is a significant relationship between these two. Magogwe (2007: 338), on the other hand, revealed a dynamic relationship between the use of language learning strategies and the belief in proficiency, schooling level (representing age differences) and self-efficacy. As it is seen, self-efficacy belief can affect the academic achievement of the individual by affecting the individual's use of his own learning strategy. In these studies, it is seen that students with high self-efficacy level used cognitive learning strategies more.

As the studies on self-efficacy level in foreign languages are few in our country, this study is aimed to be carried out in order to examine whether there is a significant relationship between individuals' English self-efficacy levels and their academic achievement in English.

IMPORTANCE AND PURPOSE OF THE RESEARCH

The aim of this study is to determine whether there is a significant relationship between these two concepts by determining the English self-efficacy levels and academic achievement of the 5th grade students in secondary school. In addition, based on this main purpose, it is determined whether the relationship determined varies according to some variables. Self-efficacy is the belief that students will be able to use their skills at the time of being prepared for and changing the situations (Yılmaz, Yiğit & Kaşarcı, 2017: 372). Self-efficacy level has a significant impact on learning. In addition to the great impact of students' self-efficacy levels on their learning processes, it has been observed in studies that self-efficacy levels increase their motivation towards students' language learning (Genç, Kuluşaklı and Aydın (2016: 53). For example, students with high levels of self-efficacy have higher success rates than others. That's why, students' self-efficacy levels should be increased throughout the language learning process. Therefore, this study is important for addressing the relationship between self-efficacy and academic achievement.

PROBLEM STATEMENT

Is there a significant relationship between English self-efficacy levels of the 5th grade students and their academic achievement in English in terms of various variables (gender, mother and father education level) ?

SUBPROBLEMS

1. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school?

2. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of gender?

3. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of mother's educational levels?

4. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of father's educational levels?

5. Is there a significant difference between the English academic achievement scores of the fifth grade students in secondary school according to their level of English self-efficacy and a common effect of gender?

6. Is there a significant difference between the English academic achievement scores of the fifth grade students in secondary school according to a common effect of English self-efficacy levels and mother's education levels?

7. Is there a significant difference between the English academic achievement scores of the fifth grade students in secondary school according to a common effect of English self-efficacy levels and father's education levels?

METHOD

In this study, the correlational screening model is used to determine whether the fifth-grade students' self-efficacy affect their academic achievement. In correlational screening models, it is aimed to determine the variation and degree between variables (Karasar, 2008: 77). In this model, it is dealt with how the opinions are distributed among individuals. In this study, this model has been used to describe the current situation of the fifth-grade students' English self-efficacy by looking at some variables.

SAMPLE

The working universe of the research consists of the fifth-grade students in secondary school providing education and training service in Karabük. There are 19.989 students in the fifth grade in the secondary schools in Karabük. The sample of the study consists of 650 students studying in 12 secondary schools determined by the appropriate sampling method in the districts of Central District, Safranbolu and Eflani in Karabük. Since a total of 18,689 students in the study universe are located in these districts, the number of students has been taken into consideration in the selection of the districts. The sample size table of Çılgı (1994: 25) is first examined for the number of samples, and it is decided that the sample number should consist of at least 644 people for 20,000 samples. Accordingly, 650 students are reached for the sample size of the research.

DATA COLLECTION TOOL AND PROCESS

In the study, A "Personal Information Form" was prepared by the researcher, consisting of questions about gender, mother's education and father's educational levels. A 38-item "English Self-Efficacy Perception Scale" prepared by the researcher was used to measure the participants' self-efficacy perceptions in English. In order to determine the academic success of the participants in English, an English test with a first and second term units was prepared by the researcher.

DATA ANALYSIS

The data obtained in the study are transferred to the computer environment and necessary analyzes are made. Before analysis, the normality of the distribution of data is examined. The sample size is greater than 50 in determining whether the data shows normal distribution or not. Therefore, the Kolmogorov-Smirnov (K-S) test is examined. The calculated p value of less than 1.96 for α=.05 is an indication that the distribution does not deviate excessively from normal. In addition, since the points appear close to 45 degrees in the Q-Q graph, the data are considered to show a normal distribution (Büyüköztürk, 2012: 40-42). Appropriate tests are applied in cases that do not comply with the normal distribution. The methods used in the analysis of the data are as follows:

1. For the first sub-problem, Pearson Product-Moment Correlation is applied to determine whether there is a significant relationship between the English self-efficacy levels of the fifth grade students in secondary school and the English course academic scores due to the normal distribution of the data and the variables are independent from each other (Köklü & Büyüköztürk, 2000: 123-124).

2. Pearson Product-Moment Correlation is applied to examine the relationships between English self-efficacy levels and academic scores of the fifth grade students in secondary school in terms of gender, mother's education and father's education levels related to the second, third and fourth sub-problems.

3. Two Way Analysis of Variance is used to determine the common effect of English self-efficacy levels and gender, mother's education and father's education levels above the fifth grade students' academic achievement scores due to the normal distribution of data on the fifth, sixth and seventh sub-problems and the independence of the variables. The Scheffe test is used to see where this

difference is found as a result of the common effect of the English academic achievement scores of the fifth grade students in secondary school regarding the fifth sub-problem and their self-efficacy level and gender (Koç & Köybasi, 2016: 2052; Olcer, 2017: 152).

FINDINGS

The scales are applied to the fifth grade students in secondary school and the data obtained are transferred to the computer, and appropriate statistical analyzes are performed. The results obtained from these statistical analyzes and their comments are mentioned in this section. Research problems are evaluated with the contribution of the tables.

1. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school?

Pearson Moment Product Correlation, which is expressed as 'r', is used to determine whether there is a significant relationship between English self-efficacy levels and academic achievements of English in the fifth grade students due to the normal distribution of their data (Act. Ghoroghi, Hassan and Baba, 2015: 55 Ary, Jacobs & Razavieh, 2010).

The relationship between English self- self-efficacy levels and academic achievement scores of the fifth grade students in secondary school is given in Table 1.

Table 1. Pearson Moment Product Correlation Test Results for the Relationship between English Self-efficacy Levels and Academic Achievement Scores

		English Self-efficacy Levels	Academic Achievement Points
Academic Achievement Points	Pearson Cor.	1	.162**
	Sig (2-tailed)		.000*
	N	650	650
English Self-efficacy Levels	Pearson Cor.	.162**	1
	Sig (2-tailed)	.000*	
	N	650	650

*p<0.05

Pearson's correlation coefficient varies between -1 and +1. Accordingly, the value of -1.00 indicates that if one variable increases, the other variable decreases; The value of +1.00 represents a strong positive relationship between variables (Ghoroghi, Hassan & Baba, 2015: 55). From this point of view, it is determined that there is a positive and low-level relationship between students' English self-efficacy levels and academic achievements ($r=0.162$, $p<0.05$). From this point of view, it can be said that as students' English self-efficacy levels increase, their academic achievement increases.

2. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth-grade students in secondary school in terms of gender?

In terms of gender, the relationship between English self-efficacy levels and academic achievement scores of the fifth-grade students in secondary school is given in Table 2.

Table 2. Pearson Moment Product Correlation Test Results for the Relationship Between Girl and Boy's English Self-efficacy Levels and Academic Achievement Scores

Gender			English Self-efficacy Levels	Academic Achievement Points
Girl	English Self-efficacy Levels	Pearson Cor.	1	.266**
		Sig (2-tailed)		.000*
		N	327	327
	Academic Achievement Points	Pearson Cor.	.266**	1
		Sig (2-tailed)	.000*	
		N	327	327
Boy	English Self-efficacy Levels	Pearson Cor.	1	.045
		Sig (2-tailed)		.423
		N	323	323
	Academic Achievement Points	Pearson Cor.	.045	1
		Sig (2-tailed)	.423	
		N	323	323

*p<0.05

When Table 2 is examined, there is a positive, low-level meaningful relationship between the English self-efficacy levels of the girls and their academic achievement in English (r_{girl}=0,266, p<05); For boys, there is no significant relationship between English self-efficacy levels and their academic achievement in English (r_{boy}=0.045, p>0.05). From this point of view, it can be said that the academic achievement of the girls with high levels of English self-efficacy level may be higher than that of the boys.

3. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of mother's educational levels?

The relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of mother's education levels is given in Table 3.

Table 3. Pearson Moment Product Correlation Test Results for the Relationship between Students' English Self-efficacy Levels and Academic Achievement Scores in Terms of Mother's Education Levels

Mother's Educational Levels			English Self-efficacy Levels	Academic Achievement Points
Illiterate	English Self-efficacy Levels	Pearson Cor.	1	.234
		Sig(2-tailed)		.261
		N	25	25
	Academic Achievement Points	Pearson Cor.	.234	1
		Sig(2-tailed)	.261	
		N	25	25
Primary school	English Self-efficacy Levels	Pearson Cor.	1	.112
		Sig(2-tailed)		.142
		N	173	173
	Academic Achievement Points	Pearson Cor.	.112	1
		Sig(2-tailed)	.142	
		N	173	173
	English Self- efficacy Levels	Pearson Cor.	1	.064
		Sig(2-tailed)		.418
		N	161	161

Secondary school	English Self-efficacy Levels	Pearson Cor.	.064	1
		Sig(2-tailed)	.418	
		N	161	161
High school	English Self-efficacy Levels	Pearson Cor.	1	.165
		Sig(2-tailed)		.055
		N	136	136
	Academic Achievement Points	Pearson Cor.	.165	1
		Sig(2-tailed)	.055	
		N	136	136
Other	English Self-efficacy Levels	Pearson Cor.	1	.191**
		Sig(2-tailed)		.017*
		N	155	155
	Academic Achievement Points	Pearson Cor	.191**	1
		Sig(2-tailed)	.017*	
		N	155	155

*p<0.05

When Table 3 is examined, a meaningful relationship has not been reached between the English self-efficacy levels and academic achievement of the children of mothers of primary and secondary school and high school graduates who are $r_{illiterate}$=,234; $r_{primary}$=,112; $r_{secondary}$=,064; $r_{highschool}$=,165, p>0.05). On the other hand; when mother's education level is university, master's etc., a positive, low-level relationship is found between the English self-efficacy levels and academic achievement of the students (r_{other} =,191, p<0.05). Accordingly, it can be said that when the education level of the mother increases, students' English self-efficacy levels and academic achievement will increase.

4. Is there a significant relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of father's educational levels?

The relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in secondary school in terms of father's educational levels is given in Table 4.

Table 4. Pearson Moment Product Correlation Test Results for the Relationship between Students' English Self-efficacy Levels and Academic Achievement Scores in Terms of Father's Educational Levels

Father's Educational Levels			English Self-efficacy Levels	Academic Achievement Points
Illiterate	English Self-efficacy Levels	Pearson Cor.	1	.319
		Sig(2-tailed)		.197
		N	18	18
	Academic Achievement Points	Pearson Cor.	.319	1
		Sig(2-tailed)	.197	
		N	18	18
Primary school	English Self-efficacy Levels	Pearson Cor.	1	.048
		Sig(2-tailed)		.629
		N	102	102
	Academic Achievement	Pearson Cor.	.048	1
		Sig(2-tailed)	.629	

	Points	N	102	102
Secondary school	English Self-efficacy Levels	Pearson Cor.	1	.070
		Sig(2-tailed)		.398
		N	149	149
	English Self-efficacy Levels	Pearson Cor.	.070	1
		Sig(2-tailed)	.398	
		N	149	149
High school	English Self-efficay Levels	Pearson Cor.	1	.239**
		Sig(2-tailed)		.003*
		N	156	156
	Academic Achievement Points	Pearson Cor.	.239**	1
		Sig(2-tailed)	.003*	
		N	156	156
Other	English Self-efficacy Levels	Pearson Cor.	1	.191**
		Sig(2-tailed)		.017*
		N	225	225
	Academic Achievement Points	Pearson Cor	.147**	1
		Sig(2-tailed)	.027*	
		N	225	225

*p<0.05

According to Table 4, there is no significant relationship between the English self-efficacy levels and academic achievement of the children whose fathers illiterate, primary and secondary school graduates ($r_{illiterate}$=,319; $r_{primary}$=,048; $r_{secondary}$=,070; p>0.05). When father's education level is high school, university, etc., a positive and low level relationship is found between English self-efficacy levels and academic achievement of students with a high level ($r_{high\ school}$=,239; r_{other}=,147, p<0.5). Based on this, if father's education level is high school, university, etc., it can be said that as students' self-efficacy levels increase, their academic achievement increases.

5. Is there a significant difference between the English academic achievement scores of the fifth grade students in secondary school according to their level of English self-efficacy and a common effect of gender?

Two Way Analysis of Variance is given in Table 5 to see if the effect of English self-efficacy level and gender on the academic achievement scores of the fifth grade students is significant.

Table 5. Descriptive Statistical Results Regarding the English Academic Achievement Scores of the 5th Grade Students in Secondary School According to Gender and English Self-efficacy Level

Gender	Low			Middle			High			Total		
	N	X	S	N	X	S	N	X	S	N	X	S
Girl	48	43.66	21.05	146	49.67	18.74	133	58.94	22.98	327	52.56	21.59
Boy	49	38.53	18.45	166	47.61	21.07	108	44.33	20.58	323	45.13	20.71
Total	97	41.07	19.84	312	48.57	20.01	241	52.39	23.07	650	48.87	21.46

When Table 5 is examined, the average of teh girls with low self-efficacy level is 43.66, the average of the girls with medium self-efficacy level is 49.67 and the average of the girls with high level English self-efficacy level is 58.94. The average of the boys with low self-efficacy level is 38.53, the average of the boys with medium self-efficacy level is 47.61 and the average of the boys with high level English

self-efficacy level is 44.33. Accordingly, as students' self-efficacy levels increase, their academic achievement in English also increases. According to the results, it can be assumed that students who have high self-efficacy level towards English lesson have high success rate in English lesson.

Table 6. Two Way Analysis of Variance (ANOVA) Results of the Usage of the English Academic Achievement Scores of the Fifth Grade Students In Secondary School According to Gender and English Self-efficacy Level

Source of Variance	Total of Squares	Sd	Average of Squares	F	P*	η2
Self-efficacy	7661.814	2	3830.907	8.923	.000	.027
Gender	6707.850	1	6707.850	15.624	.000	.024
SXG	5433.942	2	2716.971	6.328	.002	.019
Error	276497.047	644	429.343			
Total	1851744					

*p<0.05

As seen in Table 6, the common effect of gender and English self-efficacy levels on the English academic achievement of the fifth grade students in secondary school is significant (p<0.05). Hopkins (1997) states that there is a negligible relationship when the effect size value is between .00 and .10. From this point of view, the effect size value is found to be negligible (η2=0.019). Scheffe test is used to determine where gender and English self-efficacy levels are the source of significance on academic achievements in English (Koç & Köybasi, 2016: 2052; Olcer, 2017: 152). Scheffe test results are given in Table 7.

Table 7. Scheffe Analysis Results Regarding the Differences Between English Academic Achievements in Terms of Gender and English Self-efficacy Levels

English Self-Efficacy Levels and Gender	Gender and English Self-efficacy Levels	Average Difference	Sd	P
Low/ Girl	Low Boy	5.13605	4.20794	.914
	Middle Girl	-6.00547	3.44751	.695
	Middle Boy	-3.94779	3.39571	.929
	High Girl	-15.28070	3.48895	.002*
	High Boy	-.66667	359445	1.00
Low/ Boy	Low Girl	-5.13605	4.20794	.865
	Middle Girl	-11.14062	3.42094	.061
	Middle Boy	-9.08385	3.36876	.203
	High Girl	-20.41676	3.46269	.000*
	High Boy	-4.92500	5.47069	.976
Middle/ Girl	Low Girl	6.00457	3.44751	.695
	Low Boy	11.14062	3.42094	.061
	Middle Boy	2.05678	2.35098	.979
	High Girl	-9.27614	2.48372	.017*
	High Boy	5.33790	2.62985	.533
Middle/ Boy	Low Girl	3.94779	3.39574	.929
	Low Boy	9.08385	3.36876	.203
	Middle Girl	-2.05678	2.35098	.979
	High Girl	-11.33291	2.41134	.001*
	High Boy	3.28112	2.56160	.896
High/ Girl	Low Girl	15.28070	3.48895	.002*
	Low Boy	20.41676	3.46269	.000*
	Middle Girl	9.27614	2.48372	.017*

	Middle Boy	11.33291	2.41134	.001*
	High Boy	14.61404	2.68394	.000*
High/ Boy	Low Girl	.66667	3.56896	1.00
	Low Boy	5.80272	3.56896	.755
	Middle Girl	-5.23790	2.62985	.533
	Middle Boy	-3.28112	2.56160	.896
	High Girl	-14.61404	2.68394	.000*

*p<0.05

According to the results of Scheffe Test, between the girls with low level of English self-efficacy level and the girls with high level; between the boys with low level of English self-efficacy and the girls who are high; between the girls with middle level of English self-efficacy and the girls with high level; between the boys with a medium level of English self-efficacy and the girls with a high level; Among the girls with high levels of English self-efficacy and the girls with low self-efficacy and medium self-efficacy, there is a significant difference between the boys with high levels of English self-efficacy and the girls with high (p<.05). Accordingly, the girls with low levels of English self-efficacy (X=43.66) are found to be more unsuccessful than the girls with high English self-efficacy levels (X=58.94). It is determined that the boys with low self-efficacy levels (X=35.53) are more unsuccessful than the girls with high self-efficacy level (X=58.94). It is found that the girls with medium self-efficacy level (X=49.67) are more unsuccessful than teh girls with high self-efficacy level (X=58.94). It is determined that the boys with middle level of self-efficacy levels (X=47.61) are more unsuccessful than the girls with high self-efficacy levels (X=58.94). The girls with high levels of English self-efficacy (X=58.94) have low self-efficacy in English (X=43.66), the girls with middle (X=49.67) and the boys with low self-efficacy (X=38.53), middle (X=47.61) and higher (X=44.33) are found to be more successful.

6. Is there a significant difference between the English academic achievement scores of the fifth grade students in secondary school according to a common effect of English self-efficacy levels and mother's education levels?

Two way variance analysis is given in Table 8 to see if the common effect of English self-efficacy levels and mother's education levels above the English academic achievement scores of the fifth grade students is significant.

Table 8a. Descriptive Statistical Results Regarding the English Academic Achievement Scores of the Fifth Grade Students According to Mother's Education Levels and English Self-efficacy Level

Mother's Educational Levels	Low			Middle			High			Total		
	N	X	S	N	X	S	N	X	S	N	X	S
İlliterate	6	34.66	10.63	13	34.76	13.40	6	48.66	13.48	25	38.08	13.71
Primary School	47	37.87	15.14	88	44.36	19.96	38	44.00	21.90	173	42.52	19.34
Secondary School	14	37.71	18.74	73	42.73	16.99	74	47.02	25.38	161	44.27	21.46
High School	14	55.71	27.05	60	52.86	18.61	74	57.29	19.73	136	55.17	20.06
Other	16	43.00	24.02	78	57.79	20.45	62	59.54	21.93	155	56.95	21.81
Total	97	41.07	19.84	312	48.57	20.01	241	52.39	23.07	650	48.87	21.46

Table 8b. Two Way Analysis of Variance (ANOVA) Results of the Use of the English Academic Achievement Scores of the Fifth Grade Students According to Mother's Education Levels and English Self-efficacy Level

Source of Variance	Total of Squares	sd	Average of Squares	F	P*
Self-efficacy	3705.956	2	1852.978	4.483	.012

Mother's education	16838.907	4	4209.727	10.184	.000
S*M	2803.057	8	350.382	.848	.561
Error	262493.860	635	413.376		
Total	1851744				

*p<0.05

As it can be seen in Table 8b, the common effect of mother education level and English self-efficacy levels on the fifth grade students' academic achievement is not significant (p> 0.05).

7. Is there a significant difference between the English academic achievement scores of the fifth grade students in secondary school according to a common effect of English self-efficacy levels and father's education levels?

Two Way Analysis of Variance is given in Table 9 to see if the common effect of the English self-efficacy levels and father's educational levels above the English academic achievement scores of the fifth grade students is significant.

Table 9a. Descriptive Statistical Results Regarding the English Academic Achievement Scores of the Fifth Grade Students According to Father's Education Levels and English Self-efficacy Level

Father's Educational Levels	Low			Middle			High			Total		
	N	X	S	N	X	S	N	X	S	N	X	S
İlliterate	3	25.33	14.04	12	43.00	20.03	3	53.33	18.90	18	41.77	20.12
Primary School	35	39.08	15.00	44	42.27	20.58	23	39.30	20.73	102	40.50	18.67
Secondary School	21	33.33	12.73	71	42.11	18.11	58	44.00	24.00	149	41.61	20.12
High School	15	45.60	20.71	81	49.87	19.48	60	55.93	21.56	156	51.79	20.59
Other	23	50.26	27.07	105	55.16	19.37	97	58.30	21.70	225	56.01	21.30
Total	97	41.07	19.84	312	48.57	20.01	241	52.39	23.07	650	48.87	21.46

Table 9b. Two Way Analysis of Variance (ANOVA) Results of the Use of the English Academic Achievement Scores of the Fifth Grade Students According to Father's Education Levels and English Self-efficacy Level

Source of Variance	Total of Squares	sd	Average of Squares	F	P*
Self-efficacy	3623.658	2	1811.829	4.360	.013
Father's Education	19986.291	4	4996.573	12.023	.000
SxF	2067.654	8	258.457	.622	.760
Error	263894.928	635	415.583		
Total	1851744				

*p<0.05

When the results of the analysis are analyzed, the common effect of students' English self-efficacy levels and their father's educational levels on their academic achievement in English is not significant (p>0.05).

DISCUSSION, CONCLUSION AND SUGGESTIONS

The aim of the study is to determine whether the self-efficacy of the fifth grade students' achievements in the English course differentiates their academic achievement and to examine the relationships between their self-efficacy and their academic achievement in English. The findings and the sub-problems of the study are grouped and discussed below in the light of the theoretical framework.

DISCUSSION AND CONCLUSION OF THE FINDINGS ABOUT THE SELF EFFICACY LEVEL OF ENGLISH AND ACADEMIC ACHIEVEMENT SCORES

Pearson Moment Product Correlation is applied to determine whether there is a significant relationship between English self-efficacy levels

and academic achievement of the fifth grade students in secondary school. Accordingly, it is determined that there is a positive and low level significant relationship between English self-efficacy levels and academic achievements ($r=0.162$, $p<0.05$). Accordingly, there is a direct proportion between students' English self-efficacy levels and academic achievement. The reason why the relationship between these two concepts is low is thought to be due to the different self-efficacy of the students who continue education in different secondary schools. In their study, Heidari, Izadi and Ahmadian (2012: 174) found that students' self-efficacy levels are related to their use of memory strategies. Accordingly, it has been determined that students with high levels of self-efficacy use their vocabulary strategies and their academic achievement in English is high. Genç, Kuluşaklı and Aydın (2016: 53) examined the relationship between foreign language students' language learning and their foreign language self-efficacy. As a result of their study, it has been shown that students' self-efficacy levels have a significant impact on the learning process and their English self-efficacy also affect their beliefs about language learning. In this study, it has been reached that students' self-efficacy should be improved. In the light of the studies on English self-efficacy levels and academic achievement scores, it has been determined that there is an increase in the academic achievement of students when they have high self-efficacy level. From this point of view, it can be said that students who have a high level of self-efficacy can use appropriate learning strategies in learning processes depending on their awareness of their own learning and accordingly they can be successful in the process.

DISCUSSION AND CONCLUSION OF COMPARING ENGLISH SELF EFFICACY AND ACADEMIC ACHIEVEMENT BY GENDER

Pearson Moment Product Correlation is used to examine the relationship between English self-efficacy levels and academic achievement of the fifth-grade students in terms of gender and it is determined that their academic achievement is high in English lesson ($r_{girl}=0,26, p<0.05$); ($r_{boy=0,04}$, $p>0.05$).

Two Way Analysis of Variance (ANOVA) is used to determine the common effect of English self-efficacy levels and genders over the English academic achievement scores. The average of the girs with low self-efficacy level is 43.66, the average of the girls is 49.67 and the average of the girls is 58.94. The average of the boys with low self-efficacy level is found as 38.53, the average of the boys with an average of 47.61, and the average of the boys with a high of 44.33. Accordingly, it is reached that students with high level of English self-efficacy are more successful in English lessons. According to the results of the analysis, it is determined that the common effect of gender and English self-efficacy levels on the academic achievement of the fifth grade students in secondary school is significant ($p<0.05$).

According to the result of Scheffe test applied to determine the source of the difference, it is observed that the girls with low English self-efficacy levels (X=43.66) are more unsuccessful than the girls with high English self-efficacy levels (X=58.94). It is determined that the boys with low self-efficacy levels (X=35.53) are more unsuccessful than the girls with high self-efficacy level (X=58.94). It is found that the girls with middle English self-efficacy levels (X=49.67) failed more than the girls with high English self-efficacy level (X=58.94). It is determined that the boys with medium self-efficacy levels (X=47.61) are more unsuccessful than the girls with high self-efficacy levels (X=58.94). the girls with high levels of English self-efficacy (X=58.94) have low self-efficacy in English (X= 3.66), students with medium (X=49.67) and low self-efficacy (X=38.53), medium (X=47.61) and higher the boys (X=44.33) are found to be more successful. The reason why English academic achievement is high the girls; it may be due to differences between the development stages of the gender. Studies in the field are examined and studies with similar results and similar results are reached. Meera and Jumana (2015: 28) found that there is no significant difference by gender in their studies in which secondary school students examined the relationship between their English self-efficacy and academic performance. Bonyadi, Nikou and Shahbaz (2012: 116) determined a significant difference in terms of gender self-efficacy and

strategy use according to the results of the study, in which they investigated the existence of a significant difference in their self-efficacy beliefs and strategy use depending on their foreign language learning strategies, their gender and their English studies based on years. Becirovic (2017: 210) determined that the boys are more unsuccessful in the process of learning English than the girls. When the studies conducted are examined, the reason for the higher academic achievement level among the girls may be that the learning skills of the girls develop faster than the boys in terms of development and learning at the age of the study. The reason for the high level of English course success in students with high level of English self-efficacy can be expressed as the students' positive attitude towards the course and their high interest in the course.

DISCUSSION AND CONCLUSION OF COMPARING ENGLISH SELF EFFICACY AND ACADEMIC ACHIEVEMENTS ACCORDING TO PARENTS' EDUCATION LEVELS

Pearson Moment Product Correlation is used to determine whether there is a relationship between English self-efficacy levels and academic achievement scores of the fifth grade students in terms of mother education levels and father education levels. According to the findings, there is no significant relationship between the English self-efficacy levels of the children of illiterate, primary, secondary and high school graduate mothers and their academic achievements ($r_{illiterate}$=,23; $r_{primary}$=,11; $r_{secondary}$=,06; $r_{highschool}$=,16, $p>0.05$); mother's education level is university, master's etc. There is a positive and low level significant relationship between the English self-efficacy level and academic achievement of students who have (r_{other}=,19, $p<0.05$). In other words, as the level of mother education increases, students' self-efficacy levels and academic achievement will increase. As a result of the analyzes made in terms of father's educational levels, there is no significant relationship between the English self-efficacy levels and academic achievement of the children of fathers who are illiterate, primary and secondary school graduates ($r_{illiterate}$=,31; $r_{primary}$=,04; $r_{secondary}$=,07; $p>0.05$); father's education level is high school, university, master's etc. There is a positive and low-level relationship between students' English self-efficacy levels and academic achievement ($r_{highschool}$=,23; r_{other}=,14, $p<0.05$). According to this result, the level of father education is high school, university, graduate, etc. It can be said that as students' self-efficacy level increases, their academic achievement will increase. The reason for this may be that parents whose education level has reached a certain level are conscious about English lessons. Parents who are aware of this consciousness; It can be said that they motivate their children against the lesson and help their children set goals in their own learning and follow their language development.

Two Way Variance Analysis (ANOVA) is applied for the common effect of English self-efficacy levels and mother and father education levels above the English academic achievement scores of the fifth grade students. Accordingly, it is found that the common effect of mother education levels and father education levels and English self-efficacy levels on the fifth grade students' academic achievement in secondary school is not significant ($p>0.05$). Based on the research results, some suggestions of English self-efficacy level related to academic achievement in English are given below:

- English self-efficacy level is determined to be related to English academic achievement. Therefore, teachers, students and parents should be informed about the level of English self-efficacy.
- In-service trainings should be provided to teachers in order to increase student motivation towards the lesson, to prepare the necessary classroom environment and to determine the appropriate techniques in developing English self-efficacy levels.
- Students are more likely to experience the sense of accomplishment during the initial phase of the topics, so students can make quizzes and increase their self-efficacy.

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THE IMPACT OF DIALOGIC TEACHING ON ACADEMIC SUCCESS AND ANXIETY REGARDING MATHEMATICS COURSES

Abstract: The In this study, the aim is to examine the impact of Dialogic Teaching on students' academic success and anxiety regarding mathematics subjects of limit and continuity, which are in the scope of 12th grade mathematics curriculum, within the sub learning domain of continuity. During the research, both qualitative and quantitative methods were employed. The sample comprises of 56 students, 27 of which were the experimental group and the other 29 were the control group. Data sources consist of a continuity sub-learning domain success scale, which was developed by the researchers; a mathematical anxiety evaluation scale, which was revised with concept cartoons; and video recording of the lectures. During the study, Dialogic Teaching was used in the experimental group, while curriculum was taught in the control group. The results of the study indicate that Dialogic Teaching was not only effective in increasing students' success in the sub learning domain of continuity, but also helpful in reducing mathematical anxiety among students. The drawn conclusion was that Dialogic teaching has improved students' ability to generate alternative solutions to a problem, form and justify theses, make evidence-based judgments. Also it was effective in enabling students to comprehend concepts more profoundly by making scientific decisions.

Keywords: Curriculum, instruction, dialogic teaching, mathematical education

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INTRODUCTION

As a product of certain thinking processes, the mathematical information, due to its nature, should be scientifically founded and should not loose its strength before its anti-thesis (Skirbekk and Gilje, 1971; Bakhtin, 2010). In this context, based on the necessity that theses should be scientifically founded, in-class applications in mathematical education should conform to the nature of mathematics and the creation stages of information (Bingölbali, Arslan and Zembat, 2016). In order to realize this, it should be ensured that during in-class applications, students can think like a scientist on problem situations and scenarios, which are structured in accordance with the curriculum, using mathematical thinking systematic and they use their skills of prediction, making assertions, justification, discussion and discussion-based problem solving, generalization and testing by making assumptions (Bingölbali et. al., 2016; Ministry of National Education of Turkey, [MEB] 2019).

It is emphasized that in mathematics course curricula, there needs to be mutually complementary relationships between computational and conceptual information types (Ministry of National Education of Turkey, [MEB] 2019). In mathematical education, conceptual and computational information complement each other and conceptual information is essential for application of computational information (Baki and Kartal, 2004; Soylu and Aydın, 2006). It can be said that the necessary conceptual information and mathematical concepts have a cumulative structure. Considering this cumulative structure, one of the most important deficiencies in mathematical education is to add new information and carry out calculations without thoroughly learning the underlying concepts (Soylu and Aydın, 2006). Doing calculations on a concept without learning it beforehand (Baki and Kartal, 2004) and moving onto learning another concept, causes low-quality learning since conceptual and computational information cannot complement one another. In order to increase learning quality, while teaching the concepts about a subject, certain methods, which enable revealing scientific arguments regarding these concepts and justification of those arguments' validity (NCTM, 1989; Ministry of National Education of Turkey, [MEB] 2019). In this context, a particular approach, which makes it possible to scientifically found and question the proposed arguments, should be used (NCTM 2000; Alexander, 2008). It can be said that Dialogic Teaching, which conforms to this approach, maps well with the nature of mathematics and the creation stages of mathematical information (NCTM, 1989; Bakhtin, 2010; Şahin, 2016).

Dialogic Teaching is a collaborative decision-making process, during which the students justify their arguments and lay a foundation for them (Toulmin, 1958; Douek, 1998; 1999). Within this process, the queries and their answers for the justification of an argument may harbor new questions in themselves. By answering these questions, the justification of the argument is complete. The comparison between justified arguments enable exchanging ideas within peers. In this sense, dialogic teaching can briefly be defined as the process of revealing ideas and it has 5 stages (Vygotsky, 1978; Wertsch, 1985; Juzwik, Nystrand, Kelly and Sherry, 2008; Bakhtin, 2010). In the scope of Dialogic Teaching, especially when making an introduction to a new subject, offering solutions to problems that are within the course-aligned scenarios, revealing solution-oriented arguments and justification of these arguments are quite effective while teaching a new concept or multiple concepts, which have preconditional relationships. Discovering numerous arguments, summary, comparison, justification and collaborative decision-making are the five stages of Dialogic Teaching (Toulmin, 1958; Vygotsky, 1978; Wertsch, 1985; Alexander, 2008; Juzwik et al., 2008; Bakhtin, 2010). It is possible to create teaching media that conform to the five stages of Dialogic Teaching during education of mathematical concepts.

Dialogic Teaching, which is being applied to different subjects, encourages students to think and take responsibility of their own learning (ouek, 1998; 1999; Alexander, 2008). By applying Dialogic Teaching's conversational strategies such as listening, asking for opinion, asking for explanation, asking for example/evidence,

diversification and reformulation of ideas, a teacher can inspire student to form arguments about a subject or concept, create justifications for these arguments and as a result make sense of that subject or concept (Vygotsky, 1978; Wertsch,1985; Alexander, 2008; Bakhtin, 2010). In addition to student-teacher interaction, conversational strategies also increase the interaction among students (Juzwik et al., 2008). The initial step in the applications of Dialogic Teaching is to reveal as many different arguments as possible that students can muster via a question about a certain subject or concept. The teacher queries the students about new ideas about these arguments, then performs investigations, which enable diversification of these ideas, and requests explanations (Kuhn, 1994; 1995). In accordance with given explanations, the students are asked to pass evidence-based judgments. The arguments are compared according to their justifications and students are enabled to reach a collaborative conclusion (Vygotsky, 1978; Wertsch,1985). It is of paramount importance that the teacher provides guidance in order to fuse the ideas together during this process. Dialogic Teaching directs students to create arguments about the subject or concept at hand, justify or, if necessary, refute those arguments and examine the validity and reliability of the acquired evidence. As a result of this, students advance to reaching a conclusion. As a consequence of Dialogic Teaching application, decision, on which students agree, can be reached (Douek, 1998; 1999; Bakhtin, 2010).

The increasing complexity of cognitive skills and thinking processes causes a feeling of helplessness and worry about mathematical learning process. And this, in turn, creates anxiety of failing mathematics courses (Richardson and Suinn, 1972; Tobias and Weissbrod, 1980). Anxiety towards mathematics courses, which can be defined as feeling helpless against mathematical operations, and experiencing worry and mental derangement (Tobias and Weissbroad, 1980), prevents desired level of success and development in the field of mathematics. Studies about mathematical education and mathematical anxiety indicate that high level of anxiety about mathematics courses impacts success (Richardson and Suinn, 1972; Betz, 1978; Thomas and Higbee, 1999) and learning processes (Rounds and Hendel, 1980; Tobias and Weissbrod, 1980; McLeod, 1988; Vinson, 2001; Sloan, Daane and Geisen, 2002; Kurbanoğlu and Takunyacı, 2012) in a negative manner. The fact that students' high levels of mathematical anxiety and their consequent low academic successes, emphasizes the importance of researches conducted in this subject.

When the compatibility of Dialogic Teaching applications to the nature of mathematics and to the process of mathematical information generation is considered, it can be said that Dialogic Teaching applications can be utilized to increase success and reduce anxiety (Richardson and Suinn 1972; Betz 1978; Tall and Vinner, 1981; NCTM, 1989; Soylu and Aydın, 2006; Bakhtin, 2010; Kutluca, 2010; Şahin, 2016). By allowing students to freely express ideas and for justifications, Dialogic Teaching applications offer a significant increase in student success (Applebee, Langer, Nystrand and Gamoran, 2003; Applebee et al., 2003; Şahin, 2016). Several facts such as the limited number of studies regarding in-class applications of Dialogic Teaching and curriculum subjects of 12th grade (Yalçınkaya and Özkan, 2012; Güneş, 2013), the most difficult subjects to learn being limit and continuity (Tall and Vinner, 1981; Baki and Kartal, 2004; Akbulut and Işık 2005; Soylu and Aydın, 2006; Özmantar, and Yeşildere, 2008), students having numerous misunderstandings about these concepts and obtaining correct results about concepts by drawing wrong justifications (Aydın and Kutluca, 2010) augment the importance of this study and its contributions to the literature. Within this context, the aim of this paper is to examine the impact of Dialogic Teaching on students' academic success and anxiety regarding mathematics subjects of limit and continuity, which are in the scope of 12th grade mathematics curriculum, within the sub learning domain of continuity.

In the experimental part of this study, the following hypotheses were tested (H_0 : null hypothesis, H_1 : experimental hypothesis):

$H_0$1: There is no statistically significant difference between the anxiety pre-test scores of the students in the experimental group and control group.

$H_0$2: There is no statistically significant difference between the academic success pretest scores of the students in the experimental group and the control group.

H_13: There is a statistically significant difference between the anxiety pre-test and post-test scores of students in the experimental group.

H_14: There is a statistically significant difference between the academic success pre-test and post-test scores of students in the experimental group.

H_05: There is no statistically significant difference between the anxiety pre-test and post-test scores of the students in the control group.

H_06: There is no statistically significant difference between the academic success pre-test and post-test scores of the students in the control group.

H_17: There is a statistically significant difference between the anxiety post-test scores of the students in the experimental group and the control group.

H_18: There is a statistically significant difference between the academic success post-test scores of the students in the experimental group and the control group.

METHODOLOGY

RESEARCH MODEL

Both qualitative and quantitative research methods were employed concurrently in the study. A pretest/post-test quasi-experimental research pattern with a control group was used. This model is used to test the cause and effect relationship between the variables, which are controlled by the researcher and helps assessing the significance of difference between the pretest and the post-test (Cresswell, 2016). In the scope of the study, in addition to the qualitative data, quantitative data (video recordings and concept cartoons) were also obtained in order to examine the impact of interference (application of Dialogic Teaching) alongside with quasi-experimental pattern.

STUDY GROUP

The study group of the research consists of 12th grade students of an Anatolian High School in Antalya, Turkey. Since the subjects of limit and continuity are concepts handled at the 12th grade level, 12th grade students were studied within the scope of the study. Students' sections were assigned to experiment and control groups in an unbiased manner. There were a total of 56 students in the sample spaces, 29 (52%) of whom were female and the remaining 27 (48%) were male. The experiment group consisted of 27 students, 14 of whom were female (52%) and 13 were male (48%), whereas the control group consisted of 29 students, 15 of whom were female (52%) and 14 were male (48%). It is evident that both experiment and control groups have similar distributions regarding gender.

DATA COLLECTION TOOLS

In this study, Continuity Sub-Learning Domain Achievement Test (CSLDAT), which was developed by the researchers and used for assessing skill level in continuity, a sub-domain of limit and continuity subjects within 12th grade mathematics course, and Revised Mathematics Anxiety Rating Scale (RMARS), which was developed by Plake and Parker (1982) and adopted to Turkish culture by Akın, Kurbanoğlu and Takunyacı (2012) and utilized for measuring the mathematics anxiety of students.

CSLDAT was developed in order to determine the success of students in the continuity sub-learning domain regarding the five critical gains. Firstly, the gains of continuity sub-learning domain within Ministry of National Education's mathematics normalcurriculum in secondary education were determined. In order to ensure the research's content validity, a table of specifications was prepared. This table of specifications consists of gains in this sub-learning domain and the cognitive level, in which these gains will be measured. Cognitive levels were constructed in alignment with Bloom taxonomy. Questions were prepared according to the relationship between the gains and the cognitive domain. A target content relation was formed by indicating which target belonged to which subject. 8 questions were prepared by the researchers for each gain. A total of 40 multiple-choice questions consisted the item pool of the study. The questions in the pool and the table of specifications were examined regarding content validity from the perspectives of assessment and evaluation, program development and mathematical education by 3 experts per field, each of which had at least Ph. D.s in their respective field. The questions and the table of specifications were revised according to the feedback and

recommendations given by the experts. Then, in order to determine the comprehensibility of the questions (with respect to clarity, simplicity and wording), a pretest form, which consisted of 40 questions, were fully applied to 30 12th grade students and their feedback were obtained. After analyzing the gathered data, the final questionnaire that included 20 questions that have the best distinctiveness and have mid-level difficulty while considering the distribution of the questions with respect to the gains. The KR20 reliability coefficient for the trial application was found to be 0.92.

The Revised Mathematics Anxiety Rating Scale (RMARS) is a 5-point Likert scale, which consists of two sub-scales such as mathematics learning anxiety scale (16 items) and mathematics evaluation anxiety scale (8 items). The points of the scale range between Never (1) and Always (5). In the adaptation study, the Cronbach alpha internal coefficients for the whole scale, the mathematics learning anxiety and the mathematics evaluation anxiety sub-scales were found to be 0.93, 0.91 and 0.88 respectively; and the corrected total item correlation was observed in the range of 0.30-0.80. As a result of Confirmatory Factor Analysis, Chi-square was found to be 533.57 (N=372, sd=242, p=0.00), RMSEA was 0.057, NFI was 0.96, CFI was 0.98, IFI was 0.98, RFI was 0.96 and SRMR was 0.053 (Akın et al., 2010).

In order to be able to examine the impact of applied interference in greater detail, to reveal in-class statements about dialogic teaching and to determine student interactions, the lectures were documented via video recordings in addition to the utilized scales. Furthermore, a concept cartoon, which was developed by Özbek and Uyumaz (2017), was employed in order to determine the student's level of comprehension regarding three fundamental conditions of continuity, and their missing and faulty information about the subject. Student responses about the concept cartoon were graded according to a rubric, an example of which is presented in Table 1.

Table 1. Concept Cartoon Example Grading

Cartoon Character	Responses of Student S5	Grading
1	I don't agree with the student in the cartoon. The graph is not continuous, which means the function is not defined at that point. It is not continuous.	Correct Remark – 1 point Justification Exists – 1 point
2	...agreed.	Correct Remark – 1 point Justification Does Not Exist – 0 point
3	...agreed. Presented the situation as a graph. In my opinion, this function is not continuous since it does not have a limit at that point.	Correct Remark – 1 point Justification Exists – 1 point
4	I definitely agree with the student. Another condition for continuity is to have equal right and left limits at that point. Since limits are not equal, it is not continuous.	Correct Remark – 1 point Justification Exists – 1 point
		Total Score: 7

DATA COLLECTION PROCESS

The syllabuses and in-class activities for both the experiment and the control group were designed by the researchers. The experiment group's syllabus and in-class activities were designed in alignment with the stages of dialogic teaching. While preparing the experiment group's syllabus, the common 5 stages of dialogic teaching (problem introduction, argument discovery, argument summary, argument comparison and decision-making) were followed while considering the gains in Ministry of National Education's lecture book and syllabus. Activities (activity-1 and activity-2), which contain scenario situations about concepts, and questions were designed by taking advantage of similar studies in the literature (Alexander, 2008; Juzwik et. al., 2008; Şahin, 2016) and conforming to fundamental sources (Ministry of National Education of Turkey, [MEB] 2019) and based on the necessity of asking questions and guiding in-class activities in dialogic teaching according to the nature of information. The scenario in Activity-1 was prepared for

demonstrating the first two stages of dialogic teaching such as problem introduction and argument discovery. Whereas, the scenario in Activity-2 was prepared towards the argument summary and argument comparison stages of dialogic teaching. In the study, teaching application and data collection were completed after a 6-week time frame. The processes, which were carried out on experiment and control group within the scope of the study, were summarized in Table 2.

Table 2. Data Collection Process

Week	Experiment Group	Control Group
1	- Pre-test Application (CSLDAT and RMARS)	- Pre-test Application (CSLDAT and RMARS)
2	- Application of syllabus based on dialogic teaching - Activity-1 application (problem introduction and argument discovery) - Video recording of the lecture	- Application of syllabus and activities based on the teaching program - Video recording of the lecture
3	- Application of syllabus based on dialogic teaching - Activity-2 application (argument summary and argument comparison) - Video recording of the lecture	- Application of syllabus and activities based on the teaching program - Video recording of the lecture
4	- Application of syllabus based on dialogic teaching - Concept Cartoon - Exercise Pages - Video recording of the lecture	- Application of syllabus and activities based on the teaching program - Concept Cartoon - Exercise Pages - Video recording of the lecture
5	- Application of syllabus based on dialogic teaching - Practice - Video recording of the lecture	- Application of syllabus and activities based on the teaching program - Practice - Video recording of the lecture
6	- Post-test Application (CSLDAT and RMARS)	- Post-test Application (CSLDAT and RMARS)

As shown in Table-2, CSLDAT and RMARS pre-tests were applied to both experiment and control groups. In the scope of the study, after dialogic teaching application (interference) to the experiment group, and the application of the teaching program to the control group, CSLDAT and RMARS post-tests were conducted concurrently.

The lectures were applied by the main writer of this study in both the experiment and the control groups. The researcher tried to assume a role, who enables discovery, self-doing and problem-solving rather than a role, who merely transmits information, discovers it and does the work itself in both study groups. In order to increase students' in-class participation, same amount of hinting,

relevant feedback and reinforcers were tried to be utilized in both groups.

In the 2nd week of the study, the application of Activitiy-2 was performed in the experiment group. Activity-1 was carried out as a big class discussion in a U-shaped seating arrangement. Since the discussion was at the beginning of the subject and the fact that students had never experienced such an application, a short briefing was given about the culture of discussion. Students were asked to freely express their responses to the questions and their corresponding justifications without any restrictions. Based on these responses, students were allowed to speak their minds until 5 different arguments were discovered. An effort was made so that students' responses included more than one justification. In order to achieve this, various conversational strategies such as listening, asking for opinion, asking for explanation, requiring example/evidence, reformulation and diversification of ideas, and different conversation tools ("tell me more", "why?", "who wants to add something?", etc.) were employed.

At the beginning of Activity-2, the 5 different arguments and their justifications, which were discovered in the big in-class discussion during Activity-1, were summarized on the blackboard by the researcher. During this summary, the researcher asked students to verify, and if necessary correct, their arguments. Then, students were tasked to write their arguments down in the activity sheet. After completing this task, students were informed that they would be attending another big in-class discussion and they were required to compare arguments during this discussion. While comparing the arguments, students were asked to think about each argument whether it sounded logical, and if the justifications for argument were strong or weak. In order to compare arguments and create their own responses, students were given enough time and made share their comparisons. The researcher utilized numerous conversational strategies such as fusing ideas, asking for ideas, asking for explanations and diversifying the ideas, and different conversation tools ("do you agree/disagree?", "why?", "who wants to add something?", "who can repeat?", etc.). When it was observed that the desired rebuttal of ideas started to emerge and the students arrived at the required decision, the comparison discussion was concluded. Writing down the arguments with their corresponding justifications during the summary, made determination and elimination of students' misconceptions easier. Since the aim was to enable students to enable students to compare each other's arguments and take advantage of numerous rebuttals, binary conclusions such as wrong/correct were absolutely avoided. Even the most problematic comparisons were kept for decision-making stage.

Upon completion of these two activities, a big group discussion was held to facilitate decision-making. The correct arguments that were discovered by the students were repeated back by the researcher and written down to the blackboard. The students were also asked to note these arguments. Feedback about the misconceptions, which were expressed by the students during the comparison stage, and roots of these misconceptions was provided. The mistakes made by the students were clearly communicated and discussions were arranged in order to enable students to make comparisons between the correct expressions and their incorrect expressions. During the comparison of student responses, a positive atmosphere was tried to be created as much as possible and it was emphasized that every single response is extremely valuable.

In the 4th week of the study, concept cartoons were applied to both experiment and control groups. Student responses were then graded and feedback was provided in order to eliminate observed misconceptions. Students' questions about the grades were discussed in the class and they were made feel that they are part of a mutual learning process. In the context of the study, the same exercise pages and practice materials were used in both experiment and control groups during 4th and 5th week.

DATA ANALYSIS

Prior to the analysis of data, which was gathered during the research, it was examined for lost data and outliers. There found to be no missing data within the data set. Participant No 48 was discovered to be an outlier and thus removed from the data set. Consequently, the normality of the test score distributions of both experiment and control group were investigated. Corresponding results are represented in Table 3.

Table 3. Tests of Normality

Score	Experiment Group			Control Group		
	Shapiro-Wilk			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Anxiety Pre-test	,951	27	,226	,973	28	,667
Anxiety Post-test	,927	27	,057	,965	28	,460
Success Pre-test	,932	27	,076	,955	28	,259
Success Post-test	,891	27	*,009*	,968	28	,517
Anxiety Pre-test_F1	,872	27	*,003*	,982	28	,900
Anxiety Post-test_F1	,786	27	*,000*	,988	28	,984
Anxiety Pre-test_F2	,941	27	,127	,894	28	*,008*
Anxiety Post-test_F2	,890	27	*,008*	,893	28	*,008*
Concept cartoon	,925	27	,052	,902	28	*,013*
Difference F1	,901	27	*,014*	,906	28	*,015*
Difference F2	,954	27	,262	,640	28	*,000*

When Table 3. is examined, it can be observed that anxiety pre-test and post-test grades and success pre-test grades were normally distributed for both groups. Therefore, parametric techniques were employed when these results were being analyzed. For other grades that are present in the table, non-parametric techniques were used.

For each grade, descriptive statistics were calculated. In order to determine the impact of dialogic teaching application on students' mathematics anxiety, two-factor variance analysis was applied to single-factor repetitive measurements, and to examine its effects on academic success (concept cartoon graded according to rubric with the success test), Wilcoxon Signed Ranks Tests and Mann Whitney U Tests was utilized.

Content analysis was used for qualitative data, which was obtained via the video recordings of the lectures, Recordings were watched twice by the researchers and time ranges, in which dialogs that are related to the 5 stages of dialogic teaching occurred most frequently, were determined. While representing the qualitative data, code "T" for teacher and codes "S1, S2, S3,…" for student were assigned. Moreover, students' concept cartoon grades were analyzed and presented in a supplementary manner to other findings.

The validity of the study was ensured with expert opinion, participant confirmation and detailed descriptive methods. The reliability was secured by confirmation and consistency investigations. In this study, in order to increase internal validity, diversification was chosen while collecting data. Additionally, description was utilized to further contribute to validity. In detailed description, as much detail as possible was tried to be retained while remaining true to the nature of raw data (Yıldırım and Şimşek, 2013). In order to increase the internal reliability of the study, findings from the video recordings were presented with direct citations.

FINDINGS

First the significance of the difference between pre-test grades of experiment and control group participants were examined. The results of the independent samples t-test is presented in Table 4.

Table 4. Difference between Pre-test Grades of Experiment and Control Group participants-1

	Group	N	Mean	Std. Deviation	t	df	Sig.
Anxiety Pre-test	Experiment	27	51,19	15,711	,894	53	,375
	Control	28	54,89	15,054			
Success Pre-test	Experiment	27	3,63	2,078	,377	53	,708
	Control	28	3,43	1,874			

When Table 4 is investigated, it can be seen that the difference between pre-test grades of experiment and control group participants was not statistically significant (p>0.05). This result indicates that the

mathematical anxiety levels and existing knowledge about the subject for students in both groups were similar. Under these circumstances, these grades were used while determining the efficacy of the experimental process.

Table 5. Difference between Pre-test Grades of Experiment and Control Group participants-2

	Group	N	Mean Rank	Sum of Ranks	U	Sig.
Mathematics Learning Anxiety Pre-Test	Experiment	27	22,39	604,50	226,500	,011
	Control	28	33,41	935,50		
	Total	55				
Mathematics Evaluation Anxiety Pre-Test	Experiment	27	21,59	583,00	205,000	,004
	Control	28	34,18	957,00		
	Total	55				

After examining Table 5, the difference between pre-test grades for the anxiety sub-dimension of experiment and control group participants were found to be statistically significant ($p < 0.05$). This finding points to the fact that the grades of experiment and control group students about mathematical anxiety sub-dimension was not similar. As a result, while testing the efficacy of the experimental process, the difference between pre-test and post-test grades were used.

The descriptive statistics about before and after measurements of mathematical anxiety for the students in the study group were depicted in Table 6.

Table 6. Descriptive Statistics

	Group	Mean	Std. Deviation	N
Anxiety Pre-test	Experiment	51,19	15,711	27
	Control	54,89	15,054	28
	Total	53,07	15,351	55
Anxiety Post-test	Experiment	47,96	14,973	27
	Control	59,61	15,140	28
	Total	53,89	16,033	55

When Table 6 was examined, a decrease in the anxiety grades of experiment group students from pre-test to post-test was observed, whereas, in the control group, an increase in the anxiety grades of the students from pre-test to post-test was spotted. In order to determine if this differentiation of grades obtained from the anxiety scale of two groups of students, one of whom was subjected to the experimental process and the other one was not, is statistically significant, in other words, gauge the efficacy the experimental process on the total grades obtained from the anxiety scale, the results of a two-factor variance analyses (Two-Way ANOVA for Mixed Measures) was used for single-factor repetitive measurements was presented in Table 7.

Table 7. The efficacy the experimental process on the total grades obtained from the anxiety scale

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Between-subjects						
Group	1619,760	1	1619,760	3,872	,054	,068
Error	22172,204	53	418,343			
Within-Subjects						
factor1	15,300	1	15,300	,340	,562	,006
factor1 * Group	432,900	1	432,900	9,631	,003	,154
Error (factor1)	2382,190	53	44,947			

When Table 7 was studied, it was seen that for both experiment and control group students, the difference in anxiety levels before and after the experiment is statistically significant. In other words, being in different process groups and taking repetitive measurements in different times exhibited a statistically significant mutual impact students' mathematical anxiety levels ($F_{(1, 53)}$= 9.631, $p<0.05$, η^2=0.154). This finding indicates that the change in mathematical anxiety from pre-test to post-test of the students, who were subjected to dialogic teaching (experiment group), was different from the students, who were in the control group. In short, mathematical anxiety of experiment and control groups differed according to the applied experimental process. Mathematical anxiety changes as a result of this application. This change in the mathematical anxiety of the students arises from the fact that dialogic teaching was used during education. As a result, using dialogic teaching instead of conventional methods during education is an important factor for decreasing mathematical anxiety of students.

The results of Mann Whitney U test, which was conducted to determine the significance of the difference between pre-test and post-test grades of mathematical learning anxiety sub-dimension and mathematical evaluation anxiety sub-dimension, were presented in Table 8.

Table 8. The significance of the difference grades

	GROUP	N	Mean Rank	Sum of Ranks	U	p
Mathematics Learning Anxiety Pre-Test	Experiment	27	16,28	439,50	61,500	,000
	Control	28	39,30	1100,50		
	Total	55				
Mathematics Evaluation Anxiety Pre-Test	Experiment	27	20,69	558,50	180,500	,000
	Control	28	35,05	981,50		
	Total	55				

When Table 8 was examined, for the students, who were subjected to dialogic teaching application (experiment group), the difference between pre-test and post-test grades of mathematical learning anxiety ($\bar{X}$=16.28) and mathematical evaluation anxiety ($\bar{X}$=20.69) was lower in a statistically significant manner than the difference between pre-test and post-test grades of mathematical learning anxiety ($\bar{X}$=39.30) and mathematical evaluation anxiety ($\bar{X}$=35.05) of the students, who were educated about the same material by using conventional techniques ($p<0.05$). These results point to the fact that dialogic teaching in mathematics courses did decrease mathematical learning anxiety and mathematical evaluation anxiety for the sub-learning field of continuity within the subject of limit and continuity.

The average values and their corresponding standard deviations of both experiment and control groups students' RMARS sub-dimension grades can be found in Table 9.

Table 9. Descriptive Statistics

Group	Factor	Pre-Test			Post-Test		
		N	$\bar{X}$	S	N	$\bar{X}$	S
Experiment	F1. Mathematics learning anxiety	27	29.74	9.13	27	25.93	7.57
	F2. Mathematics evaluation anxiety	27	21.44	8.65	27	17.44	6.33
Control	F1. Mathematics learning anxiety	28	37.32	12.41	28	41.14	12.10
	F2. Mathematics evaluation anxiety	28	28.61	8.64	28	29.32	7.96

When Table 9 was investigated, RMARS average F1 and F2 values of experiment group students decreased from beginning to the end of dialogic teaching application. Whereas, average RMARS F1 and F2 values for the control group had increased between pre-test and post-test.

It was established in Table 4 that students' existing knowledge about continuity sub-learning domain of limit and continuity subject was not

statistically significant. The descriptive statistics about students' pre and post experiment

mathematical successes can be observed in Table 10.

Table 10. Descriptive Statistics

	Group	Mean	Std. Deviation	N
Success Pre-test	Experiment	3,63	2,078	27
	Control	3,43	1,874	28
Success Post-test	Experiment	14,74	3,526	27
	Control	7,57	1,874	28

After studying Table 10, it can be seen that for both experiment and control group students' success score averages, there is an increase from pre-test to post-test. This increase is more pronounced in the experiment group. In order to determine whether this difference in improvement is statistically significant, which also means determining the effectiveness of the experiment on mathematical success, Wilcoxon Signed Ranks and Mann Whitney U tests were conducted and their results are presented in Table 11 and Table 12 respectively.

Table 11. Difference between success Pre-test and success post-test of the participants

		N	Mean Rank	Sum of Ranks	Z	Sig.
Experiment Group Post-Pre	Negative Ranks	0[b]	,00	,00	4,554	,000
	Positive Ranks	27[c]	14,00	378,00		
	Ties	0[d]				
	Total	27				
Control Group Post-Pre	Negative Ranks	0[b]	,00	,00	4,647	,000
	Positive Ranks	28[c]	14,50	406,00		
	Ties	0[d]				
	Total	28				

b. post < pre, c. post > pre, d. post = pre

When Table 11 was examined, it was observed that the difference in mathematical success between pre-test and post-test for both experiment ($Z=4.554$, $p<0.05$) and control group students ($Z=4.647$, $p<0.05$) regarding the continuity sub-domain of limit and continuity subject was indeed statistically significant. This difference is in favor of positive ranks, which means on both groups, students' post-test scores were higher than their pre-test scores.

Table 12. Difference between Post-test Grades of Experiment and Control Group participants

	GROUP	N	Mean Rank	Sum of Ranks	U	p
Mathematics success	Experiment	27	40,04	1081,00	53,000	,000
	Control	28	16,39	459,00		
	Total	55				

After investigating Table 12, experiment group students' post-test mathematical success rank average ($\bar{X}=40.04$) is higher than control group students' mathematical success rank average ($\bar{X}=16.39$) in a statistically significant manner ($U=53.000$, $p<0.05$). These results point to the fact that dialogic teaching in mathematics courses increased mathematical success of students for the sub-learning field of continuity within the subject of limit and continuity.

Within the context of the study, the arguments that student created, which were conformant to the nature of dialogic teaching, were tried to be revealed through a concept cartoon. Difference between concept cartoon grades of experiment and control group participants shown in Table 13.

Table 13. Difference between concept cartoon grades of experiment and control group participants

	Group	N	Mean Rank	Sum of Ranks	U	p
Concept cartoon	Experiment	27	38,59	1042,00	92,000	,000

	Control	28	17,79	498,00		
	Total	55				

When Table 13 was examined, experiment group students' concept cartoon grade rank average ($\bar{X}$=38.59) is higher than control group students' concept cartoon grade rank average ($\bar{X}$=17.79) in a statistically significant manner (U=92.000, p<0.05). This result is indicative of the fact that experiment group students offered more arguments and justifications than control group students and it shows the root cause for these arguments and justifications were dialogic teaching, which used as the interference.

FINDINGS RELATED TO THE STAGES OF DIALOGIC TEACHING PROCESS

In this section, all results that were obtained via video recordings of each stage of dialogic teaching were presented in an ordered structure.

RESULTS RELATED TO PROBLEM INTRODUCTION AND ARGUMENT DISCOVERY

The results related to the problem introduction and argument discovery, which are the first 2 stages of dialog teaching, are presented in Table 14.

Table 14. Summary of Problem Introduction and Argument Discovery Stages of Dialogic Teaching

In-Class Conversations	Nature of Mathematics and Theories	Conversational Strageties / Moves
...What can you say about the limit values of May and June graphs of bacteria population with respect to lake population? (T)	Developing alternate solution to the problem	Asking for explanation
Right and left limit values are different. Not for May (S3)	Offering hypotheses	-
What is you friend trying to say? Can you explain? (T)	-	Asking for explanation
Yes for May, but No for June. Because, for limit to exist, both right and left limits should be equal. It converges to the same value in June, Yes, it exists,,, (S5)	Justification	-
What do you say? Do you agree with your friend? (T)	Revealing thoughts via dialogy	Asking for opinion /Elaborate
According to the graph, if there was no disinfection, the increase would have continued but since there is a discontinuity in the graph, there is no limit. The increase was not continuous, it was discrete… (S1)	First argument/hypothesis and Justification	
So you mean if there is no limit around a point, the function is continuous at that point. OK, do you say whether since there is no limit, it is not continuous, or since it is not continuous, there is no limit? (T)	Revealing thoughts via dialogy	Reformulation / Diversifying ideas
… we said the limit exists for the month of June. Since it converges to the same value both from right and left, I say there is continuity. Because the graph has separate parts in May, there is no continuity. (S8)	Second argument/hypothesis and Justification	
...so you say there is no continuity since it's interrupted… (T)	Revealing thoughts via dialogy	Reformulation
It is important whether it is interrupted or not. Here, some are empty and some are full. When it is empty, it is undefined… (S5)	Looking for another argument	
… I hear opinions saying that if there are more interruptions, we cannot talk about continuity at that point. If you compare the limits and values for three	Revealing thoughts via dialogy	Reformulation / Diversifying ideas

In-Class Conversations	Nature of Mathematics and Theories	Conversational Strageties / Moves
points considering these ideas, what kind of relationship do limit and continuity have? (T)		
… Right and left limits are different when it noncontinuous. But, we can say there is limit where it is continuous. For others, limit exists but, since it is undefined , it is not continuous… Here, right and left limits are different, it is defined but it is noncontinuous nonetheless… (S10)	Third argument/hypothesis and Justification	
What did your friend try to say? (T)		Asking for explanation
For it to be continuous at a point, it must have a limit and it must be defined at that point. (S14)	Third argument/hypothesis	
Do you agree with this idea? (T)	Looking for another argument	
But right and left limits are different. Hence, even though it is defined at that point, it is not continuous. (S8)		
What do you think? (T)	Looking for another argument	Diversifying ideas
It makes sense to me, too. Although right and left limits are equal, when its value is different, it is noncontinuous. Therefore, right limit, left limit and the function value should be equal… (S4)	Fourth argument/hypothesis and Justification	
Any other ideas? (T)	Looking for another argument	Asking for explanation

Video: Between 13th and 34th minutes

When Table 14 was examined, it is observed that the thoughts of the students were encouraged to form justification and as a result their thoughts were drawn out in a dialogical manner by utilizing conversation moves such as asking explanation for hypotheses, diversification of ideas. This stage was finalized after students discovered 4 different arguments about the concept, which fullfilled the requirements for advancing to the next stage.

RESULTS RELATED TO ARGUMENT SUMMARY AND COMPARİSON STAGES

After identifying the problem and presenting the arguments, the experiment advances to argument summary and comparison stage. At this stage, with the help of reinforcing discussions, students were asked questions, which directed them to argument comparison. The results of Dialogic Teaching's argument summary and comparison stages were presented in Table 15.

Table 15. Summary of Dialogic Teaching's argument summary and comparison stages

In-Class Conversations	Nature of Mathematics and Theories	Conversational Strategies / Moves
… I guess there no more ideas other than these 4 so, let's write them down (T)	Fusing of ideas with teacher's scaffolding	-

In-Class Conversations	Nature of Mathematics and Theories	Conversational Strategies / Moves
1. If a function's graph is discontinued at a point, it cannot be continuous at that point 2. If the limit does not exist at a point, the function cannot be continuous at that point 3. In order for a function to be continuous at a point, its limit must exist and the function should be defined at that point 4. For continuity, right and left limits should exist, and the function should be defined at a point. And all three should be equal.		
Let's continue the discussion based on these ideas and try to reach some conditions for continuity by mathematically evaluating these situations in the light of our second activity	Evidence-based scientific reasoning	Asking for evidence-based scientific reasoning
[Students are thinking and talking among themselves]		
Now let's discuss about these ideas. Everyone can compare their ideas with others and express their opinions… (T)		Asking for opinion
My friend said, a graph is either continuous or not, however, we consider a certain point for continuity. If there is an interruption, it's not continuous. Therefore, the first argument is true. It can be discrete even the limit exists. Let's recognize that. So, if there is limit but also there is interruption, there is no continuity. I agree with the first two arguments but there are missing points. (S2)	Mutual knowledge generation of peers through comparisons	Argument comparison
Why do you think there are missing points? (T)		Asking for explanation
… we saw that if the value and the limit is not equal, there is no continuity. So, being defined is not enough. Hence, we can talk about three conditions for continuity. I say 4. That is most comprehensive one. (S9)	Argument, justification and rebuttal	Argument comparison
… we saw that limit should exists and only if it is equal to the value of the function at that point, the function is continuous. Therefore, for continuity, all three of them should be equal and in that case the most correct argument is the fourth one, right? (S5)	Argument, justification and rebuttal	Argument comparison
From a scientific point of view, the fourth argument can be accepted for continuity. We saw noncontinuous functions even they had a limit at a point… (T)	Argument, justification and rebuttal	Argument comparison

Video: Between 5th and 27th minutes

After investigation Table 15, it was seen that students exercised evidence-based reasoning and feedback about their misconceptions and root cause of these misconceptions were given to them during argument comparisons. This stage was ended when the justified argument has been discovered among compared ideas, which fullfilled the requirements of advancing to the next stage.

RESULTS RELATED TO DECISION-MAKING STAGE

The findings obtained in the last stage of Dialogic Teaching, namely decision-making, are presented in Table 16.

Table 16. Summary of Dialogic Teaching Decision-Making Stage

In-Class Conversations	Nature of Mathematics and Theories	Conversational Strategies / Moves
Then, who would want to explain the result we reached? Let's write it on the blackboard. (T)	Dialogically agreed upon results are obtained	Asking for explanation
So, in order to be continuous at a point, limit to exist is a precondition. Moreover, the function should be defined at that point. And it needs to have the same value as its limit. This is the result we all agree after discussion, correct? (S7)	Scientific decision-making	Decision
Then, let's write the conclusion we reached on the blackboard. A function, which is continuous at a point, has also a limit at that point. However, not every function having a limit, needs to be continuous. We can say that every argument helped us reaching this conclusion. Thank you. You can write down the reached conclusion. (T)	Scientific decision-making	Decision

Video: Between 3rd and 16th minutes

When Table 16. was examined, it is concluded that, conformant to the last stage of dialogic teaching application, students had reached a result, which they agreed upon.

DISCUSSION AND INTERPRETATION

In the light of findings of the study, it is concluded that dialogic teaching application has increased the academic successes of 12th grade students in the sub-learning domain of continuity. Furthermore, it was observed that the student in the experiment group, where dialogic teaching application was performed, have formed more arguments and justifications than the student in the control group. There are many studies conducted on the factors affecting the academic success of student in the field of mathematics and the efficacy of methods that were geared towards increasing academic success (Garfield and Ahlgren, 1988; Stylianides and Stylianides 2007; Özturan-Sağırlı, Kırmacı and Bulut, 2010; Cansız, 2015; Şahin, 2016). While this study shows some similarity with respective research pattern, it distinguishes itself with the application of dialogic teaching. Moreover, the results of the study is in alignment with other studies, whose subject were the effect of dialogic teaching conformant curricula on students and their academic success (Applebee et al., 2003; Juzwik et al., 2008; Güneş, S. 2013; Şahin, 2016). In this context, by showing the improving effect of the education process, which was prepared according to the five stages of dialogic teaching, on the mathematical success within the sub-learning domain of continuity, the study contributes to the literature.

From the quantitative results of the study, it can be concluded that by using the skills driven by dialogic teaching such as development alternative solutions, creating arguments, justification of those arguments, evidence-based scientific reasoning, investigation of validity and reliability of the evidence and reaching scientific decisions, students learned concepts more effectively. Furthermore, it was observed that students participated discussions more actively, created arguments that are in line with the nature of mathematics and developed several justifications for those arguments. This result is in line with the conclusion that scientific justification (argumentation) has a reinforcing effect on students' newly learned concepts (Şahin, 2016), creating a positive class atmosphere (Applebee et al., 2003) and it enables effective learning by making understanding the true nature of mathematics easier (Garfield and Ahlgren, 1988; Güneş, 2013).

It is evident that dialogic teaching application has decreased the mathematical learning anxiety and mathematical evaluation anxiety of 12th grade students in the sub-learning domain of continuity. This finding is in alignment with the results of studies, where students had high levels of mathematical anxiety (Richardson and Suinn,

1972; Tobias and Weissbrod, 1980) and these high levels of anxiety affected mathematical success and, via various teaching designs, these anxiety levels could be reduced (Klausmeier and Goodwin 1971; Richardson and Suinn 1972; Betz 1978). Within this context, by demonstrating the fact that an education process, which was designed in accordance with the five stages of dialogic teaching, could reduce mathematical anxiety, this study makes a contribution to the field.

When the qualitative findings were examined, it can be observed that with dialogic teaching, it was possible for students to developed alternative solutions to a problem, propose arguments, justify those arguments, perform evidence-based scientific reasoning and draw scientific conclusions. This helped them to understand concepts deeper, improve mathematical success and decrease their mathematical anxiety. These results are similar to the results of studies that analyzed in-class conversations regarding the fact that students deriving new arguments from conflicting ideas within a dialogic teaching based education (Reznitskaya, Anderson and Kuo, 2007; Juzwik et al., 2008; Güneş, 2013; Şahin, 2016). Moreover, these findings are in alignment with other research results, which conclude that dialogic teaching can reduce anxiety by creating a more positive and collaborative class atmosphere (Applebee et al., 2003) and by utilizing certain strategies that are geared towards problem-solving with evidence-based scientific reasoning, which makes mathematical learning an easier process (Garfield and Ahlgren, 1988; Stylianides and Stylianides, 2007).

Since this research is limited to a certain level of education and a certain subject, in order to contribute to the literature and the development of curricula, it will be beneficial to conduct similar studies on the effects of dialogic teaching if it was applied in other courses and its relationship with other factors. If teachers use this teaching application, they can overcome the pedegogical problems they face in the classroom. It is suggested that teachers should be taken into consideration in order to be more effective in the teaching process, since the creation of these concepts also provides a basis for subsequent concepts.

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EFFECT OF CONFLICT RESOLUTION PHYSCHOEDUCATION PROGRAMME ON THE SECONDARY SCHOOL SIXTH GRADE STUDENTS ATTITUDE TOWARDS VIOLENCE AND THE LEVEL OF AGGRESSION

Abstract: The purpose of this study is to examine the effect of conflict resolution physchoeducation programme on the secondary school sixth grade students' attitude towards violence and the level of aggression. In order to examine the effect of conflict resolution pyschoeducation programme on the secondary school sixth grade students' attitude towards violence and the level of aggression, quasi-experimental pattern with pre-test-post test control group was used. The study group of the research consists of 20 students. Among this group of 20 students, 10 students formed experimental group and 10 students formed control group. To choose the students to the conflict resolution pyschoeducation programme, "Aggression Scale" developed by Gültekin (2008) was applied. The Conflict Resolution Pyschoeducation Programme consisted of 8 sessions. It was applied throughout 8 weeks including 8 sessions, each lasting 40 minutes. No studies were led with the control group. In the study, "Attitudes toward Violence Inventory" which was developed by Blevins (2001) and adapted to Turkish by Balkıs, Duru and Buluş (2005) was used as data collecting tool. It was tested whether there are meaningful differences among pre-tests and post tests of Experimental and Control Groups by using Wilcoxon Signed Ranks Test. At the end of the research of conflict resolution pyschoeducation programme, no meaningful differences were observed on the aggression levels of students in the experimental group. Nevertheless, it was observed that the scores of attitude towards violence were decreased. No meaningful difference was observed on the scores of students in the control group aggression and attitude towards violence.

Keywords: Conflict resolution, aggression, attitude towards violence

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INTRODUCTION

Schools are the social environment where interpersonal interaction is highly experienced. Students are in constant contact with the individuals around them. Since the way of thinking, beliefs and values of each individual might be different from the others, to keep in contact occasionally causes conflicts (Taştan, 2010) The occurrence of interpersonal conflicts is natural and inevitable at schools where students spend certain parts of a day in the same time and place (Tümüklü, Kaçmaz, İkiz & Balcı, 2009). Students have been experiencing conflicts on the issues about whom they would sit together, which game they would play, when they would talk, when they would listen (Johnson &Johnson 1995).

Some students start school by already gaining qualifications on emotional and social skills in the family whilst some start school without gaining those skills. Ungained emotional management and social skills may cause interpersonal conflicts and disagreements in classrooms and schools (Türnüklü, 2004). Furthermore, the first period of adolescence starting in the ages 12-14, for this period being a term that attitudes of individuals exceed and their emotions turn upside down (Temel & Aksoy, 2010) experiencing interpersonal conflicts have been becoming almost inevitable in this age group. The general definitions of conflict are set up on the inconsistency among the ideas, emotions or actions of individuals and groups (Bullock & Foegen, 2002). Conflict can be defined as compelling a group or individual to prefer a certain option and the corruption of their decision making system at the end of this compelling (Taştan, 2010). Conflicts can occur when one or more individuals disagree on a subject or the needs of persons contradict eachother (Öner, 2006). Conflicts have been formed and maintained by the attitudes and reactions performed by the parties towards eachother and actualized by verbal or non-verbal communication (Folger, Poole & Stutman, 2013). When students experience case of conflict, they generally react with attitudes like using physical or verbal violence, abstaining, ignoring or self-reproach. (Schrumpf, Crawford & Bodine, 2007). The number of violence events are increasing at schools (Johnson & Johnson, 1995), educators and adults express that the number of students who are agressive, use violence and have communication problem are increasing (Schrumpf et al., 2007). On the research done by Collins, McAlleavy & Adamson (2004); 40% of students in primary school, 30% of students after primary schools express that they experience bullying, in another research done, 36 % of students on primary/ secondary levels ,26 % of students on secondary institutions suffer from physical hits and kicks have been observed (Whitney & Smith, 1993). Whensoever the literature of our country is examined, in a study conducted on the 4th and 5th grades by Kapcı (2004), 44% of the students express their mates sometimes push them, 20% express their mates kicks or slaps them from time to time, 29% of them express their mates sometimes make rude jokes on their bodies, 18% of them express that they expose their hair or ears being pulled by their mates. Durmuş & Gürgan (2005), in their study they examined the tendency of high school students towards violence and aggression, has observed mass fight incidents among various groups of students at school in violence and aggression incidents pointed out by students in 70.1 % rate, happening outside the borders of schools, concluded by students getting injured. In a study conducted by Çınkır & Kepenekçi (2003), educators have expressed that bullying is extensively used at schools and according to them students face mostly being pushed as physical bullying.

In this study conducted by Taşar (2019), at least one of the two students was found involved in the violence event. On the other hand, Kubar & Kıral (2019); on their studies, reached the conclusion that 79.5% of the students were exposed to violence and they were exposed to physical violence the most. In a study conducted in Italy, it was found that the most frequently reported form of victimization was psychological violence (77%), then physical (52%), and these forms of violence were mostly applied by peers. (Longobardi et al., 2019). Galal, Emadeldin & Mwafy (2019), on the other hand, concluded that the prevalence of bullying behavior among adolescent students in the Egyptian countryside was high.

According to the report of Turkish Grand National Assembly Research Commission, it has been stated that 22% of students studying at secondary education during 2006-2007 educational year faced physical violence, 35,5 % of them applied physical violence (TBMM Araştırma Komisyonu Raporu, 2007).

Violence prevention and conflict resolution programmes teach students alternative methods to violence while resolving their interpersonal and personal problems (Peterson & Skiba, 2000) and conflict resolution peer mediation programmes havebeen generally urged as a way to decrease violence experienced and destructive leaded conflicts at schools (Johnson & Johnson, 1996). Scrumpf et al. (2007), stated that conflict would not be positive or negative in itself, instead of that, chosen actions would convert conflict into competetion that enables to demolish the castles or to struggle that enables to grow up. If students from the school environment learn about the nature of conflict, conflict resolution reactions and strategies, they can resolve the conflicts derived from differences among them constructively (Taştan, 2010).

Violence experienced among people generally emerges because of conflicts being directed by agressive and destructive ways. Thence, the fundamental way of reducing and preventing violence is to have the students gain managing interpersonal conflicts by constructive-peaceful-restrorative methods (Tümüklü et al., 2009). Also conflict resolution education programmes reduce aggression by teaching solution of conflicts, offering concrete samples and demonstrating the children how to act (Akgun & Araz, 2014). Also researches conducted demonstrate that conflict resolution education programme raises the students' conflict resolution skills (Ateş, 2014; Çavuş-Kasik, 2012), is effective to gain on constructive conflict resolution skills (Akgun & Araz, 2014; Uysal, 2006) and increases positive conflict resolution skills (Akça, Korkmaz & Alkal, 2018; Taştan, 2004). On a study conducted on 6-year-old-children studying at preschool education institutions, Conflict Resolution and Mediation education has been observed as effective on decreasing destructive attitudes, increasing constructive attitudes (Koruklu & Yılmaz, 2010). Also, a meaningful decrease on the aggression scores of students who have taken creative drama based conflict resolution education programmes (Gündoğdu, 2009), similarly, conflict resolution education programmes are effective on decreasing the tendency of agressive behaviours on conflict resolutions that students come across (Uysal,2006) Also an experimental study conducted by Akgun & Araz (2014), showed that the conflict resolution education programme decreases the reactive and proactive aggression levels of students. A study conducted by Cunningham et al. (1998) demonstrates that the student mediation programme decreases physically agressive play ground attitude from 51% to 65% rate.

Grossman, Neckerman, Koepsell, Liu & Rivara (1997), on their studies, expressed that violence prevention programme providing a moderately observed reduction on physically agressive attitude. Also in a study, in which researches the effects of againist violence education programme on conflict methods, violence tendency and violent behaviours of students, it was found that getting this education forms a positive effect on conflict resolution skills and reduces the violence tendency of students, however not makes a meaninful difference on violence behavior scores (Uysal & Temel, 2006; as cited in Akgün & Araz, 2010).

Conflicts occur at schools in becoming constructive conflict resolution and that enable growing via physchoeducation programmes, it is thought to be useful in creating a more peaceful school environment. This study matters importance to reduce the violence tendecies and aggression levels of the sixth grade students, resolve their conflicts by using constructive conflict resolution methods and thus to provide contribution to the evolution of the students.

In addition to this, to prevent the aggression and violence incidents at schools, it will have important contribution as an inhibitor, protector, preventor counselling and pyshological consultation services. Ministry of Education by expressing that the number of incidents like violence, aggression, bullying have arisen, hence in order to provide the students to continue their schools in a safe enviroment and to achieve the desired success from the education system, have requested pyschosocial intervention services from the pyschological counselors for the students who are exposed to

and/or enforce violence, aggression (Milli Eğitim Bakanlığı, 2006).

The results of this study composing the contents of preventive counselling and pschological counselling programmes will be prepared by pyschological counsellors, are expected to be guiding as regards to the reduction of aggression and violence at schools. In direction of this information, the purpose of this study is to examine the effects of conflict resolution pyschoeducation programme on the attitude of secondary school sixth grade students towards violence and levels of aggression.

In the direction of this information, the aim of the study is to examine the effect of conflict resolution psychoeducation program on the attitudes of middle school sixth grade students towards aggression and violence. Depending on the purpose, the following hyphothesis will be tested.

1. “Aggression” pretest and posttest difference scores significantly differ in favor of the experimental group.

2. "Attitude Toward Violence" pretest and posttest difference scores differ significantly in favor of the experimental group.

METHOD

In this study, quasi-experimental pattern with pre-test post-test with control group was used. Quasi-experimental models are important alternatives when it is not possible to carry on real experiments (Karasar, 2014). The study group of the research consists of 20 students. Among this group of 20 students; 10 students compose experiment group, 10 students compose control group. For student selection to Conflict Resolution Education Programme, Aggression Scale developed by Gültekin (2008) was applied.

Before starting the research, Agreession scale was applied on experiment and control groups. Following that, while giving 10 sessions of Conflict Resolution Skills Education to the experiment group, no procedure was applied to the control group. At the end of the education programme Aggression Scale and Attitudes Toward Violence Inventory were applied on experiment and control groups

STUDY GROUP

This study was carried in a secondary school in Konya in 2017-2018 education in academic year. For student selection to Conflict Resolution Education Programme, aggression scale developed by Gültekin (2008) was applied. Data collection tool (Aggression Scale) was applied to 40 students. Study group of the research consisted of 20 students. From this group of 20 students, 10 students composed experiment group, 10 students composed control group.

Among the students whom scale was applied to, 20 students, especially those with the high aggression scores, were selected. Among the selected 20 students, 10 volunteer students who would continue to sessions and accept the rules of the group took part in experiment group, the rest 10 students took part in control group. All the students in the experiment group were 12-year-old 6th-grade students. Among the experiment group 8 of them were boys and 2 of them were girls, among those students in the control group 9 of them were boy sone of them one was a girl.

Table 1. The results of Mann-Whitney U Test related to Aggression Test Scores of Experiment and Control Group

	N	Mean Rank	Sum of Rank	U	P
Experiment	10	10.35	103.50	48.500	.909
Control	10	10.65	106.50		

When Table 1 is analyzed, no meaningful difference was observed among Experiment and Control (U: 48.500 p>.05) group in the results of analysis.

DATA COLLECTION TOOLS

AGGRESSION SCALE (AS):

The Aggression scale which was prepared to determine the aggression levels of students was developed by Gültekin (2008). Scale consisting of 15 items comprises triple likert (always, sometimes, never) type. As a result of factor analysis applied to the scale, the common variance factor of items in the scale were observed to vary between 0.25 and 0.66. For the structural validity of the scale Confirmatory Factor Analysis (CFA) was applied. As a result of the CFA analysis, for the accordance beneficence indexes (ki-square=346,68 sd=87, p<0.01, GFI=0.95, AGFI=0.96, CFI=0.97, S-RMR=0.03 and RMSEA=0.04) were provided model-data accordance for the tested model. For the reliability practice, alpha internal consistency coefficient and re-test test method were used. The alpha internal consistency coefficient obtained over 1233 datas was found as 0.82. For the re-test test method, scale was applied to 75 persons every three weeks and Pearson Correlation Coefficient was found as 0.64. (Gültekin, 2008) In the result of exploratory factor analysis done for the structure validity of the scale, it was determined that the items were gathered in one factor and the factor loads were in an acceptable gap. As a result of the analysis, Aggression Scale can be considered as a valid and reliable measuring tool to determine the aggression levels of elemetary education second level students (Gültekin, 2008).

ATTITUDES TOWARD VIOLENCE INVENTORY (ATVI):

Attitudes toward Violence Inventory which was developed by Blevins (2001) and adapted into Turkish by Balkıs et al. (2005) is one-dimensional and consists of 11 items that describes the students' attitudes towards violence. It is a quadruple likert type (1- disagree, 4-totally agree) scale. The high scores obtained from the scale demonstrate that the attitude of the student towards violence is high. The internal consistency coefficient of the scale .737 and those total item correlations were observed varying between .39 and .53 Factor analysis was applied to test the structure analysis of the scale. As a result of the analyzes, factor loads were observed getting together on an 2.943 eigenvalue single factor that explained the 36,8% of the varience.

PROCESS

Conflict resolution pyschoeducation programme consists of 8 sessions. Programme consisting of 8 sessions was applied to the experiment group each in 40 minutes, throughout 8 weeks. No studies were conducted by the control group. Before starting to apply the education programme, Aggression Scale and Attitude Towards Violence Inventory were applied to experiment and control groups as pre-test. After completion of the education programme Aggression Scale and Attitude towards Violence Inventory were re-applied as the post-test.
As a summary, following goals and achievements were included in sessions.

1st Session: Forming the group, having knowledge related to conflict and nature of conflict, Meeting with group members, setting goals, determining the rules necessary to be followed in the group, having information about the purpose and content of the conflict resolution education program.

2nd Session: Providing students to create a general awareness through their emotions. Comprehending how emotions effect the attitudes. In conflict disagreement conditions, comprehending self emotions and other persons emotions.

3rd Session: Building effective listening and effective communication skills, providing students to comprehend the attitudes restraining active listening and emphatizing during the conflict and daily life, to help to gain the skill of listening in order to sense the emotions, to gain the ability of distinguishing emotions and events.

4th Session: Creating the consciousness about getting angry or losing one's temper is natural, however it is unacceptable to harm ourselves or others. Raising consciousness related to things would be done in anger management.

5th Session: Understanding the concept of conflict, comprehension of what conflict means in human life, perception of the results of the reactions to the conflicts, perception of the ways of conflict resolution.

6th session: Understanding Brainstorming (idea storming) method, perception of how each of the conflict resolution ways will affect the outcome of the conflict.

7th session: Understanding the steps of conflict resolution.Applying learned skills in group environment. How to slove the problems we experienced, understanding the steps of conflict resolution. Applying learned skills in group environment.
Gaining the ability to use the last 4 steps of the conflict resolution process:
1-Gaining the ability to tend towards the future and then trying to understand what happened in the past.
2-Gaining the ability to develop options
3-Gaining the ability to determine the applicable options
4-Gaining the ability to have fair deals which will satisfy both sides.

8th session: Consolidation of the problem solving skills learned. General evaluation of the conflict resolution training program application (by the chairperson and participants) and finalizing of sessions.

While creating Conflict Resolution Psychoeducation Programme gain and activities in five sources were used. (Taştan, 2010; Akgün & Araz, 2010; Türnüklü et al., 2009; Schrumpf, et al., 2007; Çoban, 2013).

DATA ANALYSIS

Because scores taken from the measurements by the samples participated in experiment and control groups for the data analysis did not have a normal distribution,non parametric analyzes were used (Bayram, 2009). In order to test whether there was a meaningful difference or not among the aggression levels of experiment and control groups, unrelated groups Mann Whitney U test was used.

Also by using Wilcoxon Signed Ranks Test, it was checked whether there was a meaningful difference in experiment and control groups or not among pre-test and post-test. The data analysis was done by SPSS 22.0 package programme.

FINDINGS

The results of Wilcoxon signed ranks test related whether the aggression levels of experiment group participants showed a meaningful difference before and after the experiment are given on Table 2.

Table 2. The Results of Wilcoxon Signed Ranks Test Pre Test Post Test of Experiment Group

Post Test- Pre Test	n	Mean Rank	Sum of Rank	z	p
Negative Row	7	5.50	38.50	-1.904	.057
Positive Row	2	3.25	6.50		
Equal	1				

The results of the analysis show that there is no meaningful difference in scores of aggression scale between experiment group participants scores before and after the experiments (z=-1.904, p>.05).

Wilcoxon Signed Ranks Test results related whether control group participants' aggression levels show a meaningful difference before and after experiment are given on Table 3.

Table 3. Wilcoxon Signed Ranks Test Results of Aggression of Control Group Pre-Test and Post Test

Post Test- Pre Test	n	Mean Rank	Sum of Rank	Z	p
Negative Row	5	5.50	27.50	-1.338	.181

Positive Row	3	2.83	8.50		
Equal	2				

The results of analysis, show that there is no meaningful difference between the aggression scale scores of control group participants before and after the experiment (z=-1.338, p>.05).

Wilcoxon Signed Ranks Test results related whether experiment group participants' levels of attitude towards violence levels show a meaningful difference before and after experiment are given on Table 4.

Table 4. The Results of Wilcoxon Signed Ranks Test on Experiment Attitude Towards Violence Pre-Test and Post Test

Post Test- Pre-Test	n	Mean Rank	Sum of Rank	z	p
Negative Row	9	5.72	51.50	-2.449	.014
Positive Row	1	3.50	3.50		
Equal	0				

The results of analysis show that there is a meaningful difference between attitude towards violence scale scores of the experiment group participants before and after the test, (z=-2.449, p<.05). When rank average and sums of the difference scores were considered, this observed difference is seen in favor of negative rows namely pre-test scores. According to this score, it can be said that Conflict Resolution Programme has an important effect on reducing the attitudes of participants towards violence.

Wilcoxon Signed Ranks Test results related whether control group participants' levels of attitude towards violence levels show a meaningful difference before and after experiment are given on Table 5.

Table 5. The results of Wilcoxon Signed Ranks Test on Control Group Attitude Towards Violence Pre test and Post Test

Post Test- Pre Test	n	Mean Rank	Sum of Rank	Z	p
Negative Row	6	5.50	33.00	-1.248	.212
Positive Row	3	4.00	12.00		
Equal	1				

The results of analysis, show that there is no meaningful difference between the aggression scale scores of control group participants before and after the experiment (z=-1.248, p>.05).

DISCUSSION AND CONCLUSION

The purpose of this study is; to examine the effect of conflict resolution physchoeducation programme on the secondary school sixth grade students' attitude towards violence and the level of aggression. As a result of this research no meaningful difference was observed on the aggression levels of the samples participated the conflict resolution pyschoeducation experimental group. However, the scores of attitude towards violence were observed to decrease. As to summarize, conflict resolution psychoeducation programme was effective on the reduction of the students' attitude towards violence. Also in a similar study parallel to our research findings, taking againist violence education programme, created a positive effect on conflict resolution skills of students, reduced the violence tendency of students, however it was found that it created no meaningful difference on violence attitude scores (Uysal & Temel, 2006; as cited in Akgün & Araz, 2010).

Additionally, it was found that negotiation (problem solving) and peer mediation training were not effective on reducing the agressive attitude of the students (Ergül, 2008), coping with violence education was not an effective method on reducing violence attitudes (Yorgun, 2007).

Ergül (2008), on his study conducted on ninth grade students, explained that negotiation (problem solving) and peer mediation training was not effective on reduction of agressive levels of students, the participants of the study experienced difficulty while controlling aggression impulse because of they were in puberty, they did not have any education from their families about controlling their aggression impulses.

When similar studies were examined, it was observed that, there was meaningful reduction on aggression scores of students who had taken creative drama-based conflict resolution education programme (Gündoğdu, 2009), conflict resolution programme was effective on reduction of tendency of applying agressor attitudes while resolving conflicts (Uysal, 2006) and it reduced the reactive and proactive aggression levels of the students (Akgun & Araz, 2014). Rossman et al. (1997) expressed on their studies that violence prevention programme provided a moderately observed reduction on physically agressive attitudes. Based on this information, there were various findings towards whether it is effective or not on reduction of agressive behaviours of students.

In our study, although conflict resolution pyschoeducation programme formed from 8 sessions were not effective on the agressive attitudes of the students,it provided a reduction on their attitude towards violence. By reason of the participants of the study are in the first period of adolescence (12-14-year-old) and these ages being the times individuals exaggrated on behaviors, when emotions being turned upside down (Temel & Aksoy, 2010), it is thought that longer trainings would be effective.

Furthermore, for the families also on the behalf of exposing example behaviours towards children on the conflicts experienced at home, it is thought that giving parenting education regarding conflict resolution would create positive impacts. When it is examined from this point of view, more effective results can be maintained by expanding the content of pyschoeducation programme consisting of 8 sessions, increasing the number of sessions and also adding peer mediation. Additionally, by giving conflict resolution education both students and their families in paralel in future work, results can be examined.

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TEACHER ADAPTATION OF CHILD DEVELOPMENT ASSESSMENT SCALE (CDAS) INTO TURKISH AND EVALUATION OF DEVELOPMENT OF 5 -YEARS-OLD CHILDREN

Abstract: This study was conducted to examine the adaptation of the Child Developmental Assessment Scale (CDAS) to Turkish and the developmental evaluations of 5-year-old children in terms of several variables. A survey model was used in the study. The study group of this research is composed of children aged 5-year-old who Attend independent public kindergartens of the Ministry of National Education in the county center of Bilecik and private nursery and day care homes. As a data collection tools in the research, the General Information Form was developed by the researcher and the CDAS which had been developed (2014) by Andrée Pomerleau, Nathalie Vézina, Jacques Moreau, Gérard Malcuit and Renée Seguin which was adapted to Turkish were used. For the linguistic equivalence of the scale, translations were first made in Turkish. The necessary statistical analyses were applied after the translation procedures and implementation. For the reliability studies of the scale, internal consistency coefficient Kuder Richardson and item total correlation analysis were applied. For the validity studies, the feedbacks of the expert academicians were analyzed by Kappa analysis and the validity of the contents was examined and the item strength and discriminative power of each item in the measure were calculated. The Kuder Richardson score for the reliability of the CDAS was found to be 0.79 for the groups scales applied. The high KR-20 values in the applications showed that the internal consistency of the test was high. With reference to the expert opinion, the validity of content and linguistic equivalence studies were found to be sufficient. These results suggest that the Child Development Assessment Scale is valid and reliable for children aged 5 years.

Keywords: Cognitive development, language development, motor development, social development, emotional development, pre-school.

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INTRODUCTION

Development is a future-oriented process of change of the organism from the fertilization to the death having physical, cognitive, language, social-emotional conditions and stages (Senemoğlu, 2012, 2). An individual's development takes place through the growth, maturation and learning processes. The development for of children is not at the same speed. Different areas of development accelerate or slow down at different times. Development also shows continuity (Cirhinlioğlu, 2015, 6). The individual can reach his/her level of potential development when the effect of the environment is added to his/her genetic heritage. If a person actively chooses the things that will bring one's life to the best point from his/her environment, one can create a unique developmental trajectory (Santrock, 2009, 20). It is the environment that will shape the inherited developmental characteristics of the child. If the child is not provided with sufficient learning opportunities by his/her environment, the child will not be able to demonstrate the expected level of developmental characteristics. It is therefore the task of parents, teachers or adults who interact with the child to contribute to the child's development. Pre-school opportunities are very important for children to adapt to society, to become independent individuals, to express themselves in the best way and to be both physically and mentally healthy. Pre-school education offers various enhanced experiences to children during the years when the development of their intelligence is the fastest and supports the development of children and improves the functions of the brain. In addition, it affects children's personality, creativity, self-perception, effective communication skills, social and emotional harmony by influencing cognitive, language, psycho-motor, social and emotional development in every field of life. The process of contributing to all these developments allows the child to start living a positive life and to maintain the positive effect of pre-school education throughout his/her life (Turaşlı, 2010, 10). In order to achieve this, it is necessary to know the developmental characteristics of childhood and to prepare educational programs suitable for their developmental characteristics. In order to overcome the disadvantages of children growing up in disadvantaged environments, the implementation of early guidance programs is of great importance. Children's developmental levels may not reach the expected point if early guidance programs are not implemented, as they may not be able to gain noteworthy experience on time. Pre-school period is of critical importance for building up all the developmental areas of children. Preschool teachers should take the necessary measures to enhance the children's way of living in disadvantaged environmental conditions in their educational-instructional environments by considering genetic and environmental factors that play a role in the development of a child. In order to take the necessary measures, pre-school teachers should know cognitive, language, social and motor development of children in different developmental periods. Through early education services, it is possible to prevent or refine the problems of children with developmental shortcomings or to solve social-emotional problems and to make plans for their active participation in the pre-school period (Mahoney, 2007, 4).

The process of evaluating child development is necessary for early determination of developmental problems. The research aiming to determine the accuracy of the evaluations of kindergarten teachers and compare these evaluations with the evaluations of children's mothers has revealed that kindergarten teachers were able to accurately predict the general development level of children. At the same time, parents and teachers' evaluations of children's behavioral and developmental characteristics were found to be similar (Koch, Kastner-Koller, Deimann, Kossmeier, Koitz and Steiner, 2011, 241). Regular evaluation and monitoring of children's development ensures effective plans for children's development. If we can determine the areas in which children need contribution, we can meet these needs with the plans we will make. During the pre-school education process, it is important for educators to evaluate children's development in order to get to know the strong and weak sides of children better and to provide them with an appropriate educational environment. It seems that there are few suitable

tools for experts who want to assess child development quickly and accurately. In order to meet the needs in this area, it was considered important to carry out the adaptation of the Child Development Assessment Scale (CDAS) to Turkish, which is a fast, easy to manage, inexpensive and accessible scale for preschool teachers. The main purpose of this study is to adapt the Child Development Assessment Scale (CDAS) to Turkish and to examine the developmental assessments of 5-year-olds in terms of different variables. Research questions are below;

1. Is the Child Development Assessment Scale (CDAS) a reliable and valid measurement tool?
2. In accordance with the Adapted Child Development Assessment Scale (CDAS), does the assessment of the development of 5-year-old children significantly differ in terms of the variables within the scope of the research?

METHODS

The current study employed the survey model. This model has been designed to reveal an existing situation, to summarize the evaluation of study populations, and to develop relevant theories by evaluating the underlying causes of these characteristics (Chambers & Clark, 2012).

SAMPLE GROUP OF THE STUDY

The population of the study is comprised of 5 year-old children (not having completed their 72nd month) attending İndependent public kindergartens and crèches affiliated to the Ministry of National Education in the city of Bilecik in Turkey in 2017-2018 school year. The sampling of the study selected to conduct reliability and validity studies consists of 233 five-year old preschoolers determined through the convenience sampling method. In this method, individuals who are easy to reach, suitable for research and volunteering are selected (Gravetter & Forzano, 2012). In order to investigate the five year-old year children's development depending on different variables, data were collected from a total of 285 preschoolers.

DATA COLLECTION TOOLS

In the current study, the "Child Development Assessment Scale (CDAS)", developed by Andrée Pomerleau, Nathalie Vézina, Jacques Moreau, Gérard Malcuit and Renée Séguin in 2005 to evaluate the development of five-year olds, was adapted to Turkish by the researcher. The personal information of the children was gathered by means of a general personal information form.

GENERAL INFORMATION FORM

In the current study, a general personal information form was developed by the researcher to obtain information about the children such as date of birth, gender, number of siblings, the birth order, the employment status of the mother, mother's education level, father's education level and the length of attendance to a pre-school institution.

CHILD DEVELOPMENT ASSESSMENT SCALE

The development of this scale was initiated by Andrée Pomerleau, Nathalie Vézina, Jacques Moreau, Gérard Malcuit and Renée Séguin in Canadian Montreal University in French language in 1998 and completed in 2005, within a seven year-period. It was adapted to English language in 2014. This scale allows the assessment of children's development level. In the original reliability study of the Child Development Assessment Scale, the internal consistency (KR-20) was found to be ranging from medium (0.50) to very good (0.80) for the target age group. Moreover, for the validity study of the original form of the scale, the correlations between Bayley and Stanford-Binet scores were examined and were found to be ranging from moderate (0.40) to very good (0.40) (> 0.60) (CLIPP, 2007, 15). The adaptability study of the scale was carried out only for the age group of five-year olds.

DATA ANALYSIS

For the validity and reliability studies of the Child Development Assessment Scale (CDAS), the relationship between the scores obtained from Kuder Richardson (KR-20) coefficients and scale items and the total score of the scale were

calculated by item-total correlation. In order to determine the reliability level of the scale, KR-20 coefficient was calculated. Item difficulty index, substance discrimination and Fleiss Kappa analyses were performed. After the reliability and validity studies of the scale, the development of preschool children were analyzed in terms of different variables by T-Test, ANOVA and Scheffe statistical analyzes.

RESULTS

RELIABILITY OF THE CHILD DEVELOPMENT ASSESSMENT SCALE (CDAS)

For the reliability studies of the Child Development Assessment Scale (CDAS), Kuder Richardson (KR-20) coefficient and the correlation between the scores taken from the scale items and the total score were calculated by means of item-total correlation. In order to determine the reliability level of the scale, KR-20 coefficient was calculated. A value close to 1.00 shows that the scale has a high reliability and a value close to 0.00 shows that the scale has a low reliability (Özçelik, 2010, 122).

Table 1. Item Reliability Results of Child Development Scale (CDAS)

Results Related to the Scale		Language/Cognitive Development Sub-dimension Results	Motor Development Sub-dimension Results	Social-Emotional Sub-dimension Results
Number of Items	46	24	10	12
KR20	0.79	0.78	0.51	0.62
x̄	34.9	16.03	7.7	11.09
SS	5.09	3.7	1.69	1.33

As can be seen in Table 1, for the language/cognitive development sub-dimension of the Child Development Assessment Scale (CDAS), Kuder Richardson (KR-20) value was found to be 0.78; for the motor development sub-dimension, KR-20 was found to be 0.51; for the social-emotional sub-dimension, KR-20 value was found to be 0.62. Kehoe (1995,1) stated that for tests consisted of up to 50 items, KR-20 reliability coefficient should be higher than 0.50 and for tests consisted of more than 50 items, this value should be higher than 0.80. As the scale consists of a total of 46 items, a reliability coefficient higher than 0.50 was considered to be enough. For the general reliability of the scores of the Child Development Assessment Scale (CDAS), Kuder Richardson (KR-20) value was found to be 0.7. Thus, the scale was found to have a high reliability. In the original version of the Child Development Assessment Scale (CDAS), in the 8th item of the language/cognitive development sub-dimension, children had to recognize the coins. Considering that coins are rarely used, the item 8 in the original scale was excluded from the scale and 1 point was automatically assigned to all the children; thus, difficulty and discrimination of the item 8 were not calculated.

Table 2. Item Total Correlation Results of Child Development Rating Scale (CDAS)

Dimensions	Item Number	x̄	SS	Corrected Item Total Correlation	Cronbach α
Language/Cognitive Development	LC1	.7175	.45123	.234	.778
	LC2	.8341	.37285	.304	.773
	LC3	.8610	.34674	.421	.766
	LC4	.7309	.44447	.449	.763

	LC5	.9776	.14838	.246	.777
	LC6	.9417	.23483	.217	.777
	LC7	,7175	.45123	.535	.757
	LC9	.6816	.46690	.248	.776
	LC10	.7444	.43718	.426	.764
	LC11	.4619	.49967	.373	.768
	LC12	.4843	.50979	.419	.765
	LC13	.9462	.24526	.331	.772
	LC14	5067	.50108	.215	.780
	LC15	.3004	.45948	.323	.772
	LC16	.1525	.36028	.347	.770
	LC17	.4843	.50088	.449	.763
	LC18	.1435	.35137	.302	.773
	LC19	.9596	.19724	.215	.777
	LC20	.1570	.36457	.216	.777
	LC21	.4529	.49890	.324	.772
	LC22	.8386	.36876	.483	.762
	LC23	.9821	.13302	.208	.778
	LC24	.7175	.45123	.234	.778
Motor Development	M1	.8834	.32166	.201	.488
	M2	.9910	.09449	.129	.509
	M3	.7489	.43463	.317	.448
	M4	.8206	.38453	.185	.492
	M5	.8565	.35137	.263	.471
	M6	.5112	.50100	.286	.458
	M7	.6323	.48327	.158	.507
	M8	.6861	.46512	.303	.452
	M9	.7623	.42661	.136	.509
	M10	.8789	.32695	.189	.491
Social-Emotional Development	SE1	.9776	.14838	.446	.593
	SE2	.9283	.25865	.398	.583
	SE3	.9865	.11546	.158	.625
	SE4	.9865	.11546	.069	.633
	SE5	.9955	.06696	.106	.630
	SE6	.9955	.06696	.005	.635
	SE7	.8969	.30482	.161	.634
	SE8	.8430	.36457	.421	.573
	SE9	.8251	.38073	.549	.532
	SE10	.9552	.20742	.264	.610
	SE11	.9731	.16217	.231	.616
	SE12	.7354	.44210	.403	.585

LC: Language/Cognitive, M: Motor Development,SE: Social-Emotional

As can be seen in Table 2, while the correlation between the items in the language/cognitive sub-dimension of the Child Development Assessment Scale (CDAS) is sufficient, the correlation between some items in the motor and social-emotional development sub-dimensions was found to be low. The mean scores taken by the children for these items in the scale were found to be close to 1 and their standard deviation values tended to decrease. The reason for the low correlation between some items in the motor and social-emotional development sub-dimensions of the Child Development Assessment Scale is that these items were correctly responded by high majority of the children; that is, the variance generated by the scores taken from these items by the children is low. Özdamar (1999, 522) states that for an item to be excluded from a scale, the change occurring in the alpha coefficient and mean when this item is deleted from the scale should be examined (Tavşancıl, 2014, 33). When the items with low correlation coefficients are excluded from the scale, they will not cause any change in alpha reliability coefficient. Considering the changes to be brought about by these items in the alpha reliability coefficient of

the scale, it was decided to keep the items with low correlation coefficients in the scale. Moreover, these items were thought to measure important behaviors in the factor they refer to and when they were analyzed in terms of their contents by the experts, it was concluded that they would be included in the scale. As a result of the item analysis, the item total correlation of the items in the scale is positive and at the acceptable level in general and the reliability coefficient was found to be high. These results show that the items in the Child Development Assessment Scale measure similar behaviors and that the internal consistency of the scale is high. Thus, it can be argued that the Child Development Scale is a reliable scale for five-year old Turkish children.

VALIDITY OF THE CHILD DEVELOPMENT ASSESSMENT SCALE (CDAS)

In the current study, five stages were followed in the adaptation of the Child Development Assessment Scale (CDAS).

First Stage: The translation of the user manual and items of the Child Development Assessment Scale (CDAS) into Turkish was done by the researcher by receiving the necessary assistance. Then this translation was examined by two experts in the field of English language separately and necessary corrections were made. This translation to Turkish was then back-translated to English by an expert in the field of English language. Then these translations were evaluated by assigning scores as "Suitable (3)", "Changeable (2)" and "Unsuitable (1)" by three experts in English language. In order to test the agreement between the evaluations, Fleiss Kappa analysis was run. Kappa values were found to be 0.958 for the language/cognitive development sub-dimension, 0.979 for the motor development sub-dimension and 0.979 for the social--emotional development sub-dimension ($p<0.001$). The scale's total score Kappa value was found to be 0.945 ($p<0.001$). Thus, it can be argued that language match was ensured.

Second Stage: The original Child Development Assessment Scale (CDAS) and its Turkish version were submitted to the review of five expert academicians for their content validity and suitability for the Turkish culture. These experts are academicians having research in the field of pre-school education. The experts were asked to evaluate each item in terms of translation, comprehensibility and development as "Suitable (3)", "Changeable (2)" and "Unsuitable (1)" and to make comments on the items in the scale. In order to test the agreement between their evaluations, Fleiss Kappa analysis was conducted. Kappa values were found to be 0.949 for the language/cognitive development sub-dimension, 0.936 for the motor development sub-dimension and 0.961 for the social--emotional development sub-dimension ($p<0.001$). The total Kappa value of the scale was found to be 0.957 ($p<0.001$). In light of the feedbacks received from the experts, the necessary corrections were made. On the basis of all these findings, it can be argued that the scale has content validity.

Third Stage: The items on which the experts reached an agreement were taken to the Turkish form of the scale. The scale items on which the experts suggested some changes were examined by the researcher and the advisor academician and then necessary changes were made. As a result, the scale was ready for piloting. Piloting was conducted on a small group.

Fourth Stage: The changes made on the Child Development Assessment Scale (CDAS) on the basis of expert opinions are given below.

Language/Cognitive Development Item 1: "The child can tell the names of the items in pictures 20 and 21 (duck, hockey stick, shovel, road, bridge, suitcase).", in this item the term "hockey stick" is not much known in the Turkish culture; thus, it was replaced with the term "ball". Language/Cognitive Development Item 14: "The child can correctly tell his/her birthday and month.", as this item it was replaced with "The child can tell his/her age". Language/Cognitive Development Item 15: "The child can correctly tell the home phone number." As the use of home phones are not very common as a result of technological developments, this item was replaced with the item "The child can correctly tell one of the emergency numbers (the police, fire department, ambulance.". Motor Development Item 3: "The child can draw the same of the two letters (W, N) shown in picture 37", as the letter "W" is not in the Turkish alphabet, it was replaced with the letter "M", which is more suitable for the

Turkish culture. As a result of these changes, the final form of the Child Development Assessment Scale (CDAS) was given and it became ready to be implemented.

Fifth Stage: In order to conduct to the reliability and validity studies of the Child Development Assessment Scale (CDAS), after the required permissions were taken by the researcher, the scale was administered to the 5 year-old children included in the sampling and attending state or private kindergartens affiliated to the Ministry of National Education. The analysis results of the data obtained according to item difficulty index are presented in Table 3.

Table 3. The Results of Analysis of Child Development Evaluation Scale According to the Substance Difficulty Index

Dimensions	Item Number	Difficulty
Language/Cognitive Development	LC1	0.5
	LC2	0.6
	LC3	0.6
	LC4	0.5
	LC5	0.7
	LC6	0.6
	LC7	0.5
	LC9	0.6
	LC10	0.4
	LC11	0.5
	LC12	0.3
	LC13	0.3
	LC14	0.6
	LC15	0.3
	LC16	0.2
	LC17	0.16
	LC18	0.3
	LC19	0.19
	LC20	0.7
	LC21	0.18
	LC22	0.3
	LC23	0.6
	LC24	0.7
Motor Development	M1	0.6
	M2	0.7
	M3	0.5
	M4	0.5
	M5	0.6
	M6	0.3
	M7	0.4
	M8	0.4
	M9	0.5
	M10	0.6
Social-Emotional Development	SE1	0.7
	SE2	0.6
	SE3	0.7
	SE4	0.7
	SE5	0.7
	SE6	0.7
	SE7	0.6
	SE8	0.6
	SE9	0.6

	SE10	0.7
	SE11	0,7
	SE12	0.5
	Grand Average	0.50

LC: Language/Cognitive, M: Motor Development,SE: Social-Emotional

Item difficulty values ranging between 0.15 and 0.85 are considered to be acceptable (Güven and Topbaş 2015, 160). When the item difficulty indexes of the Child Development Assessment Scale were examined, they were found to be ranging between 0.2 and 0.7. The general item difficulty level of the scale was found to be 0.50. Thus, it can be argued that the items in the Child Development Assessment Scale are moderately difficult items. When the items of the Adapted Child Development Assessment Scale are individually examined in regard to their item difficulty levels, it is seen that the scale has different difficulty levels. A scale developed to guide education is expected to have different levels of difficulty. Therefore, a scale should be consisted of very difficult, difficult, moderately difficult, easy and very easy items (Tekin, 2010, 248). At the same time, if majority of the items in a test are moderately difficult, its discrimination can be argued to be high (Haladyna, 2004, 400).

Item discrimination index can have a value ranging from -1 to +1. With an item's increasing power to discriminate, its item discrimination index is expected to converge to 1. The items with a negative item discrimination index should be excluded from the scale. The items with an item discrimination index between 0.00 and 0.20 should be included in the index after having been corrected or improved (Şeker and Alisinanoğlu, 2017, 646).

Table 4. The Results of Analysis of Child Development Evaluation Scale According to Item Discrimination Index

Dimensions	Item Number	Discrimination
Language/Cognitive Development	LC1	0.3
	LC2	0.4
	LC3	0.5
	LC4	0.6
	LC5	0.1
	LC6	0.2
	LC7	0.7
	LC9	0.3
	LC10	0.6
	LC11	0.5
	LC12	0.5
	LC13	0.4
	LC14	0.3
	LC15	0.3
	LC16	0.4
	LC17	0.4
	LC18	0.5
	LC19	0.4
	LC20	0.2
	LC21	0.3
	LC22	0.5
	LC23	0.5
	LC24	0.3
Motor Development	M1	0.3
	M2	0.2
	M3	0.6
	M4	0.4
	M5	0.4
	M6	0.6

	M7	0.5
	M8	0.6
	M9	0.4
	M10	0.4
Social-Emotional Development	SE1	0.4
	SE2	0.5
	SE3	0.1
	SE4	0.1
	SE5	0.2
	SE6	1.00
	SE7	0.4
	SE8	0.6
	SE9	0.7
	SE10	0.3
	SE11	0,4
	SE12	0.7
	Grand Average	0.41

LC: Language/Cognitive, M: Motor Development,SE: Social-Emotional

When the item discrimination indexes of the Child Development Assessment Scale in the current study were investigated, they were found to be varying from 0.20 to 1. Thus, it was concluded that the items in the Child Development Assessment Scale are moderately discriminatory in general. The scale's general item discrimination value was found to be 0.41. No item with a negative discrimination index was detected. Three items with an item discrimination index lower than 0.20 were found. For the items with a discrimination index lower than 0.20, the expert opinions were sought and it was decided that these items could be used to evaluate children's development. In light of all these findings, the Child Development Assessment Scale can be argued to be reliable and valid.

INVESTIGATION OF THE ASSESSMENTS MADE FOR THE 5 YEAR-OLD CHILDREN'S DEVELOPMENT BY THE ADAPTED CHILD DEVELOPMENT ASSESSMENT SCALE IN RELATION TO DIFFERENT VARIABLES

Table 5. The Results of T Test Analysis According to the Gender Variable Results of 5-Year-Old Children Development

Scale	Gender	N	x̄	SS	Sd	T	P
Language/Cognitive Development	Female	140	17.07	3.681	283	3.187	.002*
	Male	145	15.73	3.454			
Motor Development	Female	140	7.69	1.725	283	.353	.725
	Male	145	7.76	1.752			
Social-Emotional Development	Female	140	11.27	1.286	283	1.069	.286
	Male	145	11.11	1.261			

*p<.05

These findings have revealed that the children's development level mean scores vary significantly by gender in the sub-dimension "language/cognitive development" [$T_{(283)}$= 3.187, p<.05], yet, do not vary significantly in the sub-dimensions "motor development" [$T_{(283)}$= .353, p>.05] and "social-emotional development" [$T_{(283)}$= 1.069, p>.05].

Table 6. The Results of One-Way Variance Analysis (ANOVA) According to the Assessments of the 5 Years Old Children's Development on the basis of the Number of Siblings Variable

Scale	Number of Siblings	n	x̄	SS	Source of Variance	Sum of Squares	Sd	Average of the Squares	F	P
Language/ Cognitive Development	1	63	16.46	3.644	Intergroup	77.112	3	25.704	2.683	.070
	2	178	16.65	3.595	In- group	3654.874	281	13.007		
	3 and more	44	15.25	3.577	Total	3731.986	284			
Motor Development	1	63	7.42	1.846	Intergroup	17.080	3	5.693	2.011	.136
	2	178	7.88	1.703	In- group	839.117	281	2.986		
	3 and more	44	7.52	1.663	Total	856.196	284			
Social-Emotional Development	1	63	11.12	1.442	Intergroup	4.289	3	1.430	1.275	.281
	2	178	11.15	1.308	In- group	456.707	281	1.625		
	3 and more	44	11.47	0.762	Total	46.996	284			

p>.05

The findings revealed that the children's level of development does not vary significantly depending on the number of siblings in the sub-dimensions of "language/cognitive development" [$F_{(3-281)}$=2.683, p>.05], "motor development" [$F_{(3-281)}$=2.011, p>.05] and "social-emotional development" [$F_{(3-281)}$=1.275, p>.05].

Table 7. The Results of One-Way Variance Analysis (ANOVA) According to the Assessments of the 5 Years Old Children's Development on the basis of the Birth Order Variable

Scale	Birth Order	n	x̄	SS	Source of Variance	Sum of Squares	Sd	Average of the Squares	F	P
Language/ Cognitive Development	1st child	140	16.59	3.762	Intergroup	62.438	3	20.813	1.667	.191
	2nd child	124	16.39	3.489	In- group	3669.548	281	13.059		
	3rd child and others	21	15.47	3.338	Total	3731.986	284			
Motor Development	1st child	140	7.41	1.815	Intergroup	63.257	3	21.086	10.889	.000*
	2nd child	124	8.23	1.530	In- group	792.939	281	2.822		
	3rd child and others	21	6.85	1.558	Total	856.196	284			
Social-Emotional Development	1st child	140	11.12	1.428	Intergroup	4.483	3	1.494	1.358	.259
	2nd child	124	11.20	1.154	In- group	456.513	281	1.625		
	3rd child and others	21	11.61	0.669	Total	460.996	284			

* p<.05

In light of these findings, it can be argued that the children's level of development does not vary significantly depending on the birth order variable in the "language/cognitive development" sub-dimension [$F_{(3-281)}$=1.667, p>.05]. The children's level of development was found to be varying significantly depending on the birth order variable in the "motor development" sub-dimension [$F_{(3-281)}$=10.889, p<.05]. No significant difference was found in the "social-emotional" sub-dimension [$F_{(3-281)}$=1.358, p>.05].

Table 8. Scheffe Test Results for Differences in the Developmental levels of 5 Years Old Children According to Birth Order Variable

Scale	N	x̄	SS	Birth Order	1st child	2nd child	3rd child and others
Motor Development	140	7.41	1.815	1st child		*	
	124	8.23	1.530	2nd child	*		*
	21	6.85	1.558	3rd child and others		*	

According to these results, the source of the significance difference found in the "motor development" sub-dimension is the difference between the first-born child and the second-born child and between the second-born child and the third-born child. When the mean score of the second-born children (x̄=8.23) is examined, it is seen that it is higher than that of the first-born children (x̄=7.41). Moreover, when the mean score of the second-born children (x̄=8.23) is examined, it is seen that it is higher than that of the third-born children (x̄=6.85).

Table 9. The Results of One-Way Variance Analysis (ANOVA) According to the Assessments of the 5 Years Old Children's Development on the basis of the Their Mother's Education Level Variable

Scale	Mother's Education Level	n	x̄	SS	Source of Variance	Sum of Squares	Sd	Average of the Squares	F	P
Language/ Cognitive Development	Elementary school	52	13.88	3.233	Intergroup	767.640	3	255.880	24.206	.000*
	Secondary school	34	15.47	3.561	In- group	2964.346	281	10.540		
	High school	97	15.98	3.453						
	University and graduate	102	18.36	2.930	Total	3731.986	284			
Motor Development	Elementary school	52	7.50	1.578	Intergroup	7.302	5	1.460	.503	.680
	Secondary school	34	7.70	1.931	In- group	848.895	279	3.043		
	High school	97	7.72	1.718						
	University and graduate	102	7.86	1.774	Total	856.196	284			
Social-Emotional Development	Elementary school	52	10.90	1.417	Intergroup	13.707	5	2.741	1.484	.219
	Secondary school	34	11.05	1.099	In- group	447.289	279	1.603		
	High school	97	11.31	1.066						
	University and graduate	102	11.27	1.274	Total	460.996	284			

*p<.05

According to these findings, there is a significant difference in the "language/cognitive" sub-dimension [$F_{(5-279)}$=24.206, p<.05]. There is no significant difference in the "motor development" sub-dimension [$F_{(5-279)}$= .503, p>.05]. Moreover, no significant difference was found in the third sub-dimension "social-emotional development" [$F_{(5-279)}$=1.484, p>.05].

Table 10. Scheffe Test Results for Differences in the Developmental levels of 5 Years Old Children According to Their Mother's Education Level Variable

Scale	N	x̄	SS	Mother's Education Level	Elementary	Secondary school	High school	University
Language/Cognitive Development	52	13.88	3.233	Elementary school			*	*
	34	15.47	3.561	Secondary school			*	
	97	15.98	3.453	High school	*			*
	102	18.30	2.935	University and graduate	*	*	*	

The results of Scheffe test have revealed that the source of the significant difference found in the "language/cognitive" sub-dimension is the difference between the children whose mothers are elementary school graduates and the children whose mothers hold a high school and undergraduate and graduate degree and the difference between the children whose mothers hold a high school degree and the children whose mothers hold an elementary school degree and a graduate degree. When the mean scores of the children whose mothers hold an undergraduate and a graduate degree (x̄=18.3) are examined, it is seen that that they are higher than those of the children whose mothers hold an elementary school degree (x̄=13.8), a middle school degree (x̄=15.4) and a high school degree (x̄=15,9).

Table 11. The Results of T Test Analysis According to 5 Year-old Children's Development on the basis of the Mother's Status of Employment Variable

Scale	Mother's Status of Employment	N	x̄	SS	Sd	T	P
Language/Cognitive Development	Not working	164	15.56	3.685	283	4.637	.000*
	Working	121	17.51	3.323			
Motor Development	Not working	164	7.60	1.663	283	1.431	.154
	Working	121	7.90	1.823			
Social-Emotional Development	Not working	164	11.10	1.243	283	1.340	.181
	Working	121	11.31	1.310			

*p<.05

These results show that there is a statistically significant difference in the "language/cognitive development" sub-dimension [$T_{(283)}$=4.637, p<.05]. No significant difference was found in the "motor development" sub-dimension [$T_{(283)}$=1.431, p>.05]. And no significant difference was also found in the "social-emotional" sub-dimension [$T_{(283)}$=1.340, p>.05]. Thus, it can be concluded that there is no difference between the motor and social-emotional development of the children whose mothers are working and that of the children whose mothers are not working; yet, in terms of "language/cognitive development", the children whose mothers are working are more advanced when compared to the children whose mothers are not working.

Table 12. The Results of One-Way Variance Analysis (ANOVA) According to the Assessments of the 5 Years Old Children's Development on the basis of the Their Father's Education Level Variable

Scale	Father's Education Level	n	x̄	SS	Source of Variance	Sum of Squares	Sd	Average of the Squares	F	P
Language/ Cognitive Development	Elementary school	26	13.07	3.285	Intergroup	623.480	3	204.202	18.395	.000*
	Secondary school	31	14.61	3.955	In- group	3108.506	281	11.101		
	High school	103	16.18	3.333						
	University and graduate	126	17.16	3.173	Total	3731.986	284			
Motor Development	Elementary school	26	7.23	1.557	Intergroup	14.149	3	4.716	1.574	.196
	Secondary school	31	8.16	1.634	In- group	842.047	281	2.997		
	High school	103	7.65	1.649						
	University and graduate	126	7.78	1.844	Total	856.196	284			
Social-Emotional Development	Elementary school	26	10.46	1.748	Intergroup	19.260	3	6.440	4.084	.007*
	Secondary school	31	11.58	0.719	In- group	441.737	281	1.572		
	High school	103	11.16	1.067						
	University and graduate	126	11.28	1.367	Total	460.996	284			

*p<.05

According to these results, there is a statistically significant difference found for the "language/cognitive development" sub-dimension [$F_{(3-281)}$=18.395, p<.05]. No significant difference was found in the "motor development" sub-dimension [$F_{(3-281)}$=1.574, p>.05]. And a significant difference was also found in the "social-emotional" sub-dimension [$F_{(3-281)}$=4.084, p<.05].

Tablo 13. Scheffe Test Results for Differences in the Developmental levels of 5 Years Old Children According to Their Father's Education Level Variable

Scale	N	x̄	SS	Father's Education Level	Primary school	Secondary school	High school	University
Language/ Cognitive Development	26	13.07	3.285	Elementary school			*	*
	31	14.61	3.955	Secondary school				*
	103	16.18	3.333	High school	*			*
	126	17.31	3.212	University and graduate	*	*	*	
Social-Emotional Development	26	10.46	1.748	Elementary school		*	*	*
	31	11.56	0.719	Secondary school	*			
	103	11.16	1.067	High school	*			
	126	11.28	1.367	University and graduate	*			

These results show that the source of the significant difference found in the "language/cognitive sub-dimension is the difference between the children whose fathers

hold an elementary school degree and the children whose fathers hold a high school, an undergraduate and a graduate degree and the difference between the children whose fathers hold a middle school degree and the children whose fathers hold an undergraduate or a graduate degree. The mean score of the children whose fathers hold an undergraduate and a graduate degree ($\bar{x}$=17.3) is examined, it is seen that it is higher than those of the children whose fathers are elementary school graduates ($\bar{x}$=13.0), middle school graduates ($\bar{x}$=14.6) and high school graduates ($\bar{x}$=16.1). The results of Scheffe test have revealed that the source of the significant found in the "social-emotional development" sub-dimension is the difference between the children whose fathers are middle school graduates and the children whose fathers are high school graduates and the difference between the children whose fathers are high school graduates and the children whose fathers are elementary school graduates. When the mean score of the children whose fathers are elementary school graduates ($\bar{x}$=10.4) is examined, it is seen that it is lower than the mean scores of the children whose fathers are middle school graduates ($\bar{x}$=11.5), high school graduates ($\bar{x}$=11.1), hold an undergraduate degree or a graduate degree ($\bar{x}$=11.2).

Table 14. The Results of One-Way Variance Analysis (ANOVA) According to the Assessments of the 5 Years Old Children's Development on the basis of the Length of Attendance to a Pre-school Institution

Scale	The Length of Attendance to a Pre-school	N	$\bar{x}$	SS	Source of Variance	Sum of Squares	Sd	Average of the Squares	F	P
Language/ Cognitive Development	1 year	98	14.91	3.746	Intergroup	421.669	2	210.834	17.961	.000*
	2 years	142	16.76	3.480	In- group	3310.317	282	11.739		
	3 years	45	18.44	2.340	Total	3731.986	284			
Motor Development	1 year	98	7.75	1.662	Intergroup	33.437	2	16.719	5.730	.004*
	2 years	142	7,47	1,757	In- group	822,759	282	2,918		
	3 years	45	8,46	1,645	Total	856,196	284			
Social-Emotional Development	1 year	98	10,87	1,318	Intergroup	15,197	2	7,599	4,807	,009*
	2 years	142	11,36	1,205	In- group	445,799	282	1,581		
	3 years	45	11,35	1,281	Total	460,996	284			

*p<.05

These results show that there is a statistically significant difference in the "language/cognitive development" sub-dimension [$F_{(2-282)}$=17.691, p<.05]. Similarly, a statistically significant difference was also found in the "motor development" sub-dimension [$F_{(2-282)}$=5.730, p<.05]. Moreover, a statistically significant difference was also found in the "social-emotional development" sub-dimension [$F_{(2-282)}$=4.807, p<.05].

Table 15. Scheffe Test Results for Differences in the Developmental levels of 5 Years Old Children According to Length of Attendance to a Pre-school Institution

Child Development Assessment Scale	*N*	$\bar{x}$	*SS*	The Length of Attendance to a Pre-school	1 year	2 years	3 years
Language/Cognitive Development	98	14.91	3.746	1 year		*	*
	142	16.76	3.480	2 years	*		*
	45	18.44	2.340	3 years	*	*	

Motor Development	98	7.75	1.662	1 year			
	142	7.47	1.757	2 years			*
	45	8.46	1.645	3 years		*	
Social-Emotional Development	98	10.87	1.318	1 year		*	
	142	11.36	1.205	2 years	*		
	45	11.35	1.281	3 years			

The source of the significant difference found in the "language/cognitive development" sub-dimension, when the mean score of the children who have been attending the pre-school institution for three years ($\bar{x}$=18.44) is examined, it is seen that it is higher than that of the children who have been attending the pre-school institution for a year ($\bar{x}$=14.91). Similarly, the mean score of the children who have been attending the pre-school institution for three years ($\bar{x}$=18.44) is higher than that of the children who have been attending the pre-school institution for two years ($\bar{x}$=16.76). The source of the significant difference found in the "motor development" sub-dimension, the mean score of the children who have been attending the pre-school institution for three years ($\bar{x}$=8.46) is higher than that of the children who have been attending the pre-school institution for two years ($\bar{x}$=7.47). The source of the significant difference found in the "social-emotional development" sub-dimension, the mean score of the children who have been attending the pre-school institution for two years ($\bar{x}$=11.36) is higher than that of the children who have been attending the pre-school institution for one year ($\bar{x}$=10.87).

DISCUSSION AND CONCLUSIONS

In the study, validity and reliability studies were made by adapting the "Child Development Assessment Scale" (CDAS) to Turkish and the developmental evaluations of 5-year-old children were examined in terms of different variables. The Kuder Richardson (KR-20) value calculated to test the reliability of the Child Development Assessment Scale (CDAS) was found to be 0.79. This high KR-20 value shows that the internal consistency of the scale is high. The expert reviews have revealed that the content and linguistic validity studies are adequate. The general item difficulty value of the scale is 0.50 and the general item discrimination value is 0.41. On the basis of these results, the Child Development Assessment Scale can be considered to be reliable and valid for five-year olds. It has been found that the five-year old children's language/cognitive development varies significantly depending on the gender variable. On the basis of the mean scores, it can be argued that the girls are more advanced in terms of language/cognitive development than the boys. It is observed that girls establish more intense communication with their environment. While the communication skills of girls are boosted by the environment and society, boys' physical development is boosted more than their communication skills. These different attitudes remove towards male and female children may affect their development in different skill areas. There is some research in this field. While Kurtulan (2015, 3) and Aslan (2009, 2) stated that children's development varies by gender, Kuday(2007, 2), Ramazan and Demir (2011, 83), Ünal-Gürocak (2007, 2) and Tokol (1996, 3) stated that children's development does not vary by gender. Given the delineations above, it seems clear that there is some research in the literature not supporting the current research. In the current study, the 5 year-old children's motor development was found to be not varying significantly depending on gender. This might be because during pre-school education, both girls and boys are provided with the same activities; thus, they engage in similar activities during their games and plays performed in similar environments. Şeker (2015, 3), Sarı (2001, 2), Ünal-Gürocak (2007, 2), Eynur (2013, 3), Tokol (1996, 3) stated that preschoolers' motor development does not vary significantly depending on gender. All these studies support the current research. As a result of the comparison of the 5 year-old children's social-emotional

development on the basis of gender, it was found that there is no significant difference between the boys' social-emotional development mean score and the girls' social-emotional development mean score. This might because of the similar attitudes demonstrated by parents towards both genders. Due to these attitudes of parents, children of both genders exhibit similar characteristics. Tokol (1996, 3), Bilek (2011, 2), Karoğlu and Ünüvar (2017, 231) and Orçan (2004, 3) did not also find a significant difference between the social development levels of male and female children. These studies reported in the literature seem to support the current research. Yet, there are some studies not supporting the findings of the current research. Kurtulan (2015, 2) Karayılmaz (2008, 2), Seven (2007, 477), DiPrete and Jennings, (2009, 12), Tatlı and Pirpir-Alakoç (2015, 429), Ekici (2015, 70) and Yılmaz (2003, 2) found a significant difference between the social development levels of the preschoolers depending on their gender.

This study shows that children's development is not affected by the number of siblings and that each child's development process is independent of their brothers and sisters. Situations such as rapid phase of social and technological developments, increasing awareness of families and increasing interest in supporting children's development replace children's learning from siblings. Families are believed to have started to offer opportunities for every child, taking into account the changing circumstances of children. It is no longer desirable to expect the child to learn and develop by being influenced by his/her siblings. Thus, the number of siblings may affect other skills but not the developmental characteristics of children. This shows the importance of the fact that developmental evaluation should be personal. Each child is different and exhibits individual differences in development. Ünal-Gürocak (2007, 2), Ramazan and Demir (2011, 83), Orçan (2004), Karayılmaz (2008, 2), Ekici (2015, 70) also reported findings concurring with the current study. It is important in the development of a child is not his/her birth order but how much time and interest is allocated to the child and the existence of adults and peers that can positively affect the child's development in their environment. The findings reported by Ramazan and Demir (2011, 83), Orçan (2004, 2), Seven (2007, 477) and Bilek (2011, 2) also support the finding of the current research. On the other hand, a significant difference was found in the "motor development" sub-dimension on the basis of the birth order variable. The findings have revealed that the second-born children are more advanced in terms of motor development. Parents may adopt more protective approaches towards their first children. Parents with protective attitudes can keep their children under control more than necessary and meet their every need and can impose many restrictions and limitations on their actions and relationships and can do many things that should be done by children on behalf of their children. Such attitudes are believed to influence the motor development of children. Sarı (2001, 2); as a result of the study conducted on six year-old children, found that the children's motor development does not vary depending on the birth order variable. Yılmaz (2003, 2) reported that there is a negative correlation between children's large muscle motor development and their birth order and that with increasing birth order, large muscle motor development of children becomes worse. With increasing level of mother's education, the quality of the time spent with the child is believed to increase as well. Moreover, mothers with higher levels of education can more carefully monitor the development stages of their children and can take the necessary precautions when needed. Mothers with higher levels of education may have more information about the developmental characteristics of their children and may create more stimulating home environments for their children. Thus, it can be seen as quite normal that the children whose mothers hold an undergraduate or a graduate degree are more advanced in the "language/cognitive development" sub-dimension than the children whose mothers are elementary, middle and high school graduates. Şahin-Çat (2009, 2), Kurtulan (2015, 2), Yılmaz (2003, 2), Aslan (2009, 3), Ünal-Gürocak (2007,2), Yaşar and Aral (2011, 201) also reported findings in their studies investigating the language and cognitive development supporting the finding of the current study. In light of all these research findings, it can be argued that with

increasing level of education, mothers use more responsive language towards their children, provide more opportunities for their children to make observations, to think, to compare and to make predictions; in this way, help their children to be more willing for learning; as a result, their children become more advanced in their development. In the current study, it was found that the children's development does not vary significantly depending on the mother's education level variable in the "motor development" and "social-emotional development" sub-dimensions. Tokol (1996, 2) and Ünal-Gürocak (2007, 2); in their study focusing on motor development, reported findings supporting the finding of the current study. Kurtulan (2015, 3), Bilek (2011, 3), Tokol (1996, 2) and Seven (2007, 477); in their studies investigating social development, found results concurring with the current research while Orçan (2004, 2) and Ekici (2015, 2) reported findings not supporting the current research.

The mean score of the children whose mothers are working is higher than that of the children whose mothers are not working. What is more important than the quantity of the time spent with the child is the quality of this time. Spending quality and effective time with the child does not only mean being with the child in the same environment but supporting the child's development in different areas by getting them engage in purposeful activities. Working mothers may spend more limited but more qualified time with their children than mothers who do not work. Ramazan and Demir (2011, 83) compared the cognitive development level scores of the children in terms of different variables and found no significant correlation between mother's status of employment and their children's cognitive development level scores. In the current study, it was also found that the children's development level scores do not vary significantly depending on the variable of the mother's status of employment in the "motor development" and "social-emotional development" sub-dimensions. Sarı (2001, 2) investigated the children's psycho-motor development and reported that there is no significant difference between the psycho-motor development of the children whose mothers are working and that of the children whose mothers are not working. Seven (2007, 477); on the other hand, reported that the children of the working mothers display fewer behavioral problems than the children of the non-working mothers and that this might be because of the fact that the children of the working mothers attend pre-school institutions. Changing living conditions lead to a changing father model. Now, it seems that fathers spend more time in interaction with their children than their fathers did with them. With increasing level of father's education, the quality of time spent with the child is expected to increase. The fathers with higher education levels are expected to be more conscious about the development of their children. The fathers with the awareness of their children's developmental characteristics are expected to support their children more in Dubow, Boxer and Huesmann (2009, 224) various development areas. Kurtulan (2015, 2), Aslan (2009, 2), Yaşar and Aral (2011, 201), Şahin-Çat (2009, 2), Ünal-Gürocak (2007, 2) and Dündar (2010, 3); in their studies focusing on cognitive and language development, reported findings concurring with the current study. Aslan (2009, 2), Tokol (1996, 3), Ekici (2015, 2), Bilek (2011, 3) and Yükçü-Bozkurt (2017, 3); in their studies investigating social-emotional development, reported findings not supporting the findings of the current study. The results of one-way variance analysis conducted to determine the correlation between the children's development level scores and father's education level have revealed that there is no significant difference in the "motor development" sub-dimension. In Tokol's study (1996, 3), the children's fine and rough motor development was evaluated in relation to different variables and no significant correlation was found between father's education level and fine and rough motor development.

Pre-school education provides many opportunities for children. It contributes to the development of children's many skills such as thinking, expressing their thoughts, acting more freely, establishing communication, belonging to a group and socialization. Attendance to a pre-school institution is of great importance for the development of a child because in such an educational environment, children learn in a more scientific, systematic and planned manner.

Moreover, the child can become more active in an educational setting. Such an educational setting allows children to acquire skills such as collaboration, sharing and interaction by enabling them to interact with their peers in an effective manner. In short, a pre-school institution helps children to be developmentally more advanced by supporting all the areas of development for the child. In their studies, Aytun-Kasuto (2005, 2), Şahin-Çat (2009, 2), Kurtulan (2015, 2), Dündar (2010, 2), Ünal-Gürocak (2007, 2), Tatlı, Alakoç-Pirpir (2015, 429), Delprato, Dunn and Zeitlyn, (2016, 28), Brooks-Gunn, (2017, 7) found that the children's development varies depending on their length of attendance to a pre-school education institution and that with increasing length of attendance to a pre-school institution, the children's development also increases more. As a result, it seems that as pre-school institutions are rich in activities and stimuli, children's development level increases with increasing time of attendance to a pre-school institution.

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EFFECTIVENESS OF A BRAIN-BASED LEARNING THEORY IN DEVELOPING MATHEMATICAL SKILLS AND SCIENTIFIC THINKING AMONG STUDENTS WITH LEARNING DISABILITIES IN OMAN

Abstract: The current research is designed to investigate the impact of a BBL theory training program on developing mathematical skills and scientific thinking of mathematic disabled students. The proposed training program works as an independent variable comprising (22) training sessions. The methodology of the proposed program is based on integration between (Caine and Cain's) principles of BBL and (Karen D. Olsen, Susas Kovalik's) principles of BCL. The dependent variables were mathematical and scientific thinking skills. The validity and reliability of both independent and dependent variables were checked and confirmed by a pilot study, the study sample was divided into two groups; a control group of 36 participants; (16 males, 20 females), and an experimental of 35 participants; (16 males, 19 females) both with an average age (13 years). The research design used quasi-experimental design. Results showed the effectiveness of the training program employed.

Keywords: Brain-based learning theory, mathematical skills, scientific thinking, mathematic disabled students.

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INTRODUCTION

Sciences of psychology, education and neuroscience have existed separately for a long time. This was obvious in Psychologists' interest in human functions and mental abilities such as learning, memorizing and thinking. Neurological and brain scientists were interested in the evolution of the brain work and its mechanism through special models. On the other hand, educators made sure to develop educational models based on psychological theories and their surrounding circumstances prevailing in each stage; hence several behavioral models which focused on teaching thinking have appeared. The most distinguishing models are: teaching thinking models, developing intelligence models and information processing models.

Learning is the natural function of the brain. The brain is instinctively provided with a range of dormant abilities such as the ability to self-correction, learning through experience by analyzing external data and the ability to create, innovate and explore patterns (Caine & Caine, 1994: 169).

The issue of brain functions and learning has been given attention of Cognitive Psychology researchers as it is correlated to the changes of age. Educational psychologist assured that the best method in enhancing students' learning process is addressing individual differences in cognitive functions with focusing on mental styles (Rothers, 1989: 413).

BBL theory,according to Jensen (2000: 45), has a number of characteristics, including:

A- It is a way of thinking about learning and working.
B- It is an understanding of the learning process, relying on the structure and function of the brain.
C- It is not an approach nor a prescription to be followed, but it encourages taking into consideration what is known about the nature of the brain in decision-making process.
D- It is an attitude of multi-systems derived from a number of systems such as: chemistry, neuroscience, psychology, and genetic engineering, and biology.
E- It is a system in itself, not an inadvance prepared design nor religious teachings.

BBL theory is a matter of learning with an activity and conciousness. In this theory, learning process takes place, if the brain is not prevented from the completion of its natural processes (Funhouse, 2001, 17).
This theory has drawn a natural, stimulating, supporting and positive method to increase the ability of learning/teaching process and this dimension depends on the learning methods that suit the structure of brain functions (Politano & Paquin, 2000, 5). This theory ensures integration between brain functions and emotions, a full stimulating environment, creating meaning and ensuring absence of threat. This theory neglects memorizing to learning for meaning, assures contextualization, learners' participation in decision making, taking responsibility, optimizing cooperative learning and applying knowledge (Duman, 2007, 35) Caine & Caine (2002) stated that the BBL theory has twelve principles that have been modified and developed several times to match continuous and modern brain research. The following are some of these principles:
A-All forms of learning use the inner body physiology.
B-The brain/ mind is sociable.
C-Searching for the context or meaning is an innate and instinctive.
D-Searching in context occurs through patterning.
E-Emotions and excitements are decisive for patterning.
D-Brain/mind works partially and holistically in concurrence.
E-Learning includes both centered and peripheral attention.

The current study uses some of the brain-based learning strategies in designing the brain-based learning theory study program. There are a number of research works that use the theory of BBL(e.g. Akyurekand Afacan 2013; Barbara 2002; Duman, 2010; Kiedinger, 2011; Seyihoglu and Kaptan 2012).

Geary (2004) found out that brain injury was the main cause of dyscalculia. In general, dyscalculia is an umbrella term used for various difficulties in learning mathematics, such as developmental dyscalculia, mathematical difficulty, learning numerical concepts difficulty, and learning numbers concept difficulty.

Scientific thinking skills such as: observation, classification, measurement, conclusion, forecasting, judging, induction, inference, data interpretation, variables control, etc. The application of these skills is one of the fundamental objectives of scientific education. When these skills are acquired by students, they help them to cope with renewable life problems. It should be noted that the advanced industrial countries' consideration of this goal in their educational programs has been a critical factor that helped them to achieve scientific and technological advancement. Oleimat, Khawaldeh and Qadri (2008), argued that scientific thinking has many features including:

1- Organized process, which goes through specific steps beginning with the purposeful note of a phenomenon, and ending with an explanation in the form of hypotheses validated by experiment.
2- Having a purposeful process with a specific and clear goal.
3- Avoiding occurring in isolation from human being , rather, it is a product of mental activity.

STATEMENT OF THE PROBLEM

What is the effectiveness of a training program based on BBL theory in the development of mathematical skills and scientific thinking of mathematic disabled students?.

PURPOSE OF THE STUDY

The aim was to examine the effect of a BBL on mathematical skills and scientific thinking of grade 10 Omani students. To further understand this process, teachers can apply this research findings to create a safe, stress-free classroom atmosphere that engages students' minds, improving their mathematical skills, and that, in turn, should help to ameliorate their scientific thinking.

HYPOTHESES OF THE STUDY

The following hypotheses were to be verified :
1- There are statistically significant differences in pre- post-test scores mean of the experimental group on a specially designed mathematical skills test.
2- There are statistically significant differences in pre- post-test scores mean of the experimental group on a specially designed scientific thinking test.
3 – There are statistically significant differences in post-test scores mean between control and experimental groups on a specially designed mathematical skills test.
4- There are statistically significant differences in post-test scores mean between control and experimental groups on a specially designed scientific thinking test.

METHODOLOGY

RESEARCH METHOD

Quasi-experimental research method was employed.

Participants: A sample of 71 students in grade 7 of basic education in the Sultanate of Oman with LD was invited to participate in the study. Those who demonstrated low achievement scores on reading comprehension test (standardized test Mourad, 2015) (i.e., at least 1.5 [SD] below their same age people(APA, 2013,P.70 ; Mourad, 2018, P.109), though their normal levels of intellectual functioning(Mourad, 2012; Mourad & Amaal, 2013; Hesham& Rasha, 2014),the absence of any neurological or motor disorders(Al Said, 2014; Mohammed, 2014, Omema, 2015) were included. The sample was randomly divided into two groups; experimental (n= 36 boys only) and control (n= 35 boys only). The two groups were matched on age, IQ, achievement, mathematical Skills, and scientific thinking.

Table 1. pretest mean scores, standard deviations, T- value, and significance level for experimental and control groups on age (by month), IQ, achievement, Mathematical Skills, and Scientific thinking.

Variable	Group	N	M	SD	T	Sig.
Age	Experimental	35	148.57	2.84	0.472	0.547
	Control	36	148.31	2.91		
IQ	Experimental	35	108.18	6.13	0.796	0.383
	Control	36	108.59	6.53		
Achievement	Experimental	35	41.13	1.87	0.613	0.393
	Control	36	41.39	1.57		
Mathematical Skills	Experimental	35	91.32	3.17	0.823	0.315
	Control	36	91.66	3.21		
Scientific thinking	Experimental	35	25.25	2.29	0.351	0.651
	Control	36	25.39	2.61		

DATA COLLECTION TOOLS

Raven matrices scale (Raven., Styles and Raven, 1998).

An academic achievement test: The end-of-year examination results of the participants in standardized and marked Math test by the teachers, and provided the summative evaluation scores for the analysis. Hence, scores in the Math test served as measures of students' achievement.

Mathematical Skills Scale: (Ersoy and Baser, 2013). It is a 5 Likert type scale that has four factors [higher order thinking tendency (6), reasoning (4), mathematical thinking ability (8) and problem solving (7)] and 25 items. Cronbach Alpha Coefficient was found to be.78.

Scientific thinking scale: Through informed researchers on a number of literature and scientific studies and tests of scientific thinking in this area, so the researchers preparing a test of scientific thinking knowledge of students' abilities and mental scientific potential. Then re-test in accordance with the following steps:

a. Identifying scientific thinking skills: After consulting specialists in the field, it has been agreed to determine (7) skills of scientific thinking, namely: (a sense of the problem, identifying the problem, the imposition of hypotheses, choice of hypotheses, conclusion, and the application).

B. Preparing paragraphs for the test: According to the literature and previous studies as Alabeygi (2005), Shayal Al alam (2009) and Alhaimed (2011), paragraphs were prepared, which, caught up with the students' characteristics of this school stage has become a test in its final form consisting (6) questions for the job.

Test Authenticity: the researchers relied on the virtual and logical honesty to extract test the authenticity and knowledge of its suitability to measure developed for him.

C. Arbitrators in the field of educational and psychological sciences and methods of teaching Mathematic and supervisor specialists for physics curriculum and teachers numbered (16) professors specializing. Researchers made proportion (80%) to be an accepted paragraph for the test. final test consisting of (38) questions and four alternatives.

D. Application of the exploratory test: The researchers applied the test on an exploratory sample of community group, (58) students in order to calculate the discriminatory paragraphs force, and the right time to answer.

RESULTS

Question 1: Are there any statistically significant differences in pre- post-test scores mean of the experimental group on a specially designed mathematical skills test? To answer this question, T test was used.

Table 2. Paired t-tests of difference between pre and post application for exp. group in mathematical skills.

Test				
	Post	pre	T	Sig.
Mathematical skills	106.51	91.32	7.59**	0 .000

Note: **P <0.01

For mathematical skills, regarding table 2, the result shows that there is a statistically mean difference for achievement (t=7.59, p < 0.01).

Question 2: Are there any statistically significant differences in pre- post-test scores mean of the experimental group on a specially designed scientific thinking test? To answer this question T-test was used.

Table 3. Paired t-tests of difference between pre and post application for experimental group in scientific thinking

Test				
	Post	pre	T	Sig.
Scientific thinking	30.19	25.57	5.86**	0 .000

Note: **P <0.01

For scientific thinking, regarding table 3, the result shows that there is a statistically mean difference for total score (t=5.86).

Question 3: Are there any statistically significant differences in post-test scores mean between control and experimental groups on a specially designed mathematical skills test? To answer this question, T test was used s.

Table 4. Independent samples t-test for the performance of both groups on the mathematical skills.

Test				
	Experimental	Control	T	Sig.
Mathematical skills	106.51	92.53	6.21*	0 .01

Note: **P <0.01

For Mathematical skills, regarding table 4, the result shows that there is a statistically mean difference for Academic achievement (t=6.21, p < 0.01).

Question 4: Are there any statistically significant differences in post-test scores mean between control and experimental groups on scientific thinking test? To answer this question T-test was used.

Table 5. Independent samples t-test for the performance of both groups in the scientific thinking

Test				
	Experimental	Control	T	Sig.
Scientific thinking	30.19	26.01	26.01	0 .01

Note: **P <0.01

For scientific thinking, regarding table 5, the result shows that there is a statistically mean difference for total score (t=5.16).

CONCLUSIONS AND DISCUSSION

There is a statistically significant difference between the mean scores of the experimental

group on the pre and post administration of the Mathematical skills test in favor of the post administration, this indicated the equality of the suggested program. There is a statistically significant difference between the mean scores of the experimental group on the pre and post administration of the scientific thinking in favor of the post administration, this indicated the equal effect of the suggested program. There is a statistically significant difference(0.01) between the mean scores of the experimental group and that of the control group of Mathematical skills test in favor of the exprerimental group. There is a statistically significant difference(0.01) between the mean scores of the experimental group and that of the control group of scientific thinking in favor of the exprerimental group. The value of Eta-Squar ($.\eta^2$) which is (.115) indicates that the program has a high effect on developing achievement, it also indicates that the program clarifies the diversity between the students'scores in the experimental group when they were compared with those of the control one. Eta-Squar ($.\eta^2$) indicated that the mean score of the expermental group occurs in (78) for the control group and this indicates that the mean score of the experimental group is higher than (78) of that of the control group scores or it indicates that the mean score of the expperimental group incudes 78% of the control group scores. The value of Eta-Squar ($.\eta^2$) which is (.239), indicates that the program has a great effect on developing the scientific thinking of the experimental group in the post test . It also indicates that the program clarifies (24.1%) of the diversity in the students'scores in the scientific thinking in the post test when they are compared with the same group scores in the pre application of the test and it is a good quantity of diversity of the program and this indicates the effectiveness of the program.

In previous research, Lewis (2014) stated that students with MLD have a different way of scientific thinking. She thought that students with MLD did not mean to have a lack of mathematical skills, but there are different ways of thinking in mathematical skills. In our finding, it can be concluded that students have different ways of thinking in understanding the operation of Mathematical skills addition. In the addition operation, students understand the common denominator approach differently, students add, not multiply the numerator by the same number with the denominator. In multiplication operations, students only perform multiplication operations on the numerator; they do not multiply the denominator.

Another finding from Lewis (2016a) concluded that adolescent students with MLD are experiencing scientific thinking, especially in scientific thinking comparison subjects, either fractional comparisons with the same denominator or in scientific thinking involving a half scientific thinking. She suggested researching with younger MLD students as the subjects. Although this study involved younger students with MLD, a similar result was found: students with MLD have difficulties in resolving the problem of scientific thinking comparisons.

Furthermore, Lewis (2016b) explained that the partitioning activity was probably the root of understanding the quantity of Mathematical skills in regular students. Students with MLD may not follow this pattern of development. In our finding, Indonesia's national curriculum teaches mathematical skills with partitioning activities, which are beneficial for regular students, but not necessarily helpful to students with MLD; this can happen because MLD students do not follow a developmental pattern like their regular peers.

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EFFECT OF COGNITIVE THERAPY PROGRAM ON INCREASING PERSONAL INTELLIGENCE

Abstract: The Personal intelligence is one of the multiple intelligences concerned with individuals` internal characteristics. It plays a major role in understanding of oneself in all one`s aspects being aware of one`s abilities and acting accordingly. personal intelligence also reveals the extent of individual`s honesty with themselves and enhances their understanding of their emotions, intentions, and goals The cognitive therapy method developed by Beck suggests that individuals are subject to negative concepts and automatic thoughts that cause negative feelings about the self. The therapeutic method is based on the cognitive model, which states that thoughts, feelings and behaviors are paramount, and that individuals can overcome difficulties and achieve goals by identifying and changing their patterns of thinking. cognitive distortions result from inaccurate thoughts, problem behaviors, and painful emotional responses. In cognitive therapy individuals work in collaboration with the attending physician to develop the skills to test and modify beliefs, identify cognitive distortions, improve communication with others, and change behaviors. This study implemented a cognitive therapy program to develop personal intelligence, which showed his indirect effect on the impulsivity. A sample consisted of 26 students from a science and humanities college department in Rumah in Kingdom of Saudi Arabia. The subjects personal intelligence and impulsivity were measured before and after implementation of the program for the experimental group, The results showed that the program was effective improving personal intelligence and that impulsivity decreased with increases in personal intelligence

Keywords: Reflection, impulsivity, intelligence personal, cognitive therapy

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INTRODUCTION

Personal intelligence is among the multiple intelligences that are concerned with individuals' internal characteristics. It plays a major role in self-understanding, and it enables an individual to act accordingly. In various life situations, individuals can use this form of intelligence to direct their feelings, ideas, and needs in a positive developmental direction, according to the unique strengths and weaknesses of their personality, and based on clear, conscious knowledge, and sincere analysis of their inner feelings and motivations. They can also accurately identify their desires and ambitions, increasing their awareness of their own responsibility for their lives, and thus, direct their behavior in a positive way. The cognitive therapy method developed by Beck suggests that individuals are subject to negative concepts and automatic thoughts that cause negative feelings about the self. The therapeutic method is based on the cognitive model, which states that thoughts, feelings, and behaviors are paramount, and that individuals can overcome difficulties and achieve goals by identifying and changing their patterns of thinking. Cognitive distortions result from inaccurate thoughts, problematic behaviors, and painful emotional responses. In cognitive therapy, individuals work in collaboration with the attending physician to develop the skills to test and modify beliefs, identify cognitive distortions, improve communication with others, and change behaviors.

STUDY PROBLEM

The theory of multiple intelligences, as introduced by Gardner, originally posited linguistic, logical, mathematical, spatial, musical, physical, personal, and social intelligences. In 1999,the concept of natural intelligence was added, and emotional intelligence has been suggested as a future addition. Generally,*intelligence* is an ability to solve the problemsthat oneis exposedto. One such problemis how to interact with othersand avoid making potentially regrettable decisions without forethought, which is known as impulsivity.

The research problem of this study can be summarized intotwo questions. First, does increasing personal intelligence reduce impulsivity? Second, does cognitive therapy increase personal intelligence?

STUDY HYPOTHESES

H1: Before implementation of thecognitive therapy program, there will be no statistically significant differences between the experimental and control group in terms of personal intelligence scores.

H2: Before implementation of the cognitive therapy program, there will be no statistically significant differences between the experimental and control group in terms of impulsivity scores.

H3:In the experimental group, there will be statistically significant differences interms of mean personal intelligence scores before and after implementation of the cognitive therapy program.

H4:In the experimental group, there will be statistically significant differences in terms of mean impulsivity scores before and after implementation of the cognitive therapy program.

H5:After implementation of the cognitive therapy program, there will be statistically significant differences in the experimental and control groupsin terms of mean personal intelligence scores.

H6: After implementation ofthe cognitive therapy program, there will be statistically significant differences between the experimental and control group in terms ofmean impulsivity scores.

H7:In the experimental group, there will be no statistically significant differences between mean personal intelligence scores immediately after implementationof the cognitive therapy program, and after the follow-up period.

H8:In the experimental group, there will be no statistically significant differences between mean impulsivityscores immediately afterimplementation of the cognitive therapy program, and after the follow-upperiod.

IMPORTANCE OF THE STUDY

In the latter half of the 20th century, contemporary psychology attractedan increasing generalinterest in information processing and particularly in cognitive (reflection - impulsive)

methods, asan individual is capable of handling, processing, storing, and retrieving information.A variety of cognitive processesoccur within the mind before an answer is reached(Ghoneim, 2002). Gardner's book onmultiple intelligences first calledinto question the idea that an individual's abilities could be observed fullywith a single measure of intelligence. (Gardner, 1999). University students tend tofeel a sense of impulsivity in various circumstances,andacting on this impulsivity may lead them to takeactions they later regret. Thus,it is important to study ways to mitigateimpulsivityanddevelop reflectivity, such as using a cognitivetherapy programto develop personal intelligence, as is reportedin the present study.

THEORETICAL BACKGROUND

COGNITIVE THERAPY

Cognitive therapy is a form of psychotherapy originally developed by Aron Beck. It comprisesa set of processes focused on guiding ideas and cognitive processes, both verbal and conceptual, and on the individuals' assumptions that define those processes (Leahy, 2000)within the theory of cognitive therapy.

Beck refers to a set of related concepts:

*Guided discovery*is a method used by the therapist to regulate how the subject identifies thought processes and negative beliefs.The nature, meaning,and interpretation of immediate thoughts are examined to identify and correct false assumptions and beliefs (Wells, 1997).

*The cognitive triangle*suggests that negative attitudes or views are directed toward three main elements—the self, the world, and the future—and that by default,all a subject's problems concern one or more of these elements (Bellack, Hersen, &Kazdin, 1982).

Schemas are mental structures that guide the individual in processing information, and that help people understand and organize their life experiences. Beck believed that they generate an individual's various cognitive distortions, and considered that theyplay a role in either increasing or decreasing anindividual'sownfusion in different situations. Schemas begin to form in the early stages of life, and are established in the middle years of childhood (Bellacket al., 1982).A previous clinical study in this area by Al-Faqih (1995),aimed to identify the effectiveness of the cognitive method and the method of hope in hospital treatment of addiction,measuring themost important aspects of the therapeutic effect and the improvement ofaddictive symptoms. The study's sample consisted of two cases at Al-Amal Hospital in Jeddah. Cognitive processes were found to have played an important role in the development of addictive behaviors, and cognitive psychotherapeutic methods had agreat impact on reducing addictive symptoms and motivations.Psychotherapeutic methods,with a particular focus on the cognitive method,result in greater improvement than one method of treatment only,asdemonstrated by the steady improvement observed when the cognitive method was implemented following other methods.Another study evaluated the effectiveness of cognitive therapy and participation in activitiesto reduce depression among patients in elderly care(Al- Essa,2007). Study participants were identified through application of Beck's depressioninventory, with 10 individuals each in thefirst experimental group (cognitive therapy),second experimental group (participation in activities), and the control group. The results indicated statistically significant differences between the two experimental groups, and the control group.In favor of the experimental groups, no significant differences were found between the two experimental groups: cognitive therapy and participation in activities.

PERSONAL INTELLIGENCE

Researchers have defined personal intelligence in various ways. Some identify it as:

An internal ability that enables individuals to form an accurate model of themselves, and to use that model to work effectively in life (Goleman, 1995).

Others describe it as the ability to properly perceive oneself to be aware of one's inner feelings, values, and beliefs as manifested in one's thinking, motivations, and weaknesses, and use information to directone's thinking when making decisions (Denig, 2004,p. 18).

Still, others citeit as the ability to form an accurate self-image (knowledge of one'sown strengths and weaknesses), understand one's internal psychological state, intentions, motivations, moods, and desires,and practice self-discipline, self-understanding,and self-esteem (Armstrong, 2006).

Finally,the concept can refer to an individuals'ability to deepen their self-awareness and understand theirpersonal characteristics and the limits of their abilities as well as how to interact with various circumstances, what to avoid, and what remedial actions to take (Hussein,2005).

Mohammed (2007), Sheikh (2011), and Mohamed(2011)concur in calling this form of *intelligence*, as *internal or individual*, as it requires time to think and reflectan individual's attitudes towardparticipation in withdrawal from peer groupsas determined by their mental abilities.Other scholars(Afaneh &Khazindar, 2007; Al-Kashefy, 2011)have provided behavioralindicators ofpersonal intelligence, namely:good individual work performance and a tendency to take on individual projects; self-confidence and a willingness to face challenges, with patience in adversity;a realistic perception of strengths and weaknesses;a commitment to ethical and religious principles and values,and awareness of feelings and subjectivity;an ability to identify and pursue personal needs;a preference for games that require focus;ability to remember situations and events with a major impact on the individual;and a tendency to ask imaginative and reflective questions. Philosophers, psychiatrists, scientists, and sages have all been identified as examples of people who exhibit high personal intelligence.

People with personal intelligence are skilled at personal decision-making, have a good awareness of their goals, and can thus, adjust and correct their behavior accordingly,andneed not depend too much on others. Further, theyare reflective and not hasty to express opinions, are conscious of their inner feelings, and show self-awareness in their social relationships (Al-Makashfi, 2011).Phrases that describe individuals with this type of intelligence include, "I always think about my future and my ambitions," "My hobbies are my own," "I would rather stay alone," and"I am thinking of having projects" (Mahmoud, 2006).Individuals with a high level of personal intelligence are self-reflective; perceive meta-cognition, such as awareness,self-monitoring, and presentation;enjoy self-discovery, organization and understand the personal strengths and weaknesses of the self (Amer, 2008).

Mohammed (2011) explainsstrategies for developing this form of intelligence. Taking a "minute to meditate" provides learners with time for reflection during scientific activities to be completed without interruption. "Personal links" link the knowledge to the learners' daily experiences in various life situations.In a "time of choice,"the learners' teacher presentstwo tasks and allowsthem the opportunity to perform them according to their personal potential. "Emotional moments" ensure that activities involve varying situations and opinions associated with different feelings, such as anger and humor. "Setting goals" is a strategy by which the teacher encourages learners to determine their own goals, both short- and long-term.A study by Demerdash (2006) examined the effectiveness of an educational program based on the theory of multiple intelligences inincreasing academic achievement. The results indicated statistically significant differences at the level of$P<.01$ between the mean scores of the experimental and control groups on the achievement test in favor of the experimental group. A study by Ibrahim (2010) aimed to determine the effect of personal intelligence on emotional and social intelligence,according to Fouad Abu Hatab's perception.Another study by Abu Hajar and Turki (2013) soughtto identify the level of multiple intelligences among a sample of gifted and ordinary students, according to the variables of gender and academic achievement. The most frequently identified type of intelligence among gifted students was logical intelligence, followed by personal intelligence, and social intelligence.The most frequent among the ordinary students was social intelligence,followed by motor intelligence, personal intelligence, and finally, logical intelligence,with gender differences in favor of ordinary male students, except for personal and social intelligence.

IMPULSIVITY

Impulsivity is an individual's tendency to respond quickly when exposed to risk.Impulsive responses are incorrect because they are taken while failing to fully consider alternative resolutions to the situation. In contrast, individuals who are less impulsive tend to carefully examine the data in a situation, consider the alternatives, and check their decision before responding(Al-Ahmad, 2001; Al-Faramawi, 1994; Ghoneim, 2002; Al Sharqawi, 1989).Impulsivity is a factor that prevents an individual from achieving basic functionality in life (DeYoung, 2011). In some individuals with clinical diagnoses such as schizophrenia, severe impulses are impossible to resist because they reduce a state of excess emotional tension. This excess can arise from an overabundance of sexual or aggressive impulses, or be due to the presence of ego defenses.However, individuals who are impulsive can perform well in other areas (Okasha, 1997).Dickman (1990) acknowledged two types of impulsiveness: functional and non-functional. He suggested that in certain circumstancesrequiring quick action, speech, or decision-making, impulsivity can be a functional trait.

Impulsivity is aresult of impaired function and abnormalities in cognitive ability and processes. A considerable amount ofneuronal signals may appear randomly at the same time, leading to difficulty in attendingto these signals and perceptual clues during information processing. Further, neurons transmit muscular commands that express the impulsivity(Schmidt, 2003). In a previous study,Abdul Hady and Abu Jedy (2014)aimed to identify correlations between impulsivity and self-affirmation among a sample of 255 students of the Arab Open University, measuring both self-affirmation and three areas of impulsivity (motor impulses,lack of planning, and cognitive impulses). They found an inverse relationship between self-affirmation and impulsivity, cognitive impulses were strongest and motor impulses were weakest, and the study sample demonstrated an average level of self-affirmation.Ibrahim and Hilal (2013)aimed to identify risk behavior and impulsivity in a sample of 225 adolescents from different secondary school educational environments (general, technical, and religious).The results indicated a positive correlation between risk behavior and impulsivity.

METHODS AND PROCEDURES

STUDY DESIGN

The study adopted a pre-post experimental designwith two groups: control and experimental. Both groups completed questionnaire scales before the intervention was performed, and again after the program was implemented,the questionnaires were completed by the experimental group only to identify any difference.

PARTICIPANTS

Initially, scales were used to measure personal intelligence and impulsivity in 90 female students from afaculty of science and humanities in Rumah. Based on the results, the students with the lowest scores in personal intelligence and the highest scores in impulsivity were selected for participation in the study. All were in the third level of specialization in Islamic studies,with an age range of 19 to 24 years.Participants were divided into two groups:experimental (13 participants)and control(13 participants). The control group did not complete any therapy program.

TOOLS

PERSONAL INTELLIGENCE SCALE

The personal intelligence scale initially consisted of 25 phrases compiled and written based on the theoretical framework of previous studies, and a review of a considerable number of existing measures of personal intelligence, including the personal intelligence scale (Mohamed, 2005).

Table 1. Factor loadings of personal intelligence scale phrases

Phrase Factor loadings			Phrase Factor loadings		
1		2	1		2
1	.354	.067	14	.425	.374
2	.485	.082	15	.558	.237
3	.008	.399	16	.213	.322
4	-.022	.579	17	.125	.537
5	.247	-.163	18	.663	.251
6	.721	.005	19	.773	.086
7	.720	.245	20	.449	-.082
8	.428	.159	21	.654	.173
9	.241	.457	22	.575	.349
10	.269	.581	23	.527	.171
11	.463	.270	24	.485	-.219
12 13	.109 .605	.526 .030	25	-.212	.503

The validity of the scale was confirmed through factor analysis with varimax rotation. The analysis resulted in two factors after recycling using the Guilford test, which accepts factors exceeding .3.In Table 1, for Factor 1, personal intelligence in behavior,16 of the 25 phrases satisfied the minimum loading value (phrases 1, 2, 6-8, 11, 13-15, and 18-24).Loadings ranged from.354 for phrase 1 to.773 for phrase19.For Factor 2, personal intelligence in thinking, 9 of the total phrases satisfied the saturation value (phrases 3, 4, 6-8, 12, 16, 17, and 25). Loadings ranged from.322 for phrase 16 to.581 for phrase 10.One of the phrases was deleted for incompatibility with the scale factors. The final scale, thus, contained a total of 24 phrases, distributed over two dimensions: personal intelligence in behavior and personal intelligence in thinking.

Each phrase on the scale is scored from 1 to 3 (1=*disagree*, 2= *maybe*, 3=*agree*), with total scores ranging from 24 to 72;scores from24 to 40 are considered to indicate low personal intelligence; scores from 41 to 56 are considered to indicate average personal intelligence; and scores from 57 to 72 are considered to indicate high personal intelligence. The reliability of the scale was calculated by re-applying it to a sample of 90 female students from a faculty of science and humanities in Rumah, at an interval of 15 days. Spearman's correlation coefficient between the two applications was 0.87. Pearson's correlation coefficient was 0.94, indicating a high level of reliability.

IMPULSIVITY SCALE

The impulsivity scale consisted of 25 phrases, compiled based on the theoretical framework of previous studies (Askar, 2016; Eysenck,1984).

Table 2. Factor loadings of impulsivity scale phrases

Phrase	Factors		Phrase	Factors		Phrase	Factors	
	1 or 2			1 or 2			1 or 2	
1	.714	-.256	10	.709	.197	19	.660	.208
2	.585	.187	11	.618	.034	20	.113	-.480
3	.012	.559	12	.560	.045	21	.459	.002
4	.567	-.092	13	-.073	.530	22	.551	-.201
5	.581	.035	14	-.050	.588	23	.666	-.191
6	.676	-.077	15	.173	.522	24	.478	-.160
7	.581	-.273	16	.194	-.533	25	.560	-.010
8	.583	-.044	17	.608	.103			
9	.607	-.009	18	-.122	-.372			

The validity of the scale was confirmed based on factor analysis, with basic components and recycling of factors by varimax rotation (Table 2).For Factor 1, impulsive behavior, 18 of the total phrases satisfied the minimum loading requirement(phrases 1, 2, 4, 5-12, 17, 19, and 21-25).Loadings range from.445 for phrase 1 to.714 for phrase28.For factor 2,impulsive thinking,4 of the total phrases (phrases 3, 13, 14, and 15) achieved the minimum loading value, with loadings ranging from.588 for phrase 14 to .522 for phrase 3.Five phrases were deleted due to

incompatibility with the scale. Thus, the final scale contained a total of 20 phrases distributed over two dimensions: impulsive behavior and impulsive thinking.

Each phrase on the scale is scored from 1 to 3 (1= *disagree*, 2= *maybe*, 3= *agree*), with inverse scoring for phrases 3,13,14, and 15.The total scores range from 20 to 60, with scores from20 to 33 indicating low impulsivity, from 34 to 47 indicating average impulsivity, and from 48 to 60indicating high impulsivity.

The reliability of the scale was calculated by re-applying it to a sample of 90 female students of a faculty of science and humanities in Rumah, at an interval of 15 days. Pearson's correlation coefficient was 0.92, indicating a high level of reliability.

PERSONAL INTELLIGENCE DEVELOPMENT PROGRAM

In the personal intelligence development program, cognitive guidance techniques were implemented over a total of 12 sessions to modify participant thinking patterns, develop their personal intelligence, and study the impact on impulsivity. Each session lasted for 45 to 60 minutes, with one session per week held over the course of three months. A summary of each program session is provided in Table 3.

Table 3. Summary of sessions of the cognitive therapy program for developing personal intelligence.

Session	Aim	Technique	Content	Homework
1	Engagement	Engagement	Dating students and making each other's acquaintance.	What are you thinking now?
2	Meditation	Self - monitoring	Participants talk about the ideas that revolve in their minds.	Meditate How do you think about yourself?
3	Understand cognitive distortions	Fill in the blanks	The researcher recalls a situation of life and contemplates understanding it in a certain way.	Why did you understand the situation like you did?
4	Learn internal commands	Self-help	In many situations, a person may break down because of incompatibility between the events and how the individual speaks and gives instructions to themselves.	What do you tell yourself in difficult situations?
5	Modified life system	Change the rules	When we find our ideas inappropriate for the situation, this contributes to modification of ideas.	Do you have static laws in your life?
6	Gain information	Installation and construction	We should always strive to increase our information because it helps us to modify our ideas.Where should we get new information?	What kinds of books are you reading or are you looking for any information online?
7	Compare information	Cognitive reconstruction	When obtaining information, there may bethe impulse to reject what is incompatible.	What do you do if there is a conflict?
8	Identify objectives	Imagination	Before implementing our ideas, we can test against our goals and current actions, and check whether the feeling corresponds to the achievement of those goals. Before acting, imagine the situation as a whole.	What are your dreams for the future?

9	Problem solving	Confrontation	It is normal to face unexpected problems. Before entering any situation, anticipate problems that could occur and look for possible solutions to help deal with unexpected problems quickly.	How do you solve your problems?
10	Think about others' opinions	Central disengagement	Learn to discuss freely. When we think about a situation, understand how we think.	Are all people like you? How do you know?
11	Modify ideas according to the situation	Flexible thinking	Attitudes may be similar but never coincide. What happens today will not happen again tomorrow in the same way, so solutions to a problem will change depending on changes in the situation.	Describe two situations encountered in two different ways.
12	Wrap-up	Wrap-up	Through the previous sessions, we learned to think about what helps to achieve goals in the quickest most beneficial way, and what is meant by personal intelligence	Apply measures

RESULTS AND DISCUSSION

H1, which predicted that "there would be no statistically significant differences between the experimental and control group in terms of mean personal intelligence before implementation of the cognitive therapy program," was supported.

Table 4.ANOVA results for mean personal intelligence scores of the experimental and control groups before implementation of the cognitive therapy program

	Sum of squares	*Df*	Mean square	*F*	*P*
Between groups	832.417	10	83.242	0.136	.978
Within groups	612.5	1	612.5		
Total	1444.917	11			

As shown in Table 4, the critical *F*-value(4.1)is greater than the calculated *F*-value (0.136).Thus, the relationship is not significant, and the null hypothesis is accepted. There were no statistically significant differences between the experimental and control group in terms of mean personal intelligence scores before implementing the therapy program.

H2, which predicted that "there would be no statistically significant differences between the experimental and control group in terms of mean impulsivity before implementation of the cognitive therapy program," was supported.

Table 5. ANOVA results for mean impulsivity scores of the experimental and control groups before implementation of the cognitive therapy program

	Sum of squares	*Df*	Mean square	*F*	*P*
Between groups	827.192	9	91.910	0.656	.726
Within groups	420.5	3	140.167		
Total	1247.692	12			

As shown Table 5, the critical *F*-value (8.8) is greater than the calculated *F*-value (0.656). Thus, the relationship is not significant, and the null hypothesis is accepted. There were no significant differences between the experimental and control group in terms of mean impulsivity scores before implementing the therapy program.

H3,which predicted that "there would be statistically significant differences between the mean personal intelligence scores of the experimental group before and after implementation of the cognitive therapy program," was supported.

Table 6. ANOVA results for mean personal intelligence scores of the experimental group before and after implementation of the cognitive therapy program

	Sum of squares	*Df*	Mean square	*F*	*P*
Between groups	1260.5	8	157.562	22.332	.014
Within groups	21.167	3	7.056		
Total	1281.667	11			

As shown in Table 6, the critical *F*-value(4.1) is less than the calculated *F*-value (22.332).Thus, the relationship is significant, and the null hypothesis is rejected. There were statistically significant differences between the mean personal intelligence scores of the experimental group before and after implementing the therapy program.

H4,which stated that "there would be statistically significant differences between the mean impulsivity scores of the experimental group before and after implementation of the cognitive therapy," was supported.

Table 7. ANOVA results for mean impulsivity scores of the experimental group before and after implementation of the cognitive therapy program

	Sum of squares	*df*	Mean square	*F*	*P*
Between groups	1044.731	11	94.976	7.598	.276
Within groups	12.500	1	12.500		
Total	1057.31	12			

As shown Table 7,the critical *F*-value(4.8) is less than the calculated *F*-value (7.598).Thus, the relationship is significant, and the null hypothesis is rejected. There were statistically significant differences between the mean impulsivity scores of the experimental group before and after implementing the cognitive therapy program.

H5,which stated that "there would be statistically significant differences between the experimental and control group in terms of mean personal intelligence scores after implementation of the cognitive therapy program," was supported.

Table 8. ANOVA results for mean personal intelligence scores of the experimental and control groups after implementation of the cognitive therapy program

	Sum of squares	*df*	Mean square	*F*	*P*
Between groups	647.750	8	80.969	28.577	.009
Within groups	8.500	3	2.833		
Total	656.250	11			

As shown in Table 8, the critical *F*-value (4.1) is less than the calculated *F*-value (28.577).Thus, the relationship is significant, and the null hypothesis is rejected. There were statistically significant differences between the experimental and control group in terms of the mean personal intelligence scores after implementing the cognitive therapy program.

H6,which predicted that "there would be statistically significant differences between the experimental and control group in terms of mean impulsivity scores after implementation of the cognitive therapy program," was supported.

Table 9. ANOVA results for mean impulsivity scores of the experimental and control groups after implementation of the cognitive therapy program

	Sum of squares	*df*	Mean square	*F*	*P*
Between groups	1827.692	10	182.769	18.277	.053
Within groups	20	2	10		
Total	1847.692	12			

As shown in Table 9, the critical *F*-value (4.1) is less than the calculated *F*-value (18.277).Thus, the relationship is significant, and the null hypothesis is rejected. There were statistically significant differences between the experimental and control group in terms of mean impulsivity scores after implementing the cognitive therapy.

H7,which predicted that "there would be no statistically significant differences between the mean personal intelligence scores of the experimental group immediately after implementation of the cognitive therapy program and after the follow-up period," was supported.

Table 10. ANOVA results for mean personal intelligence scores of the experimental group immediately after implementation of the cognitive therapy program and after the follow-up period

	Sum of squares	*Df*	Mean square	*F*	*P*
Between groups	341.750	9	37.972	0.241	.947
Within groups	314.500	2	157.250		
Total	656.250	11			

As shown in Table 10, the critical *F*-value (4.3) is greater than the calculated *F*-value (0.241).Thus, the relationship is not significant, and the null hypothesis is accepted. There were no significant differences between the mean personal intelligence scores of the experimental group immediately after implementing the cognitive therapy program, and after the follow-up period.

H8,which predicted that "there would be no statistically significant differences between the mean impulsivity scores of the experimental group immediately after implementing the cognitive therapy program and after the follow-up period," was supported.

Table 11. ANOVA results for mean impulsivity scores of the experimental group immediately after implementation of the cognitive therapy program and after the follow-up period

	Sum of squares	*df*	Mean square	*F*	P
Between groups	1685.692	10	168.569	2.081	.368
Within groups	162	2	81		
Total	1847.692	12			

As shown in Table 11, the critical *F*-value (4.1) is greater than the calculated *F*-value (2.081).Thus, the relationship is not significant, and the null hypothesis accepted. There were no significant differences between the mean impulsivity scores of the experimental group immediately after implementing the cognitive therapy program, and after the follow-up period.The results of this study

reflect the cognitive method of reflectivity and impulsivity in terms of ways of thinking. Previous research, such as Hassanin (1994) who studied the divergence of some types of thinking with respect to the cognitive method of reflectivity and impulsivity, confirmed that the cognitive method differs from the motivation method. The study indicated a correlation between reflectivity and impulsivity, and an individual's method of abstract thinking. Similarly, Al-Omari (2007) aimed to study the reflectivity and impulsivity method, and its relationship to social responsibility among 329 students of the College of Education for Girls in Jeddah Province. The results indicated differences in reflectivity and impulsivity among the students in terms of age and social status. Mahmoud (2016) has demonstrated a relationship between moral intelligence and personal intelligence. The study aimed to construct a causal model of the relationships between wisdom and intelligence based on a sample of 232 female students of the Faculty of Education, Majmaah University in Saudi Arabia. The results indicated direct structural and causal effects of moral intelligence and its dimensions (justice, self-censorship, respect, conscience, empathy, and tolerance),and causal effects of personal and social intelligence in the dimensions of wisdom (emotional, meditative, and cognitive).

Another study (Al-Kayab, 2003) examined the psychological structure of objective intelligence, social intelligence, and personal intelligence, and their relationship with information processing, with respect to gender and academic specialization. The results, based on a study sample of 625 students from Ain Shams University, Faculty of Education ,indicated a negative correlation between the two personal intelligence dimensions—social and subjective personal intelligence—and deep information processing in both men and women in scientific disciplines, and a negative correlation between subjective personal intelligence and average information processing in both men and women in literary disciplines.

Personal intelligence is influenced by a considerable number of factors, in other words, it can be modified. This has been demonstrated by the use of cognitive therapy to develop personal intelligence, as in the attempt by Al-Faqih(1995) to modify the thinking patterns of heroin addicts in support of their addiction treatment. The study, which involved a sample of two cases from Al-Amal Hospital in Jeddah, indicated that cognitive processes play an important role in the development of addictive behaviors, and that cognitive therapy methods had a significant impact on improving thinking patterns in addicts.

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PREVALENCE AND FACTORS ASSOCIATED WITH SOCIAL NETWORKING ADDICTION AMONG SAUDI UNIVERSITY STUDENTS: A CROSS-SECTIONAL SURVEY

Abstract: This study aims to determine the prevalence of social networking addiction among Saudi university students and its association with demographic variables. It also aims to assess students' perceptions of the benefits of social media and explore the relationship between social media usage and students' preferred social networking platform. Method: This cross-sectional study was conducted in April 2019 on male and female students enrolled at Taif University, Saudi Arabia. An online questionnaire was distributed through popular social media platforms (Twitter, Instagram, and WhatsApp). The questionnaire included questions on demographic characteristics, items that reflect addiction, and the advantage of social networking site use scale. Pearson's correlations test was used to assess the association between continuous variables, including the students' perceptions of social media addiction, advantage of social media use, usage of different social media platforms, and daily hours of social media use. Results: Of the 996 university students invited to participate, 697 completed the survey, representing a response rate of 70.0%. Overall, the mean rating for the students' perceived social media addiction was 2.71/5. Conversely, their overall perception of the advantages of using social media was 3.31/5. Students' perceived usefulness of social media significantly exceeded their perceived addiction to social media ($p < .001$). Pearson's test indicated that students' perceptions of social media addiction correlated significantly and positively with their perceptions of the advantages of social media use ($r = .38$, $p < .010$). Overall, the hours of daily social media use, frequency of social media use during lectures, Snapchat use, and students' perception of the advantages of social media were predictors of social media addiction.

Keywords: Addiction; social media; social networking addiction; Facebook, Instagram, Snapchat, Twitter, WhatsApp

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INTRODUCTION

communication has made life easier, increased productivity, and simplified communication; however, it is not without its downsides. One phenomenon that is worthy of attention is addiction to the Internet, which has been mostly associated with smartphone use (Mohammadi et al. 2018). The phenomenon of Internet addiction encompasses several types of addiction, including addiction to smartphones, video games and social networking sites (SNS) (Griffiths 2005). The underlying symptoms of addiction include tolerance, withdrawal, conflict, salience, relapse, and mood changes (Andreassen 2015; Griffiths 2005). Additionally, addiction is not limited to drugs and alcohol, but also includes behaviours that are often repeated excessively, causing symptoms similar to those of addiction in its entirety (Griffiths 2005).

Social networking addiction is a global phenomenon that has been studied in many countries. (Asiri et al. 2012; Azizi, Soroush and Khatony 2019; Hawi and Samaha 2017; Mohammadbeigi et al. 2011; Tang and Koh 2017). A study conducted in Singapore revealed that SNS addiction was widespread among college students, Arabia. Alshehri and Lally (2019) indicated in their study that Saudi university students used social media sites as a tool for learning and as a supplement to the curriculum, but very little research has been done around social networking addiction or to investigate the role of socio-economic factors. Additionally, no study has identified the social networking sites that mainly contribute to social networking addiction in Saudi university students.

Therefore, this study aims to determine the prevalence of social networking addiction among Saudi university students and its association with demographic variables. It also aims to assess students' perceptions of the benefits of social media and explore the relationship between social media usage and students' preferred social networking platforms.

The tremendous progress in technology and especially among females (Hawi and Samaha 2017). Additionally, a study conducted in Iranian students revealed a moderate level of social networking addiction among students, with higher levels in male students (Azizi et al. 2019).

In Saudi Arabia, one study conducted in 2014 revealed that 94% of students attending a Saudi university owned a smartphone (Alfawareh and Jusoh 2014), which has been associated with social media addiction. Another study conducted in Saudi Arabia revealed that 97.6% of students used social media (Alshehri and Lally 2019). Additionally, 56% of the students surveyed owned mobile devices with Internet access. According to another report, Saudi university students were at high risk of developing an addiction to smartphones, which was associated with negative academic performance (Alosaimi et al. 2016). This finding is in line with a more recent study conducted among Saudi students that found that 71% of the respondents were addicted to their smartphones (Venkatesh, Jemal and Samani 2019). Furthermore, the investigators reported that

SNS use was significantly associated with smartphone addiction.

Andreassen (2015) defined social networking addiction as "being overly concerned about online social networking use to be driven by a strong motivation to log on to or use online social networking that impairs other social activities, studies/jobs, interpersonal relationships, and/or psychological health and wellbeing." Social networking addiction can be attributed to several reasons. For example, a study conducted in a Chinese secondary school suggested that the restriction of phone use in students probably led to a state of pressure and deprivation that resulted in students later becoming addicted to social media as a form of freedom at the university level (Yang, Asbury and Griffiths 2019).

While several studies have investigated social media networking addiction across different countries, there is a paucity of data on social media addiction among university students in Saudi

developed by Rayan et al. (2017). The scale measures the advantage of using the Internet among university students. Items are rated based on a five-point Likert scale ranging from strongly degree to strongly disagree. Cronbach's alpha was 0.67 for the Internet advantages scale. For the purpose of this study, the items of the scale were converted from the advantages of Internet use to the advantages of social media use. The chosen items were those considered to be associated with the usefulness of using social media; particularly in learning.

STATISTICAL ANALYSIS

The Social Package for the Social Sciences (IBM SPSS Inc., Armonk, NY) was used to analyse the data. Pearson's correlation was used to assess the association between continuous variables, including the students' perceptions of social media addiction, advantage of social media use, usage of different social media platforms, and hours of daily use of social media. The categorical principal components analysis was used to compute a standardized socio-economic index score. The relative importance of the indicators (measured using a five-point Likert-like rating) was quantified by the relative importance index (RII), which is a percentage reflecting the weighted average of the items. Results are presented as frequency (percent) and mean (standard deviation).

RELIABILITY ANALYSIS

Cronbach's test of internal consistency was used to assess the reliability of the measured indicators of social media addiction (the Bergen Social Media Addiction scale) and perceived advantages of social media (Rayan et al. 2017). As shown in Table 1, Bergen's six-item social media addiction questionnaire (Cronbach's alpha = 0.70) and the six-item social media use advantages scale (Cronbach's alpha = 0.75) were both reliable. Overall, the 12 items were measured with an overall substantial reliability (alpha = 0.78) (Nunnally and Bernstein 1994).

METHODS

This cross-sectional study was conducted in April 2019 on male and female students enrolled in Taif University, Saudi Arabia.

MEASURES

Convenience sampling was used to recruit the participants. An online questionnaire was distributed through popular social networking sites, such as *Twitter*, *Instagram*, and *WhatsApp*, available to university students. The questionnaire consisted of three parts. The first part consisted of demographic variables, such as gender, socio-economic index score (such as household income, income, parents' levels of education, family size, and students' daily personal expenses in Saudi riyals), type of electronic device used, screen size of the device, use of e-devices during the lectures, and daily social media use in hours.

The second part included the Bergen Facebook Addiction Scale (BFAS), which was developed by Andreassen (2015). The scale consists of six items that reflect addiction criteria, such as withdrawal, salience, mood modification, conflict, tolerance, and relapse. Items are rated based on a five-point scale that ranges from very rarely to very often. The composite score ranges from 6 to 30. For this study, the BFAS scale was translated from English into Arabic by following the protocol proposed by Beaton et al. (2000). Two translators were consulted for the translation and cross-cultural adaptation of self-reported measures: the initial translator (Arabic translator) translated the scale from English to Arabic, and the other translator was a native speaker from the English Department of Taif University, who checked any differences between the original and back translation. Any differences between the two versions were and sought and resolved between the two translators. Additionally, the validity and relatability of the final draft was tested on 50 students.

The third part of the questionnaire consisted of the advantage of social networking site use scale

Table 1: Reliability analysis of the questionnaire

	Number of items	Cronbach's alpha
Perceived advantages of social media	6	0.70
Perceived social media addiction	6	0.75
Overall questionnaire	12	0.78

females. Approximately 19.7% of the students' mothers were illiterate, compared to 7.0% of the fathers who were unlettered (Table 2). Most of the students lived with their families in a family-owned home (75.9%). The mean (SD) household size, including the parents, was 8.6 (3.6) members. The students reported a mean (SD) daily personal expense of 30.1 (25.8) Saudi riyals (SAR). When asked to rate their household incomes on a Likert-type scale, with 1 = very low income and 6 = very high income, the mean household income rating was 3.3 (1.0) SAR. This represented middle to above average household income rating, with 50.8% of the students reporting that they came from middle income households.

ETHICAL CONSIDERATIONS

Ethical standards (Vancouver) were followed throughout the study. The students participated in the survey after signing an informed consent. In order to preserve the privacy of the students, researchers did not ask them to be named in the questionnaire and assured them that the information would remain confidential and available for analysis purposes only.

RESULTS

Of the 996 university students invited to participate, 697 completed the survey, representing a response rate of 70.0%. Of these, 72.3% were

Table 2: Students' socioeconomic and demographic characteristics

Variables	Frequency	Percentage
Gender		
Female	504	72.3
Male	193	27.7
Mother's educational level		
Illiterate	137	19.7
Elementary	148	21.2
Middle stage	123	17.6
Secondary	128	18.4
College	26	3.7
Higher studies	135	19.4
Father's educational level		
Illiterate	49	7.0
Elementary	81	11.6
Middle school	114	16.4
Secondary	199	28.6
College	38	5.5
Higher studies	216	31
Type of family housing		
Rented	168	24.1
Family owned	529	75.9
Monthly household income rating		
Very low	37	5.3

Low	56	8
Middle	354	50.8
Above average	167	24
High	66	9.5
Very high	17	2.4

third admitted to using them often during lectures and a slightly smaller proportion reported seldom using these devices during lectures (Table 3). Overall, the mean (SD) usage of social media during lectures was rated 2.3 (1.0) out of four points. They reported spending on average 7.4 (5.5) hours daily on social media sites, with 75% using social media daily for ≤ 10 hours.

More than half of the respondents (64.0%) used smartphones for social media and only a very small proportion reported using iPads for social networking (Table 3). Approximately 69.2% of the students reported that their devices had medium-sized screens. Regarding the use of mobile devices during lectures, a little over one-

Table 3. Descriptive statistics of students' self-rating of electronic devices and social media usage

Variables	Frequency	Percentage
Type of electronic device used		
iPad	10	1.4
Smartphone	446	64.0
Another device	241	34.6
Screen size of the device		
Small	70	10
Medium	482	69.2
Large	145	20.8
Use of e-device during lectures, mean (SD)		
Never	173	24.8
Seldom	241	34.6
Often	247	35.4
Quite often	36	5.2

INDICATORS OF STUDENTS' PERCEIVED ADVANTAGES OF SOCIAL MEDIA

The top indicator of students' perceptions of the advantages of social media were "using social media to help them in their studies" (mean rating = 3.75/5, RII = 75.1%). This indicator was followed by students' perceptions of feeling more informed than others because they used social media (mean rating = 3.69/5, RII = 73.7%) and their perceptions that they could solve many problems with the help of social media (mean rating = 3.51/5, RII = 70.2%). Other indicators of students' perceived usefulness of social media are shown in Table 4.

INDICATORS OF SOCIAL MEDIA ADDICTION

The top indicator of social media addiction among university students was their self-rating of an urge to use social media more and more (mean frequency rating = 3.2/5, RII = 64.0%). The next most ranked indicator of social media addiction among the university students was "using social media in order to forget about their personal problems" (mean frequency rating = 2.95/5, RII = 59.1%). Other indicators of students' addiction to social media are shown in Table 4.

Table 4: Descriptive statistics and relative importance index analysis of the students' perceptions of social media addiction and advantages of social media

Indicators	Mean (SD) Likert Rating	RII (%)	Rank
Perceived advantages of social media			
1. Social media helps me a lot in my studies	3.75 (1)	75.1	1
2. I can solve many problems with the help of social media	3.51 (1.1)	70.2	3
3. I make good friendships with different people on social media	2.78 (1.33)	55.6	6
4. Using social media does not make me feel lonely	3.34 (1.2)	66.9	4
5. Using social media makes me feel self-confident	2.79 (1.3)	55.8	5
6. I feel that I am more informed than others because I use social media	3.69 (1.1)	73.7	2
Perception of social media addiction			
1. I spend a lot of time thinking about social media or planning my use of social media	2.49 (1.2)	49.8	5
2. I feel an urge to use social media more and more	3.2 (1.3)	64.0	1
3. I use social media to forget about my personal problems	2.95 (1.31)	59.1	2
4. I have tried to cut down my use of social media without success	2.55 (1.4)	50.9	4
5. I would become restless or troubled if I was prohibited from using social media	2.77 (1.4)	55.3	3
6. I use social media so much that it has a negative impact on my job or studies	2.32 (1.3)	46.4	6

Abbreviations: RII, relative importance index; SD, standard deviation.

Overall, the mean rating for the students' perceived social media addiction was 2.71/5. Conversely, their overall perception of the advantages of using social media was 3.31/5. Further analysis using a paired samples t-test showed that the students' perceived usefulness of social media significantly exceeded their perceived addiction to social media ($p < .001$).

The students' self-rating of how often they used social media during lectures was 2.26/4 points (Table 5). The students' mean rating of their frequency of different social media platforms was highest for Snapchat (4.5/5) and lowest for Facebook (1.16/5). The total score for the students' frequency of usage of these social media platforms was 18.51/25, which corresponds to a 74.4%usage.

Table 5: Descriptive statistics of the students' perceptions of internet addiction, social media advantage and usage

Indicators	Mean (SD)	Maximum Possible Score
Perceived addiction to social media	2.71 (0.86)	5
Perceived advantages of social media	3.31 (0.75)	5
Self-rated use of phone during lectures	2.26 (1)	4
Likert rating of Facebook use	1.16 (0.57)	5
Likert rating of Twitter use	3.6 (1.3)	5
Likert rating of Instagram use	4.13 (1.15)	5
Likert rating of Snapchat use	4.5 (0.94)	5
Likert rating of WhatsApp use	4.74 (0.59)	5
Overall use of social media platforms	18.41 (2.55)	25

Abbreviations: RII, relative importance index; SD, standard deviation.

PERCEIVED ADDICTION TO SOCIAL MEDIA

Pearson's test indicated that students' perceptions of social media addiction were significantly positively correlated with their perceptions of the advantages of social media ($p < .010$). Similarly, the average hours of daily social media use was significantly positively correlated with their perceived addiction to social media ($p < .010$). As shown in Table 6, a positive and significant correlation was also found between the students' perceptions of the advantages of social media and their self-rating of their use of Twitter, Instagram, and Snapchat ($p < .010$ in all cases). Furthermore, the students' self-rated frequency of use of social media during lecture times correlated positively and significantly with their self-rated social media addiction score ($p < .010$).

Table 6: Pearson's correlation showing the correlation between students' perceptions of social media addiction and other variables

	Perceived addiction to social media	Advantage	SES	Hours use	Daily expense	Family size	Facebook	Twitter	Instagram	Snapchat	WhatsApp
Perceived advantage of social media	.381**										
Socio-economic index	.014	.023									
Hours of daily social media use	.220**	.150**	.054								
Daily personal expenses in SAR	-.003	-.063	.136**	-.022							
Family size	.063	.10*	-.476**	.10*	-.040						
Likert rating of Facebook use	-.037	-.034	-.049	-.033	.056	.031					
Likert rating of Twitter use	.129**	.13**	.10*	.20**	.054	.018	-.001				
Likert rating of Instagram use	.087*	.14**	.10**	.12**	-.017	-.038	-.064	.201**			
Likert rating of Snapchat use	.157**	.20**	.071	.171**	.035	.038	-.099**	.170**	.304**		
Likert rating of WhatsApp use	-.014	.009	-.019	.079*	.057	.042	-.085*	.070	.066	.252**	
Phone use during lectures	.136**	.044	-.010	.261**	.071	.061	.081*	.188**	.027	.106**	.122**

Abbreviations: SES, Socio-economic index; SAR, Saudi riyals
* Correlation is significant at the 0.050 level (2-tailed). ** Correlation is significant at the 0.010 level (2-tailed).

PERCEIVED ADVANTAGE OF SOCIAL MEDIA USE

The students' perceptions of the advantages of social media correlated significantly with their total hours of daily social media and e-device use ($r = .15$, $p < .010$). Furthermore, a weak but significant positive correlation was found between family size and students' perceived advantage of social media ($p < .010$). Likewise, a significant positive correlation was found

between students' usage frequency of Twitter ($p < .010$), Instagram ($p < .010$), and Snapchat ($p < .010$) and their perceptions of the advantages of social media.

A significant positive correlation was found between socioeconomic index and students' daily expenses ($p < .010$) and their frequency of Twitter use ($p < .010$) and Instagram use ($p < .010$). Conversely, a negative correlation was found between socioeconomic index and family size ($p < .010$; Table 6).

AVERAGE HOURS OF DAILY SOCIAL MEDIA USE

The average hours of daily social media use correlated significantly with social media addiction ($r = .220$, $p = .010$) and students' perceptions of the advantage of social media ($r = .150$, $p = .010$). Additionally, the average hours of daily social media use correlated positively with family size ($p < .050$), usage frequency of Twitter ($p < .010$), Instagram ($p < .010$), Snapchat ($p < .010$) and WhatsApp ($p < .050$). Of note, students' average hours of daily social media use correlated positively and significantly with their usage of social media during lectures ($p < .010$).

SOCIAL MEDIA USE DURING LECTURES

The use of social media during lectures was positively but weakly correlated with students' average hours of daily social media use, including the use of Facebook, Twitter, Snapchat, and WhatsApp. Additionally, the students' self-rated usage of Facebook had a weak correlation with the usage of the other social media platforms (Table 6). The independent groups t-test indicated that male and female students did not differ significantly in their mean perceived social media addiction ($p = .414$). They also did not differ significantly in their perceptions of the advantages of social media ($p = .942$). On the other hand, a t-test showed that the mean socioeconomic indexes differed significantly between male and female students (Table 7). Female students had a significantly higher mean socioeconomic and educational class score than their male peers ($p = .046$). Moreover, female and male students did not differ significantly in their usage of Facebook, Twitter, and WhatsApp ($p > .050$ for each variable). An independent samples t-test showed that males and females differed in their usage of Instagram and Snapchat, with female students using both platforms more often than their male peers ($p < .050$ in each case). Female students also reported significantly more hours per day of social media use than their male counterparts ($p = .009$).

Although there was no significant difference in the mean frequency of social media use during lectures between the two genders, male students reported using social media slightly more often than females ($p = .126$). The chi-square test of association showed that male students were slightly more likely to use smartphones than their female peers for social media networking ($p = .068$). Similarly, a non-significant difference was found between males and females regarding their usage of various mobile devices based on screen size ($p = .229$).

Table 7: Bivariate comparison between male and female students for significant differences on their mean perceptions and other predictors*

Indicators	Gender		P-value
	Female Mean (SD)	Male Mean (SD)	
Perceived addiction to social media	2.73 (0.9)	2.7 (0.9)	.414
Socio-economic educational index	0.048 (1.01)	-0.123(1.01)	.046
Perceived advantage of social media	3.31 (0.8)	3.31 (0.8)	.942
Household size	8.53 (3.6)	8.62 (3.3)	.783
Facebook use	1.14 (0.5)	1.23 (0.7)	.127
Likert rating of Twitter use	3.67 (1.3)	3.42 (1.3)	.024
Likert rating of Instagram use	4.3 (1)	3.69 (1.3)	< .001

Likert rating of Snapchat use	4.6 (0.9)	4.35 (1.04)	.015
Likert rating of WhatsApp use	4.73 (0.6)	4.8 (0.6)	.532
Hours of daily e-device/social media use	7.8 (5.7)	6.6 (4.7)	.009
Phone use during lectures	2.23 (1)	2.35 (1)	.126
Type of phones/devices			
iPad	9 (1.8%)	1 (0.5%)	.068
Smartphone	311 (61.7%)	135 (69.9%)	
Another device	184 (36.5%)	57 (29.5%)	
Screen size of the device			
Small	45 (8.9%)	25 (13%)	.229
Medium	356 (70.6%)	126 (65.3%)	
Large	103 (20.4%)	42 (21.8%)	

*Data are presented as mean (standard deviation) and frequency (%) unless otherwise specified.

A bivariate analysis revealed that male and female students did not differ significantly in their perceived social media addiction (p = .689, Table 8). However, there was a slight difference in the mean social media addiction across maternal education levels (p = .080). Moreover, social media addiction was not statistically significant across the students' fathers' educational levels, household income, and housing type (p > .050 in each case).Welch's adjusted one-way ANOVA showed a significant difference in the students' mean perceived social media addiction across the levels of their use of social media during lectures (p = .003). Additionally, a Games-Howell post-hoc follow-up pairwise comparison showed that students who often used social media during lectures were significantly more addicted to social media than those who reported that they seldom used media during lectures (p = .037). Those who reported often using social media were also significantly more addicted to social media than those who reported that they had never used social media (Table 8).

Table 8: Bivariate analysis showing the association between students' mean social media addiction score and other variables

Variables	Mean (SD) Social Media Addiction	P-value
Gender		
Female	2.73 (0.86)	.414
Male	2.67 (0.88)	
Mother's educational level		
Illiterate	2.719 (0.84)	.080
Elementary	2.62 (0.85)	
Middle school	2.81 (0.88)	
Secondary school	2.71 (0.90)	
College	3.12 (0.93)	
Higher studies	2.64 (0.82)	
Father's educational level		
Illiterate	2.61 (0.81)	.329
Elementary	2.59 (0.89)	
Middle school	2.65 (0.88)	
Secondary	2.79 (0.81)	
College	2.88 (1.1)	
Higher studies	2.72 (0.86)	

Type of family housing		
Rented	2.72 (0.9)	.932
Family owned	2.71 (0.9)	
Monthly household income rating		
Very low	2.75 (0.78)	.139
Low	2.76 (0.84)	
Middle	2.68 (0.87)	
Above average	2.79 (0.81)	
High	2.55 (0.91)	
Very high	3.13 (1.2)	
Type of electronic device used		
iPad	3.15 (0.50)	.076
Smartphone	2.75 (0.87)	
Another device	2.64 (0.84)	
Screen size of the device		
Small	2.78 (0.82)	.531
Medium	2.69 (0.87)	
Large	2.76 (0.79)	
Use of e-device during lectures		
Never	2.55 (0.98)	.003
Seldom	2.66 (0.78)	
Often	2.85 (0.81)	
Quite often	2.88 (0.98)	

A multivariate binary logistic regression showed no significant association between gender and students' odds of having a higher than average social media addiction score ($p = .581$) after accounting for the other predictors in the model. Additionally, there was no significant association between socioeconomic and educational score and students' odds of having a high social media addiction ($p = .904$) after taking the other predictors into consideration. Similarly, family housing type did not correlate significantly with students' odds of having a high social media addiction either. However, the model showed that average hours of daily social media use was positively and significantly associated with higher odds of being addicted to social media ($p < .001$), after controlling for other predictors in the model. The students' self-rated use of social media during lectures had a significant positive correlation with their odds of having a higher than average social media score ($p = .041$), after accounting for other factors in the model.The students' perceptions of the advantages of social media correlated significantly and positively with their odds of having a high social media addiction score, after accounting for other variables. Snapchat use was significantly and positively associated with high odds of being addicted to social media ($p = .042$) after accounting for the other predictors. However, the model suggested that Facebook, Twitter, Instagram, and WhatsApp use, phone type, and screen sizes were not significantly associated with the students' odds of having a high social media addiction score.

Overall, the hours of daily social media use, frequency of social media usage during lectures, Snapchat use, and students' perception of the advantages of social media were predictors of social media addiction. The other predictors did not correlate significantly with addiction to social media.

DISCUSSION

Despite the widespread use of social media by Taif University students, the rate of social networking addiction is low. The number of hours spent on social media and the use of e-devices

during lectures may be major indicators of this addiction. The analyses showed a correlation between Snapchat use, but not other social media tested, and addiction to social media networking. This may be due to several reasons: the ease of using the application and not relying on written texts because images can be viewed and circulated easily, the convenience of using an application that is free of annoying ads, and the ability of users to view live images from the daily lives of celebrities. Of note, Snapchat has previously been a predictor of addiction and has been reported to be more popular than Instagram (Alshehri and Lally 2019).

This study revealed that SNS addiction did not differ significantly between male and female students—a finding that is in line with that reported by other investigators (AlBarashdi and Aldhafri 2019; Koc and Gulyagci 2013), but contradictory to that reported by Andreassen, Torsheim and Pallesen (2014). In a survey conducted among students at an Omani university, AlBarashdi and Aldhafri (2019) did not find statistically significant differences between the genders regarding their addiction to social networking sites. In another study, no statistically significant differences were found between males and females regarding their likelihood to be addicted to Facebook (Salem, Almenaye and Andreassen 2016). Similarly, Koc and Gulyagci (2013) found no statistically significant association between addiction to social networking sites and certain demographic variables, such as the number of hours of employment, gender, age, and educational level. Conversely, the same investigators found that factors such as the number of hours of employment, cumulative rate, and level of family income were significantly associated with social media addiction.

Smartphone addiction has been associated with the daily amount of smartphone use (Alhazmi et al. 2018). In this study, the average hours of daily social media use was significantly correlated with social media addiction and students' perceptions of the advantages of social media. In their study, Andreassen et al. (2014) found that addiction to social networking sites was increasing among users with more hours of employment than normal, male users, younger users, and more educated users. However, this study did not explore other characteristics, such as students' level of studies or extracurricular activities (full-time or part-time job), which may have influenced use of social media.

Many benefits have been associated with the use of social media among students, including being an effective tool for learning because it allows students to get information in a timely manner through different learning platforms and digital libraries, consequently, helping in the learning progress (Sattar et al. 2016). However, social media is considered a negative tool if students use it inappropriately, as was the case in this study when students admitted to using it during lectures. As noted in this study, the use of SNS during lectures was associated with addiction. However, we did not explore whether students used SNS during lectures for academic purposes or as a way to escape from a boring class atmosphere.
This study has all the limitations inherent to cross-sectional surveys, including the difficulty of deriving causal relationships from the analyses. Secondly, the study included students enrolled at Taif University only. Therefore, the findings cannot be extrapolated to the population of students enrolled at universities across other cities in Saudi Arabia. Finally, the study used a convenience sample and self-report scale, which may have introduced a bias in the results. Based on these limitations, we recommend conducting future studies that include other universities in Saudi Arabia. Additionally, because social media usage during lectures and Snapchat use are associated with social networking addiction, future studies should focus on these factors using qualitative data.

CONCLUSION

These analyses suggest that social media addiction is not prevalent among Taif University students based on their perceptions. While social media may be beneficial for students, it is important to maintain a balance so that SNS does not become a negative that puts students at risk of becoming addicted. Universities and faculty

members should develop policies on how to use these sites during lectures and raise awareness among students by creating extension programs or university social media channels that educate students about the best way to use these sites to benefit from them in their studies.

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FACULTY ATTITUDES AND KNOWLEDGE REGARDING INCLUSION AND ACCOMMODATIONS OF SPECIAL EDUCATIONAL NEEDS AND DISABILITIES STUDENTS: A UNITED ARAB EMIRATES CASE STUDY.

Abstract: University students with Special Educational Needs and Disabilities (SEND) might have lower attendance and graduation rates and lower academic performance when faculty show negative attitudes toward their inclusion at university. Limited research examines faculty's attitudes and willingness to provide students with disabilities reasonable accommodations for their successful inclusion in university in the UAE. The goal of this study was to investigate factors associated with faculty's attitudes and willingness for university students with disabilities' inclusion and accommodations. The impact of teaching experience, prior contact with students with disabilities, and severity of disability on the faculty attitudes and willingness were studied. One hundred twenty-five faculty members were recruited at a public university in Abu Dhabi to participate into a one-year quantitative study that explored their attitudes and willingness. Findings showed that the faculty had positive attitudes and willingness to provide students with disabilities with accommodations under three conditions: (1) their inclusion was fair and beneficial, academically and socially; (2) learning environment, curriculum and teaching, enhance their inclusion when faculty have less teaching load and more time; and (3) more faculty training is needed for using accommodations in classroom. Policy and practice implications concerning the students' inclusion and reasonable accommodations are discussed.

Keywords: University, SEND, inclusion, attitudes, willingness, accommodations.

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INTRODUCTION

The United Arab Emirates (UAE) embraced the movement of inclusion of students with Special Educational Needs and Disabilities (SEND) in elementary, secondary and post-secondary education. The UAE Federal Law (2009), attempted to protect students with special needs and disabilities' rights to education at all levels. Several Arab countries have adopted a comparable stance to the inclusion movement, including students with SEND in primary, secondary and post-secondary education. The Salamanca Declaration (UNESCO, 1994) established equal educational opportunities for students with SEND (Leyser and Greenberger, 2008) passing a law, which reaffirms the commitment to education for all, and recognizes the necessity and urgency of providing education for children, youth and adults with SPED within the regular education system (UNESCO, 1994, p.7). The United Nations Convention on the Rights of Persons with Disabilities in 2006 was ratified. The Article 24 states that students with SEND should be supported to facilitate their effective education (Morley and Croft, 2011). The changed passage on the students with SEND through elementary schools into secondary schools infers transition to university.

Fichten (1988) argued that university education is equally important for students with and without SEND as it helps them realize their potential, personal goals and competitiveness in the job (Dowrick, Anderson, Heyer and Acosta 2005; Johnson 2006 as cited in Abu-Hamour 2013). According to Leyser and Greenberger (2008), one third of the university faculty noted they were not contacted by university students with SEND to discuss their needs, possibly because the university students with SEND were not sure if the university faculty had positive attitudes towards them or were willing to help them. Therefore, it is interesting to identify the factors that influence the university faculty attitudes towards the inclusion of university students with SEND in university in the UAE. market. However, individuals with disabilities seem to have lower levels of university attendance than those without disabilities. Students with disabilities were less likely than other students to attain a Bachelor within two years after high school. By the eighth year after high school, only 17% of those with disabilities obtained any higher education credential, compared to 36% of their peers, and they were much less likely to have obtained a Bachelor's degree. Rao (2004) stressed that there was minimal research in the area of inclusion at university and emphasized that few studies since 1981 studied faculty attitudes toward the academic success of university students with special needs.

Previous research indicated that the success of inclusion of university students with SEND in university depended on physical accommodations provided by university, efforts of university students with SEND to be included, university faculty attitudes and their willingness to provide educational accommodations (Abu-Hamour, 2013). Educational accommodations refer to access to lecture theatres, laboratories, libraries and auxiliary aids (e.g., hearing loops, information in accessible formats or the provision of non-medical assistance support, i.e., note-taking. (https://www.disability.admin.cam.ac.uk/thinking-about-disability/law-and-higher-education-sector-guidance).

Other research indicated that negative attitudes of university faculty may prevent university students with SEND from requesting the accommodations to which they are entitled to.

Several researchers (e.g., Abu–Hamour 2003; Alghazo, 2008; Baggett, 1994; Brouke, Strehorn and Silver, 2000) have reported that university faculty members hold positive attitudes toward the inclusion of university students with SEND in university, by expressing their willingness to teach and make course-related accommodations. Leyser and Greenberger (2008) stated that previous studies showed that faculty hold positive attitudes toward the inclusion of university students with special needs.

Table 1. Studies on University Faculty's Positive and Negative Attitudes to Inclusion.

University faculty's positive attitudes toward inclusion	University faculty's negative attitudes toward inclusion
Leyser and Greenberger, 2008	Gaad and Almotairi, 2013

Abu–Hamour, 2003	Dowrick, Anderson, Heyer, and Acosta, 2005
Alghazo, 2008	Minner and Prater, 1984
Baggett, 1994	Mc Lean et al., 1998
Brouke, Strehorn and Silver, 2000	Ryan and Stuhs, 2004
Fichten, 1988	Fekete, 2013
Leyser, 1989	Minner and Prater, 1984
Rao, 2004	
Rao and Gratin, 2003	
Van Loan, 2013	
McWaine, 2011	
Vogel, Leyser, Wyland and Brulle, 1999	
Hindes and Mather, 2007	
Foss, 2002	

In the field of inclusion, few studies in Jordan, Lebanon and Oman investigated faculty attitudes towards including university students with SEND (e.g., Abu-Hamour, 2013; Van Loan, 2013; Alqaryouti, 2010). Abu-Hamour (2013) and Van loan (2013) investigated the attitudes of faculty in relation to gender and type of disability. Moreover, Gaad and Almotairi (2013) and Alqaryouti (2010) tackled inclusion in university in the UAE and Oman. Alqaryouti's (2010) study investigated the problems that Omani university students with special needs encounter. The study consisted of 28 students, - 16 males and 12 females-. Eleven students were visually impaired and 17 students were with physical disabilities and the results revealed that the students with disabilities face difficulties' due to the type of disability as well as the gender of the students with disabilities (Alqaryouti, 2010). The aim of this study is also to investigate how the attitudes, previous contact, experience, and willingness of the university faculty affect the inclusion of university students and of their provision of educational accommodations. For this reason, the Theory of Planned Behavior (TPB) (Ajzen, 1991) was used as it examines the relationship between attitude and behavior. Moreover, Fitchen (1988) stated that the university faculty attitudes could be a vital ingredient in the success or failure of the university students with SEND. Also, Konur (2006) mentioned that examining the factor of the university faculty attitudes as being very important.

Abu-Hamour's study (2013) in Jordan, which included 170 university faculty investigated the university faculty attitudes toward including university students with SEND in HE. The results of this study revealed that the majority of the university faculty held positive attitudes toward including university students with SEND, despite the lack of training to teach such students and their unfamiliarity with disability legislation in Jordan. Moreover, a study conducted by Alghazo (2008) at two mid-sized post-secondary institutions, the University of Mu'tah in Jordan and Southern Illinois University at Carbondale (SIUC) in the United States to examine the influence of selected faculty demographic variables such as previous contact with persons with SEND. A stratified/systematic random sampling procedure was used to select 252 faculty members from each university. Findings of this study indicated that faculty at SIUC University expressed more positive attitudes toward students with SEND than faculty members at Mu'tah University. Moreover, many other studies found that university faculty expressed positive attitudes toward university students with SEND (Rao and Gratin, 2003; McWaine, 2011; Vogel, Leyser, Wyland and Brulle, 1999; Hindes and Mather, 2007; Foss, 2002).

On the other hand, many studies that investigated university' faculty attitudes toward including university students with disabilities found that the faculty's attitudes were negative (Gaad and Almotairi, 2013; Mc Lean et al.,1998; Ryan and Stuhs, 2004 as cited in Abu-Hamour, 2013). For example, Alghazo (2008) argued that negative

stereotypes from the university faculty about university students with SEND may become an obstacle for those students to succeed in their studies. Alghazo (2008) explained the origin of the negative attitudes held by university faculty could be due to the limited knowledge and understanding of the specific or special needs of university students with SEND. Alghazo (2008) added that having students with SEND in the HE classes may result in negative attitudes of university faculty thus preventing successful inclusion in the educational setting and the accommodation of those students in university life. Similarly, Minner and Prater (1984) mentioned that university faculty are exposed to stereotypes about university students with SEND and their primary negative expectations could help to decrease the chances of university students with SEND succeeding in higher studies. Fekete (2013) found that university faculty attitudes toward the educational needs of university students with SEND were negative. This study indicated that the university faculty justified their negative attitudes toward the university students because they lack the prerequisite skills needed to succeed at the university level, and believed they might have communication problems, might bother other students and require much more attention. Minner and Prater (1984) examined 210 university faculty attitudes toward university students with SEND and found that university faculty held negative attitudes toward university students with SEND and were not optimistic about their academic abilities or their ability to work with them.

Many other studies emphasized the relation between beliefs and behavior of university faculty towards including disabled students in university, such as a study by Zhang, Landmark, Reber, Hsu, Kwok and Benz (2010) that revealed university faculty personal beliefs regarding teaching university students with SEND have the most direct influence on providing reasonable accommodations to university students with SEND.

FACULTY WILLINGNESS TOWARD EDUCATIONAL ACCOMMODATIONS TO UNIVERSITY STUDENTS WITH SEND

A number of studies were conducted to investigate university faculty willingness to provide appropriate accommodations to meet the needs of university students with SEND. Leyser, Greenberger, Sharoni and Vogel (2011) conducted two studies: one in 2006-2007 and the other one in 2016-2017 and, over ten years, investigated the university faculty attitudes and willingness to provide university students with SEND with accommodations. The results of these studies show that the university faculty attitudes and willingness to make accommodations have remained positive over that time. Another study by Leyser and Greenberger (2008), which examined 188 faculty in seven universities, revealed that university faculty were helpful in providing assessment accommodation both during the assessment of competencies students needed to enter the program and during field experience. Beilke and Yssel (1999) interviewed ten students with SEND at a Midwestern university to investigate university students with SEND's perceptions of university faculty attitudes. The students reported that the university faculty were willing to make instructional accommodations, but faced a less than positive classroom climate. Dowrick et al. (2005) conducted focus groups with university students with SEND in ten states in order to identify potential educational barriers. The study showed that there was still difficulty in gaining accommodations and support for university students with SEND.

Table 2. Studies on Faculty Willingness to Provide Accommodations

Faculty willing to provide accommodations	Faculty not willing to provide accommodations
Leyser, Greenberger, Sharoni, and Vogel, 2011	Dowrick, Anderson, Heyer, and Acosta, 2005
Leyser and Greenberger, 2008	
Beilke and Yssel, 1999	

MATERIALS AND METHODS

DESIGN

This study is non-experimental where attribute variables are not manipulated and instead are studied as they are, such as experience, gender and any other personal characteristics or traits (Belli, 2009). It examines the cause and effect relationships between faculty attitudes and the experience of teaching university students with SEND in the UAE and the faculty's willingness to provide accommodations.

INSTRUMENTS

The study used a cross-sectional survey design in which the data were collected from selected individuals at a single point in time. This design is effective in providing a snapshot of current behaviors and attitudes in a population (REF). It also has the advantage of providing data relatively quickly and there is no need to wait for lengthy periods (Gay, Mills and Airasian, 2012). The researcher developed an instrument that included two surveys. The first survey instrument is entitled University Faculty Attitudes towards Inclusion Scale (FATIS). This scale intends to measure the university faculty attitudes towards including university students with SEND in higher education. The second scale was the University Faculty Willingness toward Providing University Students with Disabilities with Educational Accommodation Scale (FWTA). This scale was designed by the researcher after reviewing several studies (e.g., Alghazo, 2008; Fakete, 2013; Lorio, 2011; Southern, 2010) and various attitudinal surveys on inclusion (e.g., Antonak and Livneh, 2000; Lorio, 2011; Rao, 2002; Upton, 2000) for measuring the degree of faculty willingness to provide educational accommodations to university students with SEND.

SAMPLE

One hundred twenty five university faculty members from different colleges at a federal university in the UAE participated in the study. The number of the university faculty per university ranged from (3-34) university faculty. The percentage of the response rate was 19%. This can be considered as a low rate of participation with regard to the total number of the university faculty in the UAE University, which is more than 600 university faculty.

Table 3. Frequencies and Percentages of the University Faculty Age

Age	Frequency	Percentage
30 or less	2	1.6
31-40 years old	24	19.2
41-50 years old	48	38.4
51+ years old	51	40.8
Total	125	100.0

The participants of this study consisted of 25 (20%) female university faculty and 98 (78 %) male university faculty. Thus, the majority of the sample was male university faculty, representative of the gender ratio among university faculty at the university (see Table 3).

Table 4. Frequencies and Percentages of the University Faculty Gender

Gender		Frequency	Percentage
	Female	25	20.0
	Male	98	78.4
	Total	123	98.4
Missing	System	2	1.6
Total		125	100.0

With regards to the university faculty rank, 21 (16.8%) participants reported they were full professors, 41 (32.8%) associate professors, 28 (22.4%) assistant professors, 34 (27.2%) instructors/ lecturers and only one university faculty member did not specify his/her rank (see Table 4).

Table 5. Frequencies and Percentages of the University Faculty Rank

Rank		Frequency	Percent
	Full Professor	21	16.8
	Associate Professor	41	32.8
	Assistant Professor	28	22.4
	Instructor/ Lecturer	34	27.2
	No rank stated	1	.8
	Total	125	100.0

In terms of subject discipline, the majority of participants were from the University of Science with 34 (27.2 %), followed by the University of Business and Economics 16 (12.8%), the University of Engineering 14 (11.2%), the University of Education 12 (9.6%), the University of Law 10(8%), the University of Medicine and Health Sciences 4 (3.2%) and finally, the university of Information Technology 3 (2. 4%) (see Table 5).

Table 6. Frequencies and Percentages of the University Faculty Colleges

Colleges	Frequency	Percentage
College of Business and Economics	16	12.8
College of Education	12	9.6
College of Engineering	14	11.2
College of Food and Agriculture	9	7.2
College of Humanities and Social Sciences	14	11.2
College of Information Technology	3	2.4
College of Law	10	8.0
College of Medicine and Health Sciences	4	3.2
College of Science	34	27.2
University College	7	5.6
Total	125	100.0

The participants of the study varied in their years of teaching experience. The highest percentage was of participants with experience of 20 years and above: 37 (29.6), followed by 27 (21.6%) who had 6-10 years of teaching experience, and the same percentage 21 (16.8%) of participants who had 11-15 years and 16-20 years of teaching experience and 18 (14.4%) reported they had 1-5 years of teaching experience (see Table 6).

VALIDITY AND RELIABILITY OF THE STUDY

To establish the content validity of the two questionnaires and check their relevancy, the

researcher asked four university professors in the field of special education to judge the content of the survey and provide feedback to the researcher. The four experts made comments on a few items and suggested deleting some items to avoid unnecessary overlap. In addition, some items were revised because they presented possible ambiguity. All suggested changes by the experts were taken into consideration in the final version of each instrument. The four experts assured the validity of the content of the instrument of this study.

To examine the internal consistency of the two questionnaires the researcher administered the instrument to thirty participants, who agreed to participate in the pilot study. The sample of the pilot study was compatible with the research sample. The Cronbach's Coefficient Alpha reliability was computed. The FATIS scale had a Cronbach's Alpha internal consistency coefficient of 0.86 (n = 30). The FAWTA scale had a Cronbach's Alpha internal consistency coefficient of 0.86 (n = 30).

RESULTS

The results of the study are discussed with reference to the research questions posed.

RQ#1: What are the faculty attitudes toward including students with SEND in the university in the UAE?

With regards to the faculty attitudes towards including students with SEND in the university, the results, as shown in Table 7, indicated that university faculty attitudes were positive (overall mean= 4.77). The means of their attitudes ranged from a high of 5.80 to a low of 3.76 (high positive attitudes to moderate positive attitudes).

Table 7 Descriptive Statistics for the University Faculty's Attitudes towards Students with SEND's Inclusion

Statements	N	Mean
2. College students with SEND don't impede the learning of the students without SEND.	122	5.80
1. College students with SEND should be given the opportunity to complete their studies in HE	124	5.68
16. College students with mild SEND should be included in higher education classes.	124	5.3710
18. Students with mild disabilities can succeed in higher education classes.	122	5.3607
5. College students with SEND benefit socially in HE classes	125	5.2880
12. Students with moderate/severe disabilities can succeed in higher education classes	122	5.27
4. College students with SEND benefit academically in HE classes	125	5.1200
21. College students with mild disabilities can benefit from higher education classes like students without SEND.	123	5.0691
19. College students with mild disabilities are socially well adjusted in the higher education classes.	122	4.9754
22. College students with mild disabilities have a positive impact upon the learning environment in higher education classes.	124	4.8387
6. I like having college students with SEND in my classes.	125	4.6320

3. College students with SEND enhance the learning of students without SEND when they ask for more explanation during the lecture	123	4.5984
15. College students with moderate /severe disabilities can benefit from higher education classes like students without SEND.	124	4.57
20. The college students with mild disabilities in the class have no impact on the University faculty teaching effectiveness during the lecture.	123	4.4797
7. If I had a choice, I would teach classes that included college students with SEND.	125	4.47
8. Higher education syllabi are not too advanced for college students with SEND.	120	4.41
11. The presence of college students with moderate /severe disabilities in higher education classroom required from the university faculty to differentiate the curriculum during the academic year.	123	4.33
13. Students with moderate /severe disabilities are socially well adjusted in the higher education classes.	121	4.31
9. College students with moderate/ severe disabilities should be included in higher education classes.	123	4.27
10. College students with moderate/ severe disabilities have a positive impact upon the learning environment in higher education classes.	121	4.24
17. Students with mild disabilities classroom required from the university faculty to differentiate the curriculum during the academic year.	121	4.0413
14. The college students with moderate /severe disabilities in the class have no impact on the University faculty teaching effectiveness during the lecture.	119	3.76
Overall Mean		4.77

RQ#2: Are the faculty willing to accommodate students with SEND in the university in the UAE?

With reference to the second research question, it was explored the faculty willingness to provide accommodations for university students with SEND in the UAE. Based on the results as it is shown in Table 7, it is clear that the university faculty are willing to provide accommodation to university students with SEND (overall mean= 3.41). By ordering the items descending based on the mean, it showed that the score mean of the first 8 items ranged between (3.61-3.39) by the participants ($n \geq 123$) of this study which indicated that the university faculty were strongly willing to provide accommodations. Whereas, the score mean of the remainder items were rated as follows: 3.22 and 2.98 which indicated that the university faculty were willing to provide educational accommodation to university students with SEND (see Table 8).

Table 8. Descriptive Analysis of University Faculty Willingness to Provide Students with SEND with Accommodations.

Accommodations	N	M (mean)

Provide testing accommodation such as: time extension, alternative test formats to college students with SEND.	124	3.61
Allow note takers to assist college students with SEND during the lecture.	124	3.59
Provide other educational accommodation when necessary to college students with SEND.	122	3.53
Allow the college students with SEND to tape record the lectures when needed.	124	3.52
Allow the transcriber to write the answers during the test from certain college students with SEND (such as visually impaired students or students with motor skills difficulties).	123	3.50
Provide the college student with SEND with extra time to complete their tests and exams.	124	3.44
Allow the college students with SEND to redo missed exams without penalty when absent due to disability reasons.	123	3.40
Extend deadlines for completion of class projects, papers, assignments… etc. to college students with SEND when needed.	123	3.39
Allow the college students with SEND to use calculators during the tests.	121	3.22
Allow the college students with SEND to take an alternative form of tests such as true or false or multiple choice questions instead of essay questions.	122	2.98
Overall mean	3.41	124

RQ#3: Is there any relationship between the faculty attitudes and their willingness toward providing educational accommodations to the university students with SEND in the UAE?

With reference to the third question it was investigated whether there is any relationship between the university faculty attitudes and their willingness toward providing educational accommodations to the university students with SEND in the UAE. A correlation analysis was conducted to see whether there is correlation between university faculty attitudes and willingness to provide educational accommodation to university students with SEND (see Table 9). There was a significant relationship between faculty attitudes toward including university students with SEND and faculty willingness to provide accommodations to university students with SEND in their classroom (r =2.61). However, the level of this correlation is low.

Table 9. Pearson Correlation between University Faculty Attitudes towards Including College Students with SEND and University Faculty Willingness to Provide Accommodations

Correlations		
	Attitudes	Accommodation

	Pearson Correlation	Sig. (2-tailed)	N	Pearson Correlation	Sig. (2-tailed)	N
Attitudes	1		125	.261**	.003	124
Accommodation	.261**	.003	124	1		124

** Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

The results of the study indicated that the faculty attitudes towards including university students with SEND are positive. This finding is consistent with the findings of several previous studies (e.g., Abu–Hamour 2003; Alghazo, 2002; Baggett, 1994; Clark, 2017; Brouke, Hindes and Mather, 2007; Foss, 2002; McWaine, 2011; Rao, 2002; Rao and Gratin, 2003; Vogel, Leyser, Strehorn and silver, 2000; Van Loan, 2013; Wyland and Brulle, 1999), which indicated that university faculty hold positive attitudes towards including university students with SEND in general. The findings revealed that the university faculty were more supportive to the inclusion of university students with SEND because they believed that their inclusion in the university is fair and beneficial, academically and socially. However, they were not highly supportive of inclusion when it comes to the environment, curriculum and teaching. And this may be due to the lack of specific professional training in how to deal with and teach university students with SEND (Gaad and Almotairi, 2013). Therefore, adapting the curriculum and classroom environment are critical factors for fostering integration and higher learning. Moreover, the university faculty had a large teaching load and limited time to provide university students with SEND with the appropriate accommodation regarding the environment, teaching and curriculum. Satcher (1992) stated that the main concern of the university faculty was the load of work and the limited time to provide the university students with the required accommodations. So, university administrators may need to support university faculty to ensure that they can provide necessary accommodation to university students with SEND. With regards to the faculty willingness to provide educational accommodations for university students with SEND, the finding is consistent with previous research (Alghazo, 2008; Fakete, 2013; Leyser, Greenberger, Sharoni and Vogel, 2011), which reported that the university faculty were willing to provide educational accommodations for university students with SEND.The present study was based on the Theory of Planned Behavior (TPB) in examining the university faculty attitudes towards including university students with SEND and their willingness to provide them with educational accommodations. It was found that there is a significant correlation between attitudes and behavior. So, the positive attitudes of university faculty towards including university students with SEND may have led to their willingness towards providing accommodations to university students with SEND.

This finding was consistent with Alghero's (2008) study which stressed the significant relationship between the faculty attitudes toward including university students with SEND and their willingness towards providing educational accommodations to university students with SEND at Mu'tah University. Moreover, MacFarlane and Woolfson (2013) confirmed, as did Chubon (1992), that there is a relationship between attitudes and actions (behavior) towards students with SEND.

RECOMMENDATIONS

The reviewed literature revealed that university faculty attitudes towards including university students with SEND is a vital factor in the inclusion of these students in university (Abu- Hamour, 2013; Alghazo, 2008; Praisner, 2003; Rao, 2002). To have successful inclusion, university faculty should hold positive attitudes and should be willing to provide university students with SEND with the suitable educational accommodations depending on the type of disability. The ultimate influence on the educational and social outcomes of students with Special Educational Needs is the behavior and practices of their teachers (Efthymiou and Kington, 2017). The study's findings indicated that the

university faculty in the UAE institution held positive attitudes towards including university students with SEND in the university as they realized that these could enhance their social and academic integration. The data revealed that the majority of the university faculty were willing to provide educational accommodations to university students with SEND. Thus, what is required is only more training to provide the university faculty with the appropriate skills and knowledge that will help them to provide the required educational accommodations to university students with disabilities with regards to the type and severity of disabilities.

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