

Examination of the Levels of Hopelessness in Vocational High School Students Regarding Math Classes: Tatvan Vocational High School Example

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Abstract: The aim of this research is to examine the levels of hopelessness in students studying at vocational high schools regarding math classes according to certain variables. Accordingly, as data collection tool, Beck Hopelessness Scale which was adapted to math class by researchers to determine the levels of hopelessness in students regarding math classes was used. The study was conducted in the spring semester of the 2016-2017 academic year. The study sample is composed of a total of 139 students studying in different programs of Tatvan Vocational High School connected to BitlisEren University. Independent sample t-test and variance analysis were used for the analysis of the data collected. According to the analysis results, it is determined that levels of hopelessness in children were mild, there were no significant differences between the levels of hopelessness according to gender and programs studied, but there were significant differences according to the type of the high school graduated and math success. In addition, some recommendations based on the results obtained were presented.

Keywords: High school student, level of hopelessness, math success

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I. Introduction

It is an inevitable fact that education occupies a very serious place in information societies. Math education is also important in forming an information society and development of a country in terms of the future of the country.

Math education allows developing the opinion and perspective of an individual in the society. A perspective lets the person make interpretation from a different point of view. It is a fact that math is considered with a negative attitude by the society in today's studies as well as this study. More precisely, it is seen that math is not liked much in the society (Aydın, 2003; cited in :Yenilmez, 2010).

While the students in math class learn the concepts that require high cognitive effort inherently (Arcavi, 2003; Goldenberg, 1988), they carry an intense cognitive load as they have to keep many concepts in mind simultaneously (Just, 2010). This abstract, conceptual and prerequisite structure of the lesson causes the students to have difficulty in learning the subject. This difficulty brings about the negative attitude, fear of failure, anxiety and therefore hopelessness feelings (Yorgancı et al., 2014).

Hopelessness is generally discussed with the concept of learned helplessness in literature. Learned helplessness means that reaction and behaviors of an individual in reaching an end are vain and due to the fact that his/her efforts are unsuccessful in realizing his/her demands, the individual feels anxious and experiences fear and thus in order to control the result, his/her motivation decreases (Güler, 2005; cited in : Kılıç et al., 2014). Hope and hopelessness are opposite expectations. Hope is the positive expectation in achieving a future goal while hopelessness is the negative expectation (Dilbaz and Seber, 1993:134; cited in : Kılıç et al., 2014). Hope is the vigor of the individual. As long as an individual is hopeful, s/he makes future plans. Hopes gives strength to the individual in finding a solution to the problems s/he faces (Konukbay, 2005: 14; cited in:Kılıç et

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al., 214) While the idea of achieving a future goal is dominant in hope, the idea of not achieving it is dominant in hopelessness. The individual's belief that s/he will never overcome his/her failures, and never solve his/her problems, wrong meaning attribution to his/her life despite a lack of realistic reason and expectation of negative results from his/her goals despite not making efforts to achieve them are described as hopelessness (Deniz et al., 2007; cited in: Kılıç et al., 2014).

In the literature, research made it is seen that some studies affecting the hopelessness and level of hopelessness were made at home and abroad (Bonner and Rich, 1998; Marciano and Kazdin, 1994; Au and Watkins, 1997; cited in ; Yorgancı et al., 2014).

The number of studies made on this subject has also increased in our country in recent years (Akalin, 2006; Özmen et al., 2008; Devci, et al., 2011, Ehtiyar and Üngüren, 2008; Ağır, 2007; Yıldırım, 2007; Yenilmez, 2010; Gençay and Gençay, 2010; cited in: Yorgancı et al., 2014). Most of the studies made are the studies at secondary education and university level. It is seen that the number of the studies made at the levels vocational high schools and on math is limited. This situation makes conducting a study on this field more important. Therefore, in this study, examination of the levels of hopelessness in students studying at vocational high school regarding math classes according to certain variables was made with the thought that it will contribute to the literature.

1.1. The Aim of the Research

The aim of this research is to examine the levels of hopelessness in vocational high school students regarding math classes in terms of the variables such as gender, program, type of the high school graduated and math success. In line with this purpose, the answers to the following questions were sought.

1. What is the level of hopelessness in vocational school students regarding math lessons?
2. Is there any significant difference between the levels of hopelessness in vocational high school students regarding math lessons according to gender, program, type of the high school and math success?

II. Method

2.1. Research Model and Research Group

In the research, relational screening model was used in descriptive survey model. The screening model aims to depict the past or present condition as it is (Karasar, 2002). The research group is composed of a total of 139 students studying in Computer Technologies, Electrical, Construction Technology and Map and Cadastral programs of Tatvan Vocational High School connected to BitlisEren University. In the research group, 18.7% (N=26) of the students are female students, 81.3% (N=113) are male students, 22 of the students are the graduates of General High School, 38 of Anatolian High School and 79 of Vocational High School. In addition, 38.1% (N = 53) of the students have low, 27.3% (N = 38) have average, 19.4% (N = 27) have good and 15.1% (N=21) have a very good level of math success.

3.2. Data Collection Tools

In the research, Beck Hopelessness Scale, which consists of a total of 20 items determining the level of negative future expectation of the individual and was developed by Beck et al. (1971), was used in order to determine the levels of hopelessness in high school students regarding math lessons. The scale was translated into Turkish by Seber (1991) and the validity and reliability studies thereof were conducted. The results for the reliability of the scale adapted to math by researchers were subjected to internal consistency test and Cronbach Alpha coefficient of the scale was found as 0.80. According to this result, thereliability of the scale was accepted. Besides, in order to collect the necessary information about the students, personal information form developed by the researcher was used.

Answers such as "true-false" and "yes-no" are given to the questions in the scale composed of 20 items in total. If the answers that are given to the items "2, 4, 7, 9, 11, 12, 14, 16, 17, 18 and 20" are "yes", 1 point is given while if the answers that are given to the items "1, 3, 5, 6, 8, 10, 13, 15 and 19" are "no" 1 point is given on the scale. No points are given to the other answers. According to the scores given, a total score between 0 and 20 is obtained which represents the level of intensity of hopelessness. This total score makes up the "hopelessness score" of the person. Hopelessness scores are classified into four groups; 0-3 is no hopelessness, 4-8 mild hopelessness, 9-14 moderate hopelessness, 15-20 severe hopelessness (Beck and Steer, 1988; cited in: Aslan, 2013). At least 0, at most 20 points can be obtained from the scale. High score value indicates that the level of hopelessness in a student is high while low score value indicates that the level of hopelessness in a student is low.

2.3. Data Analysis

In accordance with the general purpose of the study, SPSS17.0 package program was used for the necessary statistical analysis of the data collected with the survey form. The average score, standard deviation

and percentage calculations were found according to the options marked by the students participating in the survey. In addition, the levels of hopelessness in students regarding math lessons were analyzed and interpreted according to gender, program, type of placement, type of the high school graduated and math success. One-way variance analysis (ANOVA) and independent sample t-test were used in data analysis. According to the result of homogeneity test of variance, the p-value was found as $0.615 > 0.05$. It can be said that variances are homogeneous, in other words, since basic assumption of the variance analysis is provided, the results obtained are healthy. Scheffe's test was used to determine which groups have a difference in the significance of the obtained F value. The level of significance in the statistical analysis was taken as 0.05.

III. Findings

In this part, the results of the findings obtained based on the data collected in line with the aim of the study are given.

1. In regard to answering the first sub-problem of the research, minimum, maximum, mean and standard deviation values of the levels of hopelessness in students regarding math lessons are given in Table 3.

Table 3. Descriptive Statistics of the Levels of Hopelessness in Students regarding Math Lessons

Variable	N	Min.	Max.	Mean	Standard Deviation
Hopelessness Score	131	1	19	7.12	4.67

When Table 3 is examined, the mean level of hopelessness in students regarding math lessons is 7.12 and the standard deviation is 4.67 and the width of the distribution is 18. According to the scale based on the research, it is seen that the students are hopeless at a mild (4-8 score range) level. This can be interpreted such that students are not too hopeless for their belief that they will be successful in math in the future.

2. In regard to answering the second sub-problem of the research, the findings of independent sample t-test applied to determine whether the levels of hopelessness in students regarding math lessons how any difference according to the gender are given in Table 4.

Table 4. T-test Results of the Levels of Hopelessness in Students regarding Math Lessons According to the Gender Variable

Gender	N	\bar{x}	Ss	Sd	t	P
Girl	26	6.115	4.140	137	-1.220	.368
Boy	113	7.354	4.775			

According to Table 4, it is seen that point averages of the levels of hopelessness in students regarding math lessons show no significant difference according to the gender variable. [$t_{(137)} = -1.220, p > .05$]. It can be said that gender variable has no significant effect on the levels of hopelessness in students regarding math lessons. Point average of girls is ($\bar{x} = 6.115$) lower than the point average of boys ($\bar{x} = 7.354$).

The results for whether the levels of hopelessness in students regarding math lessons show significant difference according to the program they study are given in Table 5.

Table 5. Arithmetic Mean and Standard Deviation Results Regarding the Point Averages of the Level of Hopelessness in Students regarding Math Lessons According to the Program They Study

Program	N	\bar{x}	Ss
Electrical	34	7.882	4.730
Computer Technologies	38	6.605	4.571
Construction Technology	33	6.212	4.580
Map and Cadastral	34	7.823	5.413
Total	139	7.122	4.674

When Table 5 is examined, the total average score value of the level of hopelessness in students regarding math lessons is ($\bar{x} = 7.122$). Score mean values of the level of hopelessness in students regarding math lessons were found as follows; Electrical program ($\bar{x} = 7.882$), Computer Technologies program ($\bar{x} = 6.605$), Construction Technology program ($\bar{x} = 6.212$) and Map and Cadastral program ($\bar{x} = 7.823$). According to these findings, point averages of hopelessness in students studying in the Electrical program are higher than the points of hopelessness in students in the other programs. Namely, there is a difference between the average scores of the programs. The findings of Scheffe's test results conducted to test whether this difference is statistically significant are given in Table 6.

Table 6. ANOVA Test Results Regarding the Levels of Hopelessness in Students regarding Math Lessons According to the Program They Study

Source of Variance	Sum of Squares	Sd	Means of Squares	F	P
Between groups	73.856	3	24.619	1,130	.339
Within groups	2941.065	135	21.786		
Total	3014.921	138			

When Table 6 is examined, no statistically significant difference is found between the point averages of the levels of hopelessness in students regarding math lessons. [$F_{(3-135)}=1.130, p>.05$]. According to this finding, it can be interpreted that the program studied did not significantly affect the point averages of hopelessness in students regarding math lessons.

The results to determine whether the levels of hopelessness in students regarding math lessons show a significant difference according to the type of the high school graduated are given in Table 7.

Table 7. Arithmetic Mean and Standard Deviation Results Regarding the Point Averages of the Level of Hopelessness in Students regarding Math Lessons According to the Type of the High School Graduated

Type of the High School	N	\bar{x}	Ss
General High School	22	5.590	3.737
Anatolian High School	38	5.578	4.734
Vocational High School	79	8.291	4.770
Total	139	7.122	4.674

When Table 7 is examined, the total point average value of the level of hopelessness in students according to the type of the high school graduated is ($\bar{x}=7.122$). Score mean values of hopelessness in students graduated from a general high school, Anatolian high school and vocational high school were found as ($\bar{x}=5.590$), ($\bar{x}=5.578$) and ($\bar{x}=8.291$), respectively. According to these findings, it is seen that the lowest point average of the level of hopelessness belongs to the students graduated from Anatolian high school while the highest point average belongs to the students graduated from vocational high school. It is seen that the levels of hopelessness in students regarding math lessons were different according to the type of the high school graduated. The results of the Scheffe's test results conducted to test whether this difference is statistically significant are given in Table 8.

Table 8. ANOVA Test Results Regarding the Levels of Hopelessness in High School Students regarding Math Lessons According to the Math Success Level

Source of Variance	Sum of Squares	Sd	Means of Squares	F	P	Difference
Between groups	250.036	2	141.248	6,149	.003	ML-GL
Within groups	2764.885	136	21.221			ML-AL
Total	3014.921	138				

ML: Vocational high school, GL: General high school, AL: Anatolian high school

When Table 9 is examined, a statistically significant difference is found between the point averages of the levels of hopelessness in students regarding math lessons according to the type of the high school they graduated [$F_{(2-136)}=6.149, p<0.05$]. According to the Scheffe's test results conducted to determine which success groups have this significant difference, a significant difference is found between the vocational high school graduate students and Anatolian high school and general high school graduate students in favor of the Anatolian high school and general high school graduate students.

The results to determine whether the levels of hopelessness in students regarding math lessons show a significant difference according to the level of math success are given in Table 9.

Table 9. Arithmetic Mean and Standard Deviation Results Regarding the Point Averages of the Level of Hopelessness in Students regarding Math Lessons According to the Level of Math Success

Math Success Level	N	\bar{x}	Ss
Low	53	11.603	4.152
Moderate	38	5.710	1.943
Good	27	4.185	1.569
Very Good	21	2.142	1.014
Total	139	7.122	4.674

When Table 9 is examined, point average value of the level of hopelessness in students according to math success is (\bar{x} = 7.122). Score mean values of hopelessness in students according to math success were found as follows; Low (\bar{x} = 11.603), Moderate (\bar{x} = 5.710), Good (\bar{x} = 4.185) and very good (\bar{x} = 2.142). According to these findings, it is seen that levels of hopelessness regarding math lessons in the students having low math success are higher than the students having moderate, good and very good math success. It is seen that the levels of hopelessness in students regarding math lessons were different according to the math success variable. The findings of the Scheffe’s test results conducted to test whether this difference is statistically significant are given in Table 10.

Table 10. ANOVA Test Results Regarding the Levels of Hopelessness in High School Students regarding Math Lessons According to the Level of Math Success

Source of variance	Sum of Squares	Sd	Means of Squares	F	P	Difference
Between groups	1893.780	3	631.260	76.012	.000	Low-Moderate Low- Good Low- Very Good
Within groups	1121.141	135	8.305			
Total	3014.921	138				

When Table 10 is examined, a statistically significant difference is found between the point averages of the levels of hopelessness in students regarding math lessons according to the level of math success [$F_{(3-135)} = 76.012$ $p < 0.05$]. According to the Scheffe’s test results conducted to determine which success groups have this significant difference, it is determined that the levels of hopelessness regarding math lessons in the students having low math success are higher than the students having moderate, good and very good math success.

IV. Conclusion, Discussion, And Suggestions

In this part, the findings obtained as a result of the research, the discussion of these findings with literature and some suggestions are included.

In the research, the mean level of hopelessness in students regarding math lessons is 7.12 and the standard deviation is 4.67. The lowest score and the highest score obtained from the scale are 1 and 19, respectively. According to these values, the width of the distribution is 18. When the criteria for the score range of the hopelessness scale suggested by the researchers are considered, it is seen that the students are hopeless at a mild level. This can be interpreted such that students are not too hopeless for their belief that they will be successful in math in the future. This finding of the research (Şahin, 2009; Yenilmez, 2010) shows similarity to the research results.

In the research, it is determined that no significant difference is found between the levels of hopelessness in students regarding math lessons according to the gender variable [$t_{(137)} = -1.220$, $p > .05$]. Point averages of female and male students are very close to each other. Point average of girls is (\bar{x} =6.115) while point average of boys is (\bar{x} =7.354). Thus, it is understood that the gender variable does not have any significant effect on the levels of hopelessness in students regarding math lessons, namely the levels of hopelessness both in female and male students regarding math lessons are similar. This result of the research is parallel to the result of the study conducted by Yenilmez (2010) with secondary school students. Similarly, Yorgancı et al. (2014) did not find any significant difference between the levels of hopelessness in students in terms of the gender variable in the research they conducted with vocational high school students. When literature is examined, it is seen that the results for gender are inconsistent. While the effect of gender on hopelessness is not significant in many studies, the level of hopelessness is higher in girls in some studies (Kazdin et al., 1983; Rodgers et al., 1986; Kashani et al, 1991; Durak, 1994; Öztürk, 1997; Gürvardar, 2001, Güleç and Küey, 1989, Yaşar, 2001; cited in:Yenilmez, 2010). In the research conducted by Ceyhan (2004) with teacher candidates, on the other hand, it is seen that boys have a higher level of hopelessness than the girls (cited in; Yenilmez, 2010).

Another important finding of the research, score mean values of the level of hopelessness in students regarding math lessons according to the program they study are as follows; Electrical program is ($\bar{x}= 7.882$), Computer Technologies program is ($\bar{x}= 6.605$), Construction Technology program is ($\bar{x}= 6.212$) and Map and Cadastral program is ($\bar{x}= 7.823$). According to these findings, point averages of hopelessness regarding the math lessons in students studying the Electrical program are higher than the points of the students in other programs. According to the Scheffe's test results conducted to determine whether this difference is statistically significant, no significant difference is found between the levels of hopelessness in students regarding math lessons. [$F_{(3-135)} = 1.130, p > .05$]. Thus, it can be interpreted that the program studied did not significantly affect the point averages of hopelessness in students regarding math lessons. This result of the research contradicts with the result of the study by Şahin (2009) called the levels of hopelessness in students studying at Faculty of Education.

In the research, a statistically significant difference is found between the point averages of the levels of hopelessness in students regarding math lessons according to the type of the high school they graduated [$F_{(2-136)} = 6.149, p < 0.05$]. According to the Scheffe's test results conducted to determine which success groups have this significant difference, the levels of hopelessness regarding math lessons in the vocational high school graduate students are higher than the general high school and Anatolian high school graduate students. One of the reasons that vocational high school graduate students have higher scores of hopelessness can be closely related to the qualities of the students graduated from this school. This finding of the study is compatible with the results of the study conducted by Yorgancı et al. (2014) with vocational high school students. Besides, according to the examination of İşgör (2003) on the psychological features of high school students working and not working in a job, it is seen that vocational high school students are more hopeless than the general high school students (cited in; Yorgancı et al., 2014).

In the research, a statistically significant difference is found between the point averages of the levels of hopelessness in students regarding math lessons according to the level of math success [$F_{(3-135)} = 79.012, p < 0.05$]. According to the Scheffe's test results conducted to determine which success groups have this significant difference, it is determined that the levels of hopelessness regarding math lessons in the students having low math success are higher than the students having moderate, good and very good math success. Thus, it can be said that the students having low math success have higher levels of hopelessness regarding math lessons while the students having high math success have low levels of hopelessness regarding math lessons. The reason may be the reflection of the positive attitude of the students having high math success towards this lesson and relying on their abilities and seeing themselves sufficient to deal with mathematical concepts. This result of the research is parallel to the result of the study conducted by Yenilmez (2010) with secondary school students. In addition, it is compatible with the results of the study conducted by Yorgancı et al. (2014) with vocational high school students.

As a result of the findings obtained in this study, it is determined that the levels of hopelessness in vocational high school students regarding math lessons are generally low, namely they are hopeless at a mild level, there is not any significant difference according to the gender and the program they study, but there are some significant differences according to the type of high school graduated and math success. In line with the research results, the following suggestions can be given.

1. It is determined that there is a significant difference between the levels of hopelessness in students regarding math lessons according to the high school they graduated and math success groups in the research. According to this result, the levels of hopelessness in the students graduated from vocational high schools and the students with low math success are the highest. Therefore, studies to develop attitude, anxiety, and self-efficacy thought to significantly increase the math success of the students should be made and practices and extra learning opportunities suitable to the levels of the vocational high school students who are hopeless regarding math lessons can be offered.

2. In the research, it is determined that the levels of hopelessness in students regarding math lessons are mild. The factors affecting this condition can be investigated.

3. In the research, the levels of hopelessness in students regarding math lessons were examined. A similar study can also be made for core lessons.

4. This research was made for the students studying in vocational high schools. A similar study can also be made on other types of school and by extending to other variables.

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