

# Effective Factors Increasing the Students' Interest in Mathematics in the Opinion of Mathematic Teachers of Zahedan

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**Abstract**—The main objective of this study was to identify factors and conditions that motivated and encouraged students towards the math class and the factors that made this class an attractive and lovely one. To do this end, questionnaires consisting of 15 questions were distributed among 85 math teachers working in schools of Zahedan. Having collected and reviewed these questionnaires, it was shown that doing activity in math class (activity of students while teaching) and previous math teachers' behaviors have had much impact on encouraging the students towards mathematics. Separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas), peers, size and appearance of math book, first grade teachers in each educational level, among whom the Elementary first grade teachers had more importance and impact, were among the most influential and important factors in this regard. Then, school environment, family, conducting research related to mathematics, its application in daily life and other courses and studying the history of mathematics were categorized as important factors that would increase the students' interest in mathematics.

**Keywords**—Interest, motivation, mathematical learning.

## I. INTRODUCTION

ONE of the common goals of all mathematics teachers at all levels of education is that students should understand and learn mathematics. Various factors are involved in shaping the understanding and learning of mathematics. However, one of the prerequisites for understanding mathematics is interest in math and the desire of students to learn it. Interest is a stimulus that increases the activity power. Simultaneous to active learning, students should be interested in the subject they are learning and students may resort to it in order to understand the materials and apply them [1]. Therefore, it is necessary to further examine the factors involved in making students interested in math so that no one hear such phrases as “not too sweet course of math! Wow! The boring math class! Monster math! By the way, why should these students often lose interest and may be forced to put up a math class?”

Various researches and investigations have been conducted to probe the factors contributing to increase in interest of elementary students in various cities. However, few researches

have paid attention to these contributing factors in higher levels. Besides, the weakness in mathematics is more vivid in the end of second grade of high school and the start of third grade of high school. Regarding the present article, the viewpoint of math teachers at various levels are collected in terms of factors affecting the level of interest of students including family, school environment, peers, first grade teacher at all educational levels, size and appearance of math book (adding some subject as math puzzles in a textbook), the previous math teachers' behaviors, doing activity in math class, conducting research in the field of mathematical themes and finding the appellation of mathematical titles, studying the history of mathematics, separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves, prior presentation of some concrete applications of mathematical themes in real life. Then, the level and depth of this impact will be gauged so that some strategies are provided for the designers and writers of textbooks as well as parents and educators. Regarding this, students are encouraged to study math more eagerly and, in this way, achieve progress in the other sciences because mathematics is a prerequisite to other sciences.

Nouri [2] conducted a research entitled “the manner by which I could succeed to identify poor performance of third-grade math students in relation to learning problem solving and formulas and encourage students in math” and could perform various strategies such as the using games and plays in mathematical class, using new method of solving mathematical issues using poetry and drama, likening the mathematical issues to daily life issues and providing creative assignments. Finally, she could conclude that strengthening the students' skills and making them active learners could enable them to progress in mathematics.

Zare [3] conducted a study entitled “strategies to increase the interest of elementary students in math” and made use of selective strategies including 1) preparing a schedule in order to diagnostically and formatively assess the students as well determining the teaching method, 2) organizing the association of mathematician children, 3) establishing the students' performance evaluation form and founding a TV network specific for children. Zare [3] accomplished the mentioned strategies and found that the number of students interested in mathematics doubled. Finally, Zare [3] concluded that using a variety of teaching methods, appropriate to the purpose of each lesson, supporting auditory and visual memory, and fostering students' precision and attention in the

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form of purposeful games could be helpful in increasing the level of their interest in math and functional activities.

Adham [4] accomplished a research entitled "reasons for poor performance of students in mathematics who are studying at the fifth level of Vahdat Elementary School of Pars Abad city" and mentioned some of the reasons for poor performance of students as: 1) unfamiliarity of some of math teachers with techniques and manners of teaching math, 2) Lack of specialized teaching methodologies in teaching math in elementary levels, 3) Lack of enough practice and neglecting of math workbook, 4) Students' unfamiliarity with the importance of math and ignorance of goal and scope of math in this level, 5) Disregard for the interests, motivations and intellectual abilities of the students when teaching mathematics.

Joosha'ei [5] attempted to address this field under a thesis entitled "examining the factors affecting the learning of mathematics in high school students". She enumerated such factors as teachers' required scientific and specialized knowledge, teachers' interest in math, teachers' interest in teaching, teachers' field of education, teachers' sense of accountability, students' activity and interest in the process of teaching and motivating students, as the most influential and effective factors affecting the quality of learning mathematics among high school students.

Ebrahimi [6] conducted a thesis entitled "examining the impact of education level of parents of students studying in the third grade in Elementary schools on their educational performance in math (case study in district 2, Zahedan)" and found that parents' educational level had impact on students' educational performance in mathematics.

Mirbalooch Zehi [7] carried out a research in the form of a thesis entitled "investigating the impact of school and the family on the creativity of students in mathematics who were studying in the third level of high schools (Experimental) in Zahedan city" and concluded that family and its relationship with the school were very important.

Bahrami Moqadam [8] conducted a thesis entitled "examining the relationship between math teacher's behavior in the classroom and educational achievement of students in Saravan city" and found that teachers' teaching methods, procedures and his/her behavior in the classroom had great impacts on educational achievement.

Khaje Mirza'ei [9] accomplished a thesis entitled "the role of parents and families in male students' educational performance in mathematics who were studying in the second year of public high schools of Zahedan" and found that parents' socio-economic status, educational level, involvement and attitudes had robust impacts on the educational performance of students.

Mathematics models other sciences. It means that the common language of scientific theories of other sciences is mathematics. Presently, if a science cannot be expressed in terms of mathematical expression, it can be argued that this science is not a science itself. Kepler, the Greek astronomer, says: "God created the world in mathematical terms". So, familiarity with mathematics is one of the necessities of

today's life. However, students are always disinclined towards this course. Besides, one of the major issues in mathematics is how to make students interested in learning mathematics as well as finding the appropriate answer to mathematical issues. Regarding the descending numbers of mathematics classes in the final period to high school and diploma, there is a dire need to check the reasons for lack of interest and identify factors affecting the interest of the students. Therefore, the aim of this study is to identify factors influencing the increase in students' interest in mathematics. Many researches [3], [4], [12] have been conducted about different methods of teaching to enhance students' interest in mathematics. However, the mentioned researches have examined factors such as family, school, classroom environment, friends, acquaintance with the history of mathematics, etc. in encouraging students towards mathematics.

The main objective of this study is to identify factors and conditions that motivate and encourage students towards the math class and the factors that make this class an attractive and lovely one. Mathematics teachers or those who are connected with math believe that when we enthusiastically and interestedly attempt to find the solution of a math problem, in fact, we are unaware of the passage of time and all our attention is focused on finding a solution to the problem facing us. As such, it seems that effective factors contributing to advent and increase of interest in mathematics among students should be identified so that students are encouraged to enthusiastically find the solutions of math problems and hasten to math class instead of running away from math class.

## II. METHODOLOGY

With regard to the subject and purpose of the research, descriptive research method was used in this article.

### A. Statistical Population

The study population consisted of math teachers of different levels who were teaching math in the School Year 2012-2013 in Zahedan city. This population was selected using random sampling method.

### B. Sampling and Sample Size

Regarding the different high schools in Zahedan city, 85 math teachers who were teaching mathematics in first or second secondary school level in Zahedan city were selected using simple random sampling.

### C. Data Collection Methods and Tools

The required data was collected using a researcher-made questionnaire included a combination of closed and open questions. The questionnaire consisted of 15 five-option questions that consisted of 10 main questions. These questions required the respondents to express their ideas on the impact of each of the questions in increasing the students' interest in math. Furthermore, respondents may submit their views in front of each question.

Eighty-five questionnaires were distributed and 8 of them were returned. Of these, 77 questionnaires were completely

answered and, thus, were verifiable. In the questionnaires, respondents' information regarding the degree in which they were teaching math, math teaching qualification and experience were examined. The results were presented in Tables I-III.

TABLE I  
INFORMATION ON EDUCATIONAL LEVEL OF RESPONDENTS

Educational level	First Secondary	Second Secondary
Number of responding teachers	37	40

TABLE II  
INFORMATION ON EDUCATIONAL QUALIFICATIONS OF RESPONDENTS

Educational qualification	Associate diploma	B.A.	M.A.
N	4	54	19

TABLE III  
INFORMATION ON TEACHING EXPERIENCE OF THE RESPONDENTS

Teaching experience	Less than 10 years	10-20 years	20-30 years	More than 30 years
N	22	35	18	2

#### D. Validity and Reliability of the Questionnaire

Face validity of the questionnaire was confirmed consulting with Supervisor and Advisor professors as well as experts in the fields of mathematics and psychology. Furthermore, reliability was confirmed using Cronbach's Alpha (91/0).

#### E. Data Analysis

Regarding the questionnaires, the obtained data was analyzed using independent t-test.

### III. EXAMINATION OF THE QUESTIONS OF THE QUESTIONNAIRE

- The first question of the questionnaire: How much is the family's influence on increasing students' interest in math? Independent t-test was used to examine the above question. The results were presented in Tables IV and V.

TABLE IV  
PERCENTAGE OF RESPONSES TO FAMILY'S INFLUENCE ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	1	14	19	25	18	77
Percentage	1.3	18.2	24.7	32.5	23.4	100

TABLE V  
THE RESULTS OF T-TEST FOR FAMILY ROLE ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
Family	11.71	2.23	9	10.65	76	0.01

As the results in Table IV show, 3.1% of teachers believe that family has a very least impact on increasing the students' interest in math but 18.2% believe that family has a faint impact on this trend. Furthermore, 24.7% believe that there is a moderate relationship between family and students' interest in math and 32.5% believe that this impact is high. Finally, 23.4% of teachers believe that this impact is very high and robust.

The t-test results showed that the mean scores of teachers to impact of students' families on increasing their level of interest were 71.11 which were more than the hypothesis mean (9). This difference was calculated against t (65.10) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table V. Statistically speaking; one can conclude that family is highly effective in increasing the students' interest in math.

The t-test results showed that the mean scores of teachers to impact of the educational level of students' families on increasing their level of interest were 4 which were more than the hypothesis mean (3). This difference was calculated against t (65.10) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). Besides and regarding the condition in which one of the family members has had a degree in one of sub-branches of mathematics, the mean scores of teachers to impact of the latter criterion on increasing their level of interest were 3.92 which was more than the hypothesis mean (3). This difference was calculated against t (8.01) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). Regarding the impact of recourse to math teacher on increasing the students' interest in math, the mean scores were 3.79 which was more than the hypothesis mean (3). This difference was calculated against t (6.51) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table VI. Statistically speaking, one can conclude that the family's education level, qualifications and recourse to teachers are highly effective in increasing the students' interest in math.

TABLE VI  
THE RESULTS OF T-TEST FOR THE EFFECT OF FAMILY'S EDUCATION LEVEL, QUALIFICATIONS AND RECOURSE TO TEACHERS ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
Parents' level	4	1.00	3	8.77	76	0.01
qualification	3.92	1.01	3	8.01	76	0.01
to teacher	3.79	1.07	3	6.51	76	0.01

- The second question of the questionnaire: How much is the impact of school environment on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables VII and VIII.

TABLE VII  
PERCENTAGE OF RESPONSES TO THE IMPACT OF SCHOOL ENVIRONMENT ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	0	4	28	26	19	77
Percentage	0	5.2	36.4	33.8	24.7	100

TABLE VIII  
THE RESULTS OF T-TEST FOR THE IMPACT OF SCHOOL ENVIRONMENT ON  
INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
School environment	7.97	1.57	6	11.01	76	0.01
Class climate	4.08	0.93	3	10.18	76	0.01
Activities outside	3.90	0.88	3	8.91	76	0.01

As the results in Table VII show, 5.2% of teachers believe that school environment has a very least impact on increasing the students' interest in math but 36.4% believe that school environment has a moderate impact on this trend. Furthermore, 33.8% believe that this impact is high. Finally, 24.7% of teachers believe that this impact is very high and robust.

The t-test results showed that the mean scores of teachers to impact of class climate and activities outside the classroom on increasing their level of interest were 4.08 and 3.90 respectively which were more than the hypothesis mean (3). This differences were calculated against t (10.18 and 8.91) and degree of freedom values (76) and it was concluded that the values were significant at 99% level ( $p < 0.01$ ). Furthermore, the mean scores of teachers to impact of school environment on increasing their level of interest were 7.97 that were more than the hypothesis mean (6). This difference was calculated against t (11.01) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table VIII. Statistically speaking, one can conclude that the school environment is highly effective in increasing the students' interest in math.

- The third question of the questionnaire: How much is the impact of peers on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables IX and X.

TABLE IX  
PERCENTAGE OF RESPONSES TO THE IMPACT OF PEERS ON INCREASING  
STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	0	0	18	36	23	77
Percentage	0	0	23.4	46.8	29.9	100

TABLE X  
THE RESULTS OF T-TEST FOR THE IMPACT OF PEERS ON INCREASING  
STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
peers	4.06	0.73	3	12.77	76	0.01

As the results in Table IX show, 23.4% of teachers believe that peers have a moderate impact on this trend. Furthermore, 46.8% believe that this impact is high. Finally, 29.9% of teachers believe that this impact is very high and robust.

The t-test results showed that the mean scores of teachers to impact of peers on increasing their level of interest were 4.06 which was more than the hypothesis mean (3). This difference was calculated against t (12.77) and degree of freedom values

(76) and it was concluded that the values were significant at 99% level ( $p < 0.01$ ). The results have been presented in Table X. Statistically speaking; one can conclude that the peers are highly effective in increasing the students' interest in math.

- The fourth question of the questionnaire: How much is the impact of first grade math teacher in every educational level on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XI and XII.

TABLE XI  
THE RESULTS OF T-TEST FOR THE IMPACT OF PEERS ON INCREASING  
STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	0	0	19	37	21	77
Percentage	0	0	24.7	48.1	27.3	100

TABLE XII  
THE RESULTS OF T-TEST FOR THE IMPACT OF MATH TEACHER ON  
INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
First grades	12.76	2.21	9	16.21	76	0.01
Elementary first grade	4.42	0.69	3	17.87	76	0.01
Middle-school first grade	4.21	0.80	3	13.24	76	0.01
High-school first grade	4.14	0.90	3	11.15	76	0.01

As the results in Table XI show, 24.7% of teachers believe that first grade math teacher in every educational level has a moderate impact on this trend. Furthermore, 48.7% believe that this impact is high. Finally, 27.3% of teachers believe that this impact is very high and robust.

The t-test results showed that the mean scores of teachers to impact of Elementary, Middle and High school first grade teachers on increasing their level of interest were equal to 4.42, 4.21, and 4.14 respectively which were more than the hypothesis mean (3). This differences were calculated against t (17.87, 13.24, and 11.15) and degree of freedom values (76) and it was concluded that the values were significant at 99% level ( $p < 0.01$ ). Totally, the mean scores of teachers to impact of first grade teachers on increasing their level of interest was equal to 12.76 which was more than the hypothesis mean (9). This difference was calculated against t (16.21) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table XII. Statistically speaking, one can conclude that the first grade teachers in every educational level are highly effective in increasing the students' interest in math.

- The fifth question of the questionnaire: How much is the impact of size and appearance of math textbook on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XIII and XIV.

TABLE XIII  
PERCENTAGE OF RESPONSES TO THE IMPACT OF SIZE AND APPEARANCE OF MATH TEXTBOOK ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	2	1	25	26	23	77
Percentage	2.6	1.3	32.5	33.8	29.9	100

TABLE XIV  
THE RESULTS OF T-TEST FOR THE IMPACT OF SIZE AND APPEARANCE OF MATH TEXTBOOK ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
appearance textbook	3.87	0.97	3	8.03	76	0.01

As the results in Table XIII show, 2.6% of teachers believe that size and appearance of math textbook have a very low impact on increasing students' interest. Furthermore, 1.3% of teachers believe that this impact is low. Finally, 32.5% of teachers believe that this impact is a moderate one and 33.8% believe that this impact is high. Finally, 29.9% of teachers believe that size and appearance of math textbook have a very robust impact on increasing students' interest.

The t-test results showed that the mean scores of teachers to impact of size and appearance of math textbook on increasing their level of interest were equal to 3.87 which was more than the hypothesis mean (3). This difference was calculated against t (8.03) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table XIV. Statistically speaking, one can conclude that size and appearance of math textbook are highly effective in increasing the students' interest in math.

- The sixth question of the questionnaire: How much is the impact of previous math teachers' behaviors on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XV and XVI.

TABLE XV  
PERCENTAGE OF RESPONSES TO THE IMPACT OF PREVIOUS MATH TEACHERS' BEHAVIORS ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	0	1	14	30	32	77
Percentage	0	1.3	18.2	39	41.6	100

TABLE XVI  
THE RESULTS OF T-TEST FOR THE IMPACT OF PREVIOUS MATH TEACHERS' BEHAVIORS ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
previous teachers' behaviors	4.21	0.78	3	13.52	76	0.01

As the results in Table XV show, 1.3% of teachers believe that previous math teachers' behaviors have a low impact on increasing students' interest. Furthermore, 18.2% of teachers believe that this impact is moderate. Finally, 39% of teachers believe that this impact is high and 41.6% believe that this impact is very high.

The t-test results showed that the mean scores of teachers to

impact of previous math teachers' behaviors on increasing their level of interest were equal to 4.21 which was more than the hypothesis mean (3). This difference was calculated against t (13.52) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table XVI. Statistically speaking, one can conclude that previous math teachers' behaviors are highly effective in increasing the students' interest in math.

- The seventh question of the questionnaire: How much is the impact of doing activity in the math class on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XVII and XVIII.

TABLE XVII  
PERCENTAGE OF RESPONSES TO THE IMPACT OF DOING ACTIVITY IN THE MATH CLASS ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	1	0	10	30	36	77
Percentage	1.3	0	13	39	46.8	100

TABLE XVIII  
THE RESULTS OF T-TEST FOR THE IMPACT OF DOING ACTIVITY IN THE MATH CLASS ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
activity in class	4.30	0.79	3	14.32	76	0.01

As the results in Table XVII show, 1.3% of teachers believe that doing activity in the math class has a very low impact on increasing students' interest. Furthermore, 13% of teachers believe that this impact is moderate. Besides, 39% of teachers believe that this impact is high and 46.8% believe that this impact is very high.

The t-test results showed that the mean scores of teachers to impact of doing activity in the math class on increasing their level of interest were equal to 4.30 which was more than the hypothesis mean (3). This difference was calculated against t (14.32) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table XVIII. Statistically speaking, one can conclude that doing activity in the math class is highly effective in increasing the students' interest in math.

- The eighth question of the questionnaire: How much is the impact of conducting research related to mathematics, its application in daily life and other courses on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XIX and XX.

TABLE XIX  
PERCENTAGE OF RESPONSES TO THE IMPACT OF CONDUCTING RESEARCH RELATED TO MATHEMATICS, ITS APPLICATION IN DAILY LIFE AND OTHER COURSES ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	0	2	29	33	13	77
Percentage	0	2.6	37.7	42.9	16.9	100

TABLE XX

THE RESULTS OF T-TEST FOR THE IMPACT OF CONDUCTING RESEARCH RELATED TO MATHEMATICS, ITS APPLICATION IN DAILY LIFE AND OTHER COURSES ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
conducting research	3.47	0.77	3	8.46	76	0.01

As the results in Table XIX show, 2.6% of teachers believe that conducting research related to mathematics, its application in daily life and other courses have a low impact on increasing students' interest. Furthermore, 37.7% of teachers believe that this impact is moderate. Besides, 42.9% of teachers believe that this impact is high and 16.9% believe that this impact is very high.

The t-test results showed that the mean scores of teachers to impact of conducting research related to mathematics, its application in daily life and other courses on increasing their level of interest were equal to 3.74 which was more than the hypothesis mean (3). This difference was calculated against t (8.46) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table XX. Statistically speaking, one can conclude that conducting research related to mathematics, its application in daily life and other courses are highly effective in increasing the students' interest in math.

- The ninth question of the questionnaire: How much is the impact of studying the history of mathematics on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XXI and XXII.

TABLE XXI

PERCENTAGE OF RESPONSES TO THE IMPACT OF STUDYING THE HISTORY OF MATHEMATICS ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	2	3	38	25	9	77
Percentage	2.6	3.9	49.4	32.5	11.7	100

TABLE XXII

THE RESULTS OF T-TEST FOR THE IMPACT OF STUDYING THE HISTORY OF MATHEMATICS ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
history of mathematics	3.47	0.85	3	4.41	76	0.01

As the results in Table XXI show, 2.6% of teachers believe that studying the history of mathematics has a very low impact on increasing students' interest. Furthermore, 3.9% of teachers believe that this impact is low. Besides, 49.4% of teachers believe that this impact is moderate. Furthermore, 32.5% of teachers believe that this impact is high and 11.7% of teachers believe that this impact is very high.

The t-test results showed that the mean scores of teachers to impact of studying the history of mathematics on increasing their level of interest were equal to 3.47 which was more than the hypothesis mean (3). This difference was calculated against t (8.41) and degree of freedom values (76) and it was concluded that the value was significant at 99% level

( $p < 0.01$ ). The results have been presented in Table XXII. Statistically speaking, one can conclude that studying the history of mathematics is highly effective in increasing the students' interest in math.

- The tenth question of the questionnaire: How much is the impact of separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) on increasing students' interest in math?

Independent t-test was used to examine the above question. The results were presented in Tables XXIII and XXIV.

TABLE XXIII

PERCENTAGE OF RESPONSES TO THE IMPACT OF SEPARATION OF EDUCATIONAL CLASSROOM OF MATHEMATICS FROM THE MAIN CLASSROOM (WHICH IS DECORATED WITH CRAFTS CREATED BY STUDENTS THEMSELVES WITH REGARD TO MATH BOOK INCLUDING ARTICLE, WALL NEWSPAPER, FIGURES AND FORMULAS) ON INCREASING STUDENTS' INTEREST

Indicator	Very low	Low	Medium	High	Very high	Total
N	0	2	22	29	24	77
Percentage	0	2.6	28.6	37.7	31.2	100

TABLE XXIV

THE RESULTS OF T-TEST FOR THE IMPACT OF SEPARATION OF EDUCATIONAL CLASSROOM OF MATHEMATICS FROM THE MAIN CLASSROOM (WHICH IS DECORATED WITH CRAFTS CREATED BY STUDENTS THEMSELVES WITH REGARD TO MATH BOOK INCLUDING ARTICLE, WALL NEWSPAPER, FIGURES AND FORMULAS) ON INCREASING STUDENTS' INTEREST

Indicator	Mean	Standard deviation	Hypothesis mean	t	Degree of freedom	Sig.
separation math classroom of main classroom	3.97	0.84	3	10.14	76	0.01

As the results in Table XXIII show, 2.6% of teachers believe that separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) on increasing students' interest is low. Furthermore, 28.6% of teachers believe that this impact is moderate. Besides, 37.7% of teachers believe that this impact is high and 31.2% of teachers believe that this impact is very high.

The t-test results showed that the mean scores of teachers to impact of separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) on increasing their level of interest were equal to 3.97 which was more than the hypothesis mean (3). This difference was calculated against t (10.14) and degree of freedom values (76) and it was concluded that the value was significant at 99% level ( $p < 0.01$ ). The results have been presented in Table XXIV. Statistically speaking, one can conclude that separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) is highly effective in increasing the students' interest in math.

## IV. DISCUSSION AND CONCLUSION

The results of the study are presented in this section:

- *The first hypothesis: Family and pursuit of educational course of learning math can increase students' interest in mathematics.*

Regarding the obtained results, it can be argued that family plays a significant role in increasing students' interest in mathematics. Furthermore, the family's educational level, qualifications and recourse to teachers are highly effective in increasing the students' interest in math. These results are consistent with the results of a study conducted by Haji Mohammadi [10] who found that paying attention and establishing a sound communication between teachers and parents of students to diagnose educational and behavioral problems in math course could make the students interested in math. Similarly, Ebrahimi [6] found that the educational level of parents could play a significant impact on students' educational progress in terms of math. In a similar vein, Mirbalooch Zehi [7] diagnosed that the relationship between family and their association with schools could influence the creativity of students in math class. Finally, Khaje Mirza'ei [9] found that parents' socio-economic status, educational level, involvement and attitudes had robust impacts on the educational performance of students.

- *The second hypothesis: Providing suitable school environment, conducting mathematical intelligence contest and dedicating a separate classes for math teaching increase students' interest in mathematics.*

Regarding the obtained results, it is evident that class climate, doing activities outside the classroom as well as school environment can increase students' interest in math. Furthermore, separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) is highly effective in increasing the students' interest in math. These results are consistent with the results obtained by Rezvani [11] who found that exercising good morality, appropriate behavior of teachers, performance of simple sports in the classroom, playing group games, and, generally, making students fresh and happy could make students interested in math. Similarly, Balavandi [12] indicated that establishment of association of mathematician children could encourage students towards math.

- *The third hypothesis: The quality of teacher's teaching and behavior, activity of students while teaching at all educational levels (Elementary to High school) enhance students' interest in math.*

Regarding the obtained results, it can be argued that Elementary, Middle and High school first grade teachers play vital role in making students' interested in math. Furthermore, previous math teachers' behaviors and doing activity in the classroom have much impact on encouraging the students towards mathematics. These results are consistent with a study conducted by Zare [3] who concluded that using a variety of teaching methods, appropriate to the purpose of each lesson,

supporting auditory and visual memory, and fostering students' precision and attention in the form of purposeful games could be helpful in increasing the level of their interest in math and functional activities. In a similar vein, Adham [4] conducted a research and found some of the reasons for poor performance of students as: 1) unfamiliarity of some of math teachers with techniques and manners of teaching math, 2) Lack of specialized teaching methodologies in teaching math in elementary levels, 3) Lack of enough practice and neglecting of math workbook, 4) Students' unfamiliarity with the importance of math and ignorance of goal and scope of math in this level, 5) Disregard for the interests, motivations and intellectual abilities of the students when teaching mathematics. Furthermore, Adham [4] believed that teachers could remove these obstacles verily.

Similarly, Joosha'ei [5] attempted to address this field and enumerated such factors as teachers' required scientific and specialized knowledge, teachers' interest in math, teachers' interest in teaching, teachers' field of education, teachers' sense of accountability, students' activity and interest in the process of teaching and motivating students, as the most influential and effective factors affecting the quality of learning mathematics among high school students. Bahrami Moqadam [8] conducted a thesis and found that teachers' teaching methods, procedures and his/her behavior in the classroom had great impacts on educational achievement of students. Nouri [2] conducted a research and concluded that strengthening the students' skills and making them active learners could enable them to progress in mathematics.

- *The fourth hypothesis: Studying the history of mathematics, conducting research related to mathematics, its application in daily life and other courses are highly effective in increasing the students' interest in math.*

Regarding the obtained results, it can be argued that studying the history of mathematics as well as conducting research related to mathematics, its application in daily life and other courses are highly effective in increasing the students' interest in math. These results are in harmony with the results of a research conducted by Baqeri [13] who pointed to the benefits, importance and urgency of addressing the history of mathematics. Panasuk and Horton [14] indicated that the studying the history of mathematics had great impact on students' learning. Wang [15] showed that studying the history of mathematics had great impact on students' learning and teaching. Babai [16] conducted a research and found that studying the biographies of great mathematicians could increase the students' interest in math. Similarly, Joosha'ei [5] did a research and found that creating a research atmosphere and doing appropriate research projects could impact students' interest in math.

Therefore, one can conclude that the interest in learning is the product of a collection of factors including personality and ability of the student, the characteristics of assignments, incentives and other environmental factors. Motivated students are easily recognized. They are eager to learning. Furthermore, the motivated students are interested, curious, hard-working and serious. These students easily overcome obstacles facing

them. They spend more time for studying and doing homework. Besides, they passionately participate in classroom activities. Furthermore, they learn more materials and continue their education beyond high school.

Based on the results of the questionnaires in Chapter 4 and regarding their importance in opinions of math teachers in Zahedan city, it is possible to categorize the most influential and effective factors contributing to increase in students' interest in math as follow:

1. Doing activity in math class (activity of students while teaching)
2. Previous math teachers' behaviors
3. Separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas)
4. Peers
5. Size and appearance of math textbook
6. First grade teachers in each educational, among whom the Elementary first grade teachers had more importance and impact
7. School environment and appropriate class climate
8. The status of family and the educational level of their parents
9. Conducting research related to mathematics, its application in daily life and other courses
10. Studying the history and background of mathematics

Regarding the study results indicating that family, school environment, peers, math teacher, size and appearance of math textbook, previous math teachers' behaviors, doing activity in the math class, conducting research related to mathematics, its application in daily life and other courses, studying the history and background of mathematics, separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) are very effective in increasing the students' interest in mathematics, the following suggestions are presented thereof:

- \* Families are recommended to provide a safe and calm environment for their child to study and expect them as their talent permits them.
- \* Parents should attend school every two weeks and ask the relevant mathematics teacher about the educational progress of their child. As such, if their child is having trouble in mathematics, they can diagnose the problem and attempt to solve this problem.
- \* More attention should be directed towards holding thinking and coordination meetings with parents.
- \* We should try to decorate the math class by rafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas.
- \* More proper use of outer space should be exerted to teach mathematics better (field trips).
- \* Attention should be directed towards using a variety of math games to improve the attractiveness of our lessons.

- \* Students should do some research about the history of mathematics and its application in daily life.
- \* New revision of mathematical contents of math book that are not sequentially connected with each other as well as those lessons that have not paid attention to prerequisites for each lesson.
- \* Reducing the volume of mathematical book is a necessity because teachers are really obliged to resort to traditional methods of teaching to finish the lessons.

#### APPENDIX

##### Sample Questionnaire

###### In His name

Dear colleague; regarding the high importance of mathematics, the following questionnaire is designed to make use of your valuable experience in the form of a thesis entitled "how to increase the amount of students' interest in math". Furthermore, this thesis tries to assess the extent to which any of the foregoing factors can increase the interest of students in mathematics to make use of your ideas in order to raise the enthusiasm and passion of students in math. Consequently, we will try to lower the students' inadvertence towards mathematics and increase their interest in this important course.

###### A) Specifications of course and school:

..... girl/boy school

Regarding the current year, what levels are you teaching?

.....

Qualification ..... field of study.....work experience

..... mathematics teaching experience .....

If you wish, please mention your phone number.

**B) Please give your idea by specifying an option. If you require further details, please mention them against each question.**

**1. How do you evaluate the impact of family on increasing students' interest in math?**

**A) How do you evaluate the impact of educational level of parents on increasing students' interest in math?**

Very low  Low  Medium  High  Very high

**B) If one of the family members has had a degree in one of sub-branches of mathematics, how do you evaluate the impact of this factor on increasing students' interest in math?**

Very low  Low  Medium  High  Very high

**C) How do you evaluate the impact of direct contact between students' family and math teachers and asking for their children's educational status on increasing students' interest in math?**

Very low  Low  Medium  High  Very high

**2. How do you evaluate the impact of school environment on increasing students' interest in math?**

**A) How do you evaluate the impact of educational climate of math classroom on increasing students' interest in math?**

Very low  Low  Medium  High  Very high

**B) How do you evaluate the impact of carrying out activities outside the classroom, such as going to the yard and teaching mathematical materials there on increasing students'**



interest in math?

Very low  Low  Medium  High  Very high

3. How do you evaluate the impact of peers on increasing students' interest in math?

Very low  Low  Medium  High  Very high

4. How do you evaluate the impact of first grade math teacher on increasing students' interest in math?

A) How do you evaluate the impact of Elementary first grade teacher on increasing students' interest in math?

Very low  Low  Medium  High  Very high

B) How do you evaluate the impact of Middle School first grade teacher on increasing students' interest in math?

Very low  Low  Medium  High  Very high

C) How do you evaluate the impact of High school first grade teacher on increasing students' interest in math?

Very low  Low  Medium  High  Very high

5. How do you evaluate the impact of size and appearance of math book on increasing students' interest in math?

Very low  Low  Medium  High  Very high

6. How do you evaluate the impact of previous math teachers' behaviors on increasing students' interest in math?

Very low  Low  Medium  High  Very high

7. How do you evaluate the impact of doing activity in the math class on increasing students' interest in math?

Very low  Low  Medium  High  Very high

8. How do you evaluate the impact of conducting research related to mathematics, its application in daily life and other courses on increasing students' interest in math?

Very low  Low  Medium  High  Very high

9. How do you evaluate the impact of studying the history of mathematics on increasing students' interest in math?

Very low  Low  Medium  High  Very high

10. How do you evaluate the impact of separation of educational classroom of mathematics from the main classroom (which is decorated with crafts created by students themselves with regard to math book including article, wall newspaper, figures and formulas) on increasing students' interest in math?

Very low  Low  Medium  High  Very high

If there you think that there are some other factors that have not been mentioned above, please state them in this part.

**Thanks a zillion**

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