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Mathematical power and its relationship to mathematical culture among high school mathematics teachers

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Abstract:

The current research aims to know the correlation between mathematical power and mathematical culture for secondary school mathematics teachers, and the descriptive research approach was adopted to answer research questions. For data collection, two assessment was built first for the mathematical power which finalized into (10) assessment paragraphs in an article type and a test for mathematical culture. Its final form consists of (8) items of the article type as well. The sample consisted of (200) high school teachers from the General Directorate of Education for Rusafa (3). The results showed that teachers (male and female) possess the power of mathematics and mathematic culture. It also showed a positive correlation between the Research variables.

Keywords: mathematics, high school

I. Introduction

Several international organizations such as the American society for advanced sciences, National Council for mathematics teachers, mathematics teaching body on the importance of developing approaches, goals and methods of teaching mathematics (Al Saydawi, 16:2012), the power of mathematics was considered a standard for measuring the quality of teaching mathematics in schools, and it was found to be a new approach in supporting and aiding in the development of students as it is considered knowledge and what is beyond comprehension according to the (NCTM) script, with the emergence of mathematical culture which is regarded as a crucial part in human development (the secret,2005,2), obtaining mathematical culture helps the individual in resolving life problems also helps the individual to adapt with the society, moreover it increases the awareness of the importance of knowledge, thus, because of these changes the significance and the need to understand the correlation between studying and teaching mathematics emerged, therefore we can summarize the research problem with the following question:

Is there a relationship between the power of mathematics and mathematical culture for mathematics teachers in high school.

Importance of the research

It can be explained in the following:

1) Identifying the mathematical power and its dimensions for the math teachers in high schools

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2) Directing the attention of teachers to mathematical power since it's a global trend in teaching mathematics

3) A mathematics teacher's capability in the mathematical power aspect helps change the dry and abstract vision about mathematics and aims to connect it to students' daily lives.

4) Directing teachers' attention to the components of the mathematical power such as communication, interconnection, inference, and their importance to the students

5) Providing a test evaluating the mathematical power and awareness of teachers

6) Directing attention to the dimensions of mathematical culture through determining it's critical sides for mathematics teachers

7) Emphasis on the preparation and training department at the education directories to hold courses and training programs for math teachers regarding mathematical culture

8) Guiding researchers in mathematics teaching in public education to be interested in mathematical culture research and linking mathematics with daily life and other sciences

purposes of the research

The current research aims to the following:

-determining the dimensions of mathematical power and exploring its components for the math teachers in high schools

-defining the concept of mathematical culture and exploring its elements for high school math teachers

- determining the nature and the and direction of the relational relationship between mathematical power and mathematical culture for math high school teachers

research hypothesis

To validate the research, the researcher develop the following hypothesis:

1) There is no statistically significant difference (0.05) between the mean real performance and virtual performance for math high school teachers while taking the mathematics power test designed for this particular purpose.

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

2) There is no statistically significant difference (0.05) between the mean male math teachers grades and female math teachers grades for high school teachers undertaking mathematical power test designed for this particular purpose

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 = \mu_2$

3)There is no statistically significant difference (0.05) between the mean actual and virtual performance between male and female math high school teachers undertaking the mathematical culture test designed for this particular purpose

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

3) There is no statistically significant difference (0.05) between the mean grades of male math teachers and female math teachers undertaking the mathematical culture test designed for this particular purpose

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

4) There is no relational relationship between the mathematical power and mathematical culture between male and female math high school teachers at the level of significance (0.05)

$H_0: \overline{\mu_1 = \mu_2}$

$H_1: \mu_1 \neq \overline{\mu_2}$

5) There is no relational relationship between the mathematical power and mathematical culture for male math high school teachers at the level of significance (0.05)

$H_0: \overline{\mu_1 = \mu_2}$

$H_1: \mu_1 \neq \overline{\mu_2}$

7)There is no relational relationship between the mathematical power and (6 mathematical culture for female math high school teachers at the level of significance (0.05)

$H_0: \overline{\mu_1 = \mu_2}$

$H_1: \mu_1 \neq \overline{\mu_2}$

research limits

The research is determined by the following:

- High school mathematics teachers (middle school) in the general doctorate of Rusafa education
- High school mathematics teachers (middle school) in the general doctorate of third Rusafa education
- The first semester for the year 2019-2020

defining terms

Mathematical power defined as (NCTM,1989): The maximum in math medical knowledge that can be used to think and communicate mathematically and in life

(NCTM,1989:205-208)

The researcher defines it partially for this research as the capability of math high school teachers to answer the questions of mathematical power that are prepared according to specific standards. The final result determines what they obtain.

Mathematical culture defined as (Gresswell & Sophie, 2006): "the ability of the individual to define and understand the role that mathematics plays to the world, and the ability to make sound judgments, and using mathematics in ways that meet the needs of individuals for life." (Gresswell &Sophie, 2006:72).

The researcher defines it in this research as being the ability of high school mathematics teachers to answer the mathematical culture test that is designed based on its four dimensions, and it's measured by the grade they obtain.

II. Background of hypothesis

Concept of mathematical power:

The National Council of mathematics teachers of the United States of America considered the mathematical power (NCTM,1989) to determine the levels of knowledge and mathematical operations in students, and considered it the fourth standard Mathematical calendar.

(NCTM, 1989:205-208) and it suggested (AAEP,2003) a structural chart considering it a 3D matrix as it is composed of three dimensions which are the mathematical knowledge that shows the students capabilities within three dimensions as

well (conceptual knowledge, procedural knowledge, and problem-solving) and how they are used in mathematical reasoning, mathematical communication and their relations with other topics. (Al meqdad, 2014: 334)

The mathematical power enables students to express their mental perceptions with drawings, tables, and diagrams and to use symbols and vocabulary to clarify them, and enables them to create a language format for these symbols and vocabulary and use them in writing or orally through discussions and scientific presentations. Mathematical power demonstrates a students' ability to perceive inter-linkages within levels of knowledge and between areas of mathematics, and the relation of mathematics with other subjects, this document the student's perception of the utility of mathematics and its usefulness and here he has an image of the beauty of mathematics which is the other side of mathematical power . (Omar 2015:3).

And both the national center for educational statistics and the national foundation for educational achievement in America (NAEP,2000) indicated that mathematical power s enable us to measure the performance of a student and his ability to employ mathematical knowledge at its three levels (conceptual, procedural and problem solving) with the dimensions of operations with its three levels (mathematical communication, mathematical bonding, and interference) this capability appears by solving familiar problems by solving familiar and unfamiliar problems. (NAEP,2000:2) (NCES,2002: 2).

Document issued by the National Council of mathematics teachers also affirmed that the performance of students should be developed by employing mathematical knowledge by exploring, guessing. Logical thinking to solve non-routine problems and communicate in the language of mathematics in all its branches, or linking it to other subjects of science that have to do with what the student studies in mathematics and shows the students ability to express drawings and shapes in the use of mathematical symbols and his ability to communicate at the level of procedural knowledge in solving and discussing familiar problems, The mathematical power also shows the student's ability to manage the interconnections within the standards of expertise and branches of mathematics and other sciences (Al Saidawi,2012:19) and these links are with an appropriate content in which the first two dimensions are shown in it (Obaida,2006: 54-53).

III. Mathematical power dimensions

Mathematical power has three main dimensions, and there are levels for each dimension, as shown:

First dimension: mathematical knowledge which consists of three levels

A. Conceptual understanding: The student's ability to understand concepts and generalizations and has a relationship with learning content.

B. Procedural knowledge: The mathematical procedures required by the learner algorithm are mentally and technologically and have a relationship with how to learn

C. Knowledge associated with problem-solving: here, the two former types are linked and employed to solve problems.

(Al Muqeed, 29:2017-30)

Second dimension: mathematical operations and it has three levels as well:

A. Mathematical communication: in the ability to process treatments of conceptual knowledge and translated into symbols and indications, the use of mental and technological performance is expressed by expressing procedural knowledge in the light of the data the problem is formulated to be discussed and solved.

B. Mathematical interlinkage: in its conceptual and procedural knowledge, ideas and mathematical topics are linked together with each other and with other sciences. In students, daily life and connections are used to solve mathematical problems

C) mathematical inference: in it the ability to extrapolate generalizations and laws regarding concepts, make algorithms, judge their regions, estimate reasonableness of procedures and procedural knowledge and make judgments about addressing and solving problems. (Al Qubailat and Ahmed, 2014:335)

Third dimension: content and it involves the following:

A. Operational numerical sense
B. Measurement and the sense of measurement
C. Engineering and spacial sense
D. Relationships and models
E. Data and probability concepts
F. Algebra and algebraic functions

(Aser,2006:2)

Mathematical power improvement goals

(Machini & Calvin,2002) both clarify that The national Council of mathematics teachers formulated school mathematics in the light of future aspirations which aims to build a person distinguished by mathematical power in light of the following main goals so that the student will be able to:

- ✓ Communication using mathematics
- ✓ Realizing mathematical interlinkages
- ✓ Mathematical inference
- ✓ The student realizes the importance of mathematics
- ✓ Students trusting their mathematical skills

(Machini & Calvin, 2002: 326)

(Gerald & Scouts,1991) both referred to the fact that if we wanted to improve the mathematical power, we need to abide by those three dimensions:

1- What does the student think about mathematics: what is meant here is the necessity of changing the student's traditional view of mathematics and limited to the arithmetic operations of numbers but rather extends to other processes and activities including estimation, information discovery, planning determination of the course of work and imagination

2- What the teacher thinks regarding teaching mathematics: it is intended to change the teacher's belief that teaching is merely a transfer of experience, but it is, in fact, purification of a path, and he must understand that there are strategies and practical activities the application of real-life scenarios and problems.

3- Student activities: in this, we must focus on the student's actions, which include the use of tools, focuses on relationships, and asks questions and not overburden the student with complex mathematical operations.

(Gerald&Scouts,1991:1-14)

Math strength is characterized by the ability to define multiple patterns of knowledge and mathematical operations according to the following Table:

Table(1):

Table (1) matrix illustrating the dimensions of mathematical strength

Problem-solving			Procedural knowledge			Conceptual knowledge			Major and Minor capabilities	
Reasonableness of	Solution and interpretatio	Problem Formulation	Technological	Mental performance	Algorithmic Performance	Wording	Conclusion &	Resolving concepts	Operations and patterns	
									Mathematical Examples	Mathematical communication
									Mathematical Listening	
									Mathematical Discussion	
									Mathematical Reading	
									Mathematical Writing	
									Structural correlations	Mathematical association
									Interconnections	
									Structural Correlations	
									Integrative correlations	

									Conclusion	Mathematical reasoning
									Induction	
									Prediction	
									Evaluate	
									Relational	

It is found in studies of education in mathematical power as the study(Ryani,2012) and (Hlewa,2015) and (Al muqeed,2017), they used this matrix to determine the levels of each dimension of mathematical power by intersecting the rows and columns of the matrix.

Mathematical culture

The concept of culture:

British anthropologist Edward Barnard Taylor has expressed an idea of culture as the whole complex, including the knowledge, beliefs, art, ethics, and costumes that a person acquired as a member of society; for him, culture expresses the individual's social life and group coexistence. He clarifies that culture is obtained and does not come from biological inheritance) cos.(2007:31،

(Al leqaai and Ouda,1989) It is clear that culture is the fabric and the part of the environment that the human-made and treasured over time with his experience in the light of the development of life. It is the legacy of the experience, and what distinguishes a society from another it has been divided into three sections:

1. Generalities: many individuals are involved with it such as language, uniform and celebrating certain events and it provides the authentic touch to culture
2. Privacies: this belongs to a specific group of society members such as members of one profession or particular class in society. It is characterized that the members of the rest of the community have an idea about it.
3. Variables or alternatives: this is the result of developments in modernity and mixing with the cultures of other societies; it is not within the different sections of culture. It does not continue to disappear and end. (Al Qanii and ouda, 1989:36)

The culture has varied in the fields of life, including the scientific culture. This research deals with the mathematical culture.

Mathematical culture

Mathematics is an essential part of human civilization and is a significant component of society's culture over the decades. This culture was and still is a vital assistant to the individual is facing and adapting to social and contributing to the development of the individuals scientific thinking (Ibrahim,41:200)

Mathematical culture means taking mathematics out of the school framework, linking it to the daily life of the individual communicating in mathematics, evaluating other mathematical thinking, and showing the beauty of mathematics. (Braun,2018:20)

(Abu Asaad,2010) emphasizes that one of the common goals of teaching mathematics is to introduce students to the importance of mathematics, and it's a role in developing society. (Abu Asaad,2010:39).

A mathematics teacher's mathematical culture differs from an ordinary individual who needs mathematical skills that enable him to interact within society to facilitate his life. However, mathematics teachers differ because they need a robust mathematical background regarding the facts, concepts, theories, and skills. He requires specific skills to apply in the real environment to remain in the learner's cognitive structure. It shows him the aesthetic aspects of mathematics and the extent of benefiting from them in their daily lives to face the problems they encounter to make the appropriate decision in life situations. (The secret, 2005:4)

The question that arises strongly is whether the programs for preparing mathematics teachers in colleges of education are competent to teach mathematics and help develop a mathematical culture among teachers so that they can improve it among students?

Many studies worldwide have shown that most students rejected mathematics because of this fear; global trends have emerged, calling for the development of mathematics teaching methods and linking them to students' lives.

Dimensions of mathematical culture

(Jaber Waeel, 2007:24) specified four dimensions for mathematical culture:

1. Mathematical culture linked to language
2. Mathematical culture related to other sciences
3. Mathematical culture linked to life
4. Mathematical culture linked to the history

The researcher will depend on those dimensions in designing the test regarding mathematical culture

Previous studies

The researcher tried obtaining previous studies that suit the search variables to benefit from them while making a comparison with what was accomplished. The following is a summary of those studies:

Table (2)
Studies regarding mathematical culture and mathematical power

Name of researcher, year and country	Purpose of study	Educational level	Size and gender of sample	Curriculum type	Study Management	Subject	Important results reached by study
Al-ser,2005, Palestine	Knowing level of mathematical culture among students of the faculty of education at Al Aqsa university	College	46 male and female students	Quasi experimental	A questionnaire for the trend towards mathematics and a test for mathematical culture	Mathematics	The results showed that there is no relationship between the trend towards mathematics and mathematical culture and that there is an effect of the trend in acquiring mathematical culture for those with a high average
Yong Li and He Huang,2011, China	Knowing the importance of mathematical culture by analyzing data	College	Non	Descriptive	Questionnaire	Mathematics	The results showed that students are interested in mathematics It can be stimulated by sports culture and, sports culture contributes to the formation of Mathematical thinking for students
Al Sedawii,2012 Iraq	The effect of a program based on mathematical power of applicants in the mathematical power of their students and their achievements	Fourth stage College students, 7,8th grade students	100male and female college students , 23 male and female intermediate grades	Experimental	Mathematical power test for applicants A test of mathematical power for middle	Mathematics	The results showed that students are interested in mathematics It can be stimulated by sports culture and, mathematical culture contributes to the formation of Mathematical thinking for students

			students		school students And two achievement tests for the first and second are medium		
Omar,2015, Palestine	Knowing the effect of a program based on mathematical power on student achievement	7^{th} grade	60 male and female students	Experimental	Mathematical thinking test and achievement test	Mathematics	The results showed that there are statistically significant differences for the experimental group and for both tests
Kusmaryono &H.Suyitno, 2015 Indonesia	Approval of teaching mathematical power according to the constructivist theory	4^{th} grade	Male and female students	Descriptive	Note card and interviews	Mathematics	The results showed the importance of adopting the teaching of mathematical power based on constructive theory
Dawood and Sundos, 2018	The effect of the Ideal model on achievement and mathematical culture	Intermediate grades	48 male students divided into 2 groups	Experimental	Achievement test A questionnaire for mathematical culture	Mathematics	The results showed that the experimental group was superior in achievement and model effectiveness in the mathematical culture scale

I.

IV. Research methodology and procedures:

First- methodology: the descriptive research method was adopted, which focuses on investigating one of the phenomena as they exist at present to diagnose them, reveal their aspects, and determining the relationships between their elements or between them and other events.

Second-research society: the research community consists of all the male and female high school mathematics teachers in the general directorate of education or Rusafa (3).

Third-research sample: (200) male and female teachers were chosen randomly from the directorates teachers.

Fourth-tools of the study:

Mathematical power and mathematical culture tests

1. Defining the concept: After examining the literature, the concept of mathematical power was defined and a matrix was used to determine the levels of each dimension of mathematical power , and the researcher considered it as a guide for building the mathematical power test through the intersection of the rows and columns of the matrix. Also, the concept of mathematical culture was defined and its dimensions adopted in building the test.

2. **Preparing the paragraphs in their original form:** Depending on the proposed matrix, the test was constructed, the construction of which was based on general mathematical information for the teachers according to their suitability and in its first form of (10) paragraphs of the artical type. A mathematical culture test was built for two questions for each dimension, so the test consisted of (8) paragraphs of the artical type.

3. Preparing test constructions: instructions for the two exams were laid down. The teachers were asked to read the paragraphs well, and all items must be answered if a paragraph is left unanswered. The error is calculated, and the scores for this test are for scientific research.

4. 1- **Presenting the tests to the judges:** The experiments were presented to a panel of judges in the field of mathematics and its teaching methods to ensure the validity of the test items, some adjustments were made to be appropriate for the teachers, and an agreement was reached (80%), and the tests became ready for exploratory application.

5. **- Exploratory application:** To know the clarity of the paragraphs of the tests and to understand them and the clarity of the answer instructions and to calculate the time taken to answer, the mathematical power test was applied to a sample consisting of (40) teachers and schools from the research community and without the research sample, and the paragraphs were clear to the teachers and the time spent in answering was calculated By calculating the weighted mean between the first and the last three teachers who performed the test, and it became clear that (60) minutes is sufficient, as applied to the mathematical culture test, and after calculating the time it turns out that (45) minutes is sufficient

6. **Correction of the test**: The test was corrected according to the test paragraphs' division of grades for each question (5) degrees, while the second test corrected each item of (6) degrees

7. Statistical analysis of the paragraphs:

To obtain statistical indicators to examine the tests, the following steps were followed:

- After the correction, the teacher and school's total score was determined on the tests, and the grades were ranked in descending order.
- Determine what represents the highest (50%) and what constitutes (50%) of the lowest scores.
- After calculating the correct answers, the following statistical analyzes were performed:

8. Statistical analysis of the paragraphs

To obtain statistical indicators to examine the tests, the following steps were followed:

A-Calculating the discrimination factor for each of the first test paragraphs by adopting the equation for essay questions and found that their value ranges between (0.30 - 0.65), while the second test indicators were (0.27 - 0.72).

B-Calculating the difficulty coefficients for the article paragraphs and the results ranged between (0.25-0.60) and (0.31-0.75).

Indicators for excellence and difficulty coefficients are acceptable.

Psychometric properties extract:

8-1- validity: The tests were presented to several arbitrators in mathematics specialties and teaching methods and to get their opinions. The paragraphs in their final format received 80%; therefore, all test paragraphs were considered viable.

8-2- Reliability: Intentionally, the stability was extracted using the Alpha Cronbach equation, which is suitable for both substantive and article paragraphs. The balance was (0.73) and (0.78) for the second test.

Thus, the tests are ready to be applied to the research sample in its final form.

V. Results:

To achieve the research aims and to answer its hypotheses, the data were analyzed to know the significance of the statistical differences between the mathematical community using the statistical bag (SPSS). The results related to the research hypotheses will be presented and explained in light of what has been reached.

Results regarding mathematical power :

(Table3)

Second test results for one sample for mathematical power test

Indication	t-test calculated tabular	CALCULATED VALUE t-test	HYPOTHETICAL	STANDARD DEVIATION	SMA	Sample size

			MEDIUM			
Significant	1.96	33.11	25	5.37	37.59	200

It is noted from the above table and a comparison of the calculated t-test value with its tabular value. It is clear that secondary school mathematics teachers have athletic strength, and the T-test was conducted to compare male and female teachers. The results showed no statistically significant differences between the two and the table (4) shows that:

Table (4)

t-test of two equal independent samples to test mathematical power between male and female teachers of mathematics

SIGNIFICANCE LEVEL	T VALUE		STANDARD DEVIATION	VARIANCE	SMA	Amount	Sample
	tabular	calculated					
UNSIGNIFICANT	1.96	0.52	5.13	26.31	37.77	100	FEMALE TEACHERS
			5.60	31.36	37.37	100	MALE TEACHERS

RESULTS REGARDING MATHEMATICAL CULTURE:

A t-test was conducted on the research sample of female teachers and teachers, and the results showed that they possessed mathematical culture, and the following table shows that:

Table(5)

T-test results to measure the difference between average and pure performance in a mathematical culture test

SIGNIFICANCE	TABULAR t-test VALUE	CALCULATED t-test VALUE	HYPOTHETICAL MEDIUM	STANDARD DEVIATION	SMA	Sample size
SIGNIFICANT	1.96	30.11	24	4.71	34.05	200

(198) Degree of freedom

To find out if there were statistically significant differences between the performance of teachers and the performance of female teachers on the mathematical culture test and prepared for this purpose, a t-test was conducted for two equal samples, and the result was in favor of female teachers as shown in the following table:

Table(6)

The t-test of two equal independent male and female teachers on the mathematical culture test

SIGNIFICANCE LEVEL	T VALUE		STANDARD DEVIATION	VARIANCE	SMA	Sample numbers	Groups
	tabular	calculated					
SIGNIFICANT FOR FEMALE TEACHERS	1.96	3.37	4.50	20.25	35.03	100	FEMALE TEACHERS
			4.88	23.81	32.79	100	MALE TEACHERS

.(198) Degree of freedom in favor of females

Results related to the relationship between mathematical power and mathematical culture among male and female teachers

To find out if there is a correlation between the mathematical power and the mathematical culture of male and female teachers, a Pearson correlation coefficient was used to calculate the value of the correlation coefficient between the grades of male and female teachers in the two exams, as shown in table (7).

Table(7)

Correlation coefficients between mathematical power and mathematical culture And the significance of correlation among the study sample

Correlation T function	Correlation coefficient Value	Relationship
7.006	**0.674	Mathematical power Mathematical Culture
3.38	**0.647	Relation between females
5.906	**0.713	Relation between males

Note that 1.96 is the tabular T value at the significance level of 0.05 and the degree of freedom (198)

VI. Explaining results

From observing the results that appeared in the previous tables, it became clear that high school teachers and mathematics teachers possess mathematical power . From comparing male performance with a female performance for the same selection, it was found that there were no statistically significant differences. The reason may be that teacher preparation programs in colleges of education have many numbers and indicators of mathematical power. This is confirmed by the absence of statistically significant differences between them. The results showed that the male and female sample owns the mathematical culture, and this is a good indicator, which means that the teacher preparation programs are useful in colleges of education. Still, the comparison of teachers' performance with the performance of female teachers in the mathematical culture test showed statistically significant differences in favor of female teachers.

From observing the results that appeared in the previous tables, it became clear that high school mathematics teachers possess the mathematical power . From comparing male performance with a female performance for the same selection, it was found that there are no statistically significant differences. The reason may be that teacher preparation programs in colleges of education have many numbers and indicators of mathematical power This is confirmed by the absence of statistically significant differences between them. The results showed that the sample owns the two sexes for mathematical culture. This is a good indicator, which means that the teacher preparation programs are useful in colleges of education. Still, the comparison of the performance of teachers with the performance of female teachers in the mathematical culture test showed statistically significant differences in favor of female teachers.

The reason may be that the dimensions of mathematical culture and what it contains from a historical aspect or a link with other sciences or life is closer to female teachers because of their communication with the study of their children and various subjects.

The results also showed that there is a reliable and positive correlation between mathematical power and mathematical culture among male and female teachers, and there is also a strong and positive correlation between male and female teacher performance alone.

VII. Conclusion:

1- Difficulty conducting studies and tests for teachers because they do not accept.

2- The difficulty of linking mathematics subjects with the natural sciences or daily life.

VIII. Recommendations:

In light of the current research results, the researcher recommends the following:

1. Go to curriculum designers in the Ministry of Education to review mathematics curricula to include the dimensions of mathematical power and the aspects of mathematical culture.

2. Holding courses to train teachers on modern strategies concerned with linking mathematics to daily student life and other sciences.

3. Training teachers to remove the mathematical culture and focus on the mathematics culture in students' daily lives.

IX. SUGGESTIONS:

To complement the current research, the researcher suggests the following:

1- Conducting an experimental study of the same variables on the applied in colleges of education.

2- Conducting a trial study for the teachers and knowing the effect upon their request.

3- Building an instructional design based on mathematical power in dimensions of mathematical culture.

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