

The Role of Mental Vitality in the Mathematical Performance of Public and Magnet School Students Based on the Professional Competencies of Teachers

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Abstract

Background: The development of mathematics in any society can pave the way for the development of other scientific and industrial disciplines in that society. Successful classroom management is an essential prerequisite for effective teaching. Objectives: The purpose of this study is the role of mental vitality in the mathematical performance of normal and sample school students based on the professional competencies of teachers and also their comparison. Design: The present study is an applied research. Setting and Participants: The available sampling method has been used that 140 students of secondary schools in Golestan province have been selected in different grades and among girls and boys. Data collection and Analysis: The mathematical performance of normal and exemplary school students was evaluated based on the professional competencies of teachers and their relationship was examined using the Ryan & Frederick, Mental Vitality Questionnaire. In order to analyze the data, two sections of descriptive and inferential statistics were used. In the descriptive statistics section, mean, standard deviation, tables and in inferential statistics section, statistical hypothesis tests, community t-test and correlation coefficient test were used. Results: According to Levin test, because F statistic is 0.089 with a significance level of 0.776, ie more than 0.05, so the equality of variances is established, so we use the first line for analysis. Now, using independent t - test, the statistical value of this test has been calculated at a significant level of 0.05 equal to -2.692 using SPSS software. Due to the fact that the level of significance of the test is less than 0.05, it can be said that there is a significant difference between the mental vitality of students in normal and sample schools and this variable is more in sample schools. Conclusion: The results show that the more professional qualifications of teachers are developed, the more mental vitality among students and their performance in mathematics will be better. Therefore, in this study, students from sample schools with higher vitality performed better in mathematics.

Keywords: Professional competence, Math teachers, Mental vitality, Math performance.

INTRODUCTION

Mathematics is the finding of solutions to problems and science that studies the numbers, shapes, objects, and ratios required by all sciences, and includes techniques for answering

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quantitative problems. One determines the level of accuracy of one's decisions, which means that a person can perform well in the comprehensive when he has a good knowledge of mathematics, especially in the information age (Aghazadeh, 2007).

The development of mathematics in any society can pave the way for the development of other scientific and industrial disciplines in that society. Basic mathematical skills are very important for success in school and daily life, and in fact mathematics is one of the most important - The most basic individual skills in the continuity of life in modern societies (Karimi, 2022). Mathematics is one of the subjects that has a special place in schools. Understanding mathematics is usually considered as a matter of course in terms of career success and effective personal management in daily life, so in elementary school, middle school and higher education in mathematics It is considered a vital lesson (Bessant, 1995).

The learning, teaching and widespread application of mathematics in everyday life has become an important global priority for students and teachers. Mathematics as "Scientific Relationships Between Numbers, Space and Shapes, and Language Related to Symbols, All Used by" (Goya, 2021), quoted by (Javanmardi, 2021).

Successful classroom management is an essential prerequisite for effective teaching. Facilitating the classroom for active and effective learning is a complex and difficult skill that the teacher must learn and constantly increase his / her knowledge in this regard. Classroom management may be the only management that plays a choice of several roles simultaneously, such as classroom management, person management, place management, time management; Course management, co-operation in school management, co-operation with families, liaison management and the inevitable performance of these roles naturally motivate all sections of society to have high and varied expectations of the teacher. Becoming a professional in any job has its own rules. The teaching profession is no exception to this rule.

THEORETICAL BACKGROUND

Students' Performance

Mathematical behavior refers to how a person's mathematical knowledge is manifested in different situations that are influenced by internal and external factors. Internal factors (perceptions and attitudes to mathematics, gender, mental preparation) and external factors (characteristics of a mathematics teacher, how to evaluate and succeed in mathematics, characteristics of the class, family, cultural and economic conditions, etc.). Can play the role of facilitator or inhibitor of mathematical behavior (Deci & Ryan, 2000).

Mathematics is one of the courses in which proper performance has always been and is of great importance for students and their parents. Perhaps this significance has a historical aspect; Because mathematics has been considered as a basic science and used in everyday life in human history and civilization. So far, millions of people have lost their educational and professional opportunities due to their poor mathematics and performance in this field. They had a fearful background. They had negative experiences with learning math during school, the memory of which is preserved in the later years of life.

The interference of negative emotions resulting from these experiences with the information they had in the field of mathematics has led to a lack of understanding of mathematics (Raufi, 2022), quoting (Raouf, 2020). High progress in mathematics is important for entering many universities and special fields. Mathematics is considered as a measure of overall academic achievement, intelligence and competence. Mathematics is also the basis for the development of science and technology disciplines, which require

skills in the basics of mathematics to understand and pursue studies in engineering, physics, or computer science. Due to the great impact of mathematics in our daily lives, mathematics has been the main focus of the educational system and in it the progress of students is monitored and their understanding of mathematics is emphasized (Mousavi et al., 2017).

Despite the importance of mathematics, the results of research indicate the weakness of students in this field of study. In general, the poor performance of Iranian students in the field of mathematics is rooted in several factors and variables that make it difficult to teach mathematics. Obviously, proper education and academic achievement in mathematics requires identifying the problems that exist in the way students learn in this course. They are thought to be on the path to learning mathematics or origins in mathematics or extra-mathematics. Extra-mathematical problems are either intrapersonal or extrapersonal. Students' external problems originate in mental processes, learning, beliefs, motivations and attitudes, while external problems are influenced by cultural, social, educational factors, learning environment, teaching and teachers' attitudes (Pachana & Laidlaw, 2014).

Mental Vitality:

Today, everyone agrees that human success depends not only on having healthy genes with access to health resources, but also on how people actively regulate their lives and behaviors, so that it improved well-being (Pachana & Laidlaw, 2014). The concept of well-being, of which mental vitality is one dimension, has a complex structure that relates to optimal performance and performance (Deci & Ryan, 2000). Psychological well-being includes three dimensions: happiness and purposefulness and vitality (Deci & Ryan, 2000). Ryan & Frederick, have described mental vitality as being full of energy, enthusiasm and well-being, not tiredness, and have shown that when mental vitality is low, irritability and fatigue appear and one does not use all one's strength to do life's work. In contrast, when there is a lot of mental vitality, enough energy is available to do activities and the mood is good and homework goes well (Ryan & Frederick, 1997).

Therefore, mental vitality indicates the existence of a lot of positive psychological energy and a lively person is full of life. They actually interpret vitality as energy that emanates from itself, and they see it as a feeling of energy whose source is internal, not specific environmental threats. According to them, mental vitality is different from mania, because vitality is the feeling of being fresh and energetic, not being forced and guided. Therefore, mental vitality is a manifestation of mental health and well-being, while mania is associated with distress and mental breakdown (Arabzadeh, 2017).

Framework for teacher knowledge for technology integratio

The basis of our framework is the understanding that teaching is a very complex activity that requires the use of different types of knowledge. Teaching is a complex cognitive skill that occurs in a morbid structure and dynamic environment. There are many knowledge systems that are basic in teaching, including students' thinking knowledge and learning and subject knowledge. Historically, basic teacher knowledge in education has focused on teacher content knowledge. Recently, education has shifted its focus to teacher education.

In all developed and developed countries, the teacher is considered a very sensitive and high-ranking job. The social, economic and cultural future of any country depends on the children of today and the men and women of tomorrow. For this reason, these countries have special plans for children's educational planning.

Economic, social, and cultural changes in society not only affect the world around the teacher, but also change the students, teachers, and the tools and equipment used for teaching.

One of the important factors and main reasons for students' academic achievement is the quality of teaching methods and other professional skills and competencies of teachers. In the learning community, teachers are the most important potential asset, so it is essential to pay attention to the development of their professional competencies.

Empowering people means encouraging people to be more involved in the decisions that affect their performance; It means providing a space for people to come up with good ideas and put them into action. Empowerment is a vital element of business in the new world.

Teacher competence is a set of cognitions, attitudes and skills that a teacher can acquire during education to help the physical, intellectual, emotional, social and spiritual development of learners. (Karimi, 2013, p. 38)

Many education experts believe that the teacher plays a major role in the educational process and therefore should have special conditions, such as: be a perfect model and example of life realities, be an expert in their field. To be a partner of God in the development of human personality, to be a master in the art of life, to be an ambassador of progress and development, to be a builder of democracies, to be constantly learning and to interact and understand with students

Education in the third millennium

The present age is called the information society because economic and political development has accelerated with the development of new technologies. These factors also affect schools and education.

Human education has been important since its inception, but at present, education is the key to the development of societies. And the prosperity and success of nations depends on the quality of education and training.

The real school has become a virtual school, the result-oriented has become a process-oriented. Decision-making has shifted from theory-based to information-exploitation strategies and top-down strategies to bottom-up strategies.

Teacher

In Amid Persian culture, the teacher is equivalent to words such as: teacher, learner and teacher. In Dehkhoda dictionary, teacher means learner, teacher and teacher. In the Culture of Behavioral Sciences, Sha'arinejad offers two definitions of the word teacher: a person who has been hired to teach a certain number of students in an educational institution; a person who has completed a teacher training course.

But the most recent definitions of a teacher are:

- a. A teacher is a person who interacts with one or more students or learners and his goal is to make a change in the existence of the learner, this change in any way is created by the teacher as a purposeful educational change and It is educational.
- b. A teacher is a person who, due to his close relationship with students, can identify their needs and according to that, he leads the learning process by organizing the educational materials as an educational leader in the classroom. He can increase students' knowledge by ultimately directing them to learning and ultimately perfecting them.
- c. A teacher is someone who thinks about the healthy growth and development of his students' personalities and meeting their spiritual and psychological needs. Or a teacher is someone who first of all considers himself a student who is thirsty for learning and spends every moment of his life in education, he should consider himself a student or an educator rather than a teacher. Madame Al-Omar (Fahim Koosha,2010)
- d. Karimi (2008) considers the teacher as one of the key components of the education system and the shortcomings of other components are also effective in this

component and it is necessary to pay attention to the most key component of the educational system and improve his knowledge, attitude and skills.

Teacher status in ancient Iran

In ancient Iran, the teacher played the most important role in the organization of society through the education of novices and children of the community. For this reason, it has been extremely popular, respected and given special attention. Teachers were the most important and surest means of transmitting the civilization, culture and knowledge of the past to future generations.

The position of the teacher was as great as that of the teacher in Avesta, Zoroaster. As stated in Yasna: "Zarathustra was a teacher of truth and spread the idea of truth in the world. "That's why he was given a pleasant speech."

Teacher status in the new age

Today's society is moving from providing compulsory education to focusing on the quality of education, and new curriculum reforms emphasize the development of learners' skills, learning how to learn, curriculum development, and the use of a variety of teaching strategies. Such changes require a change in the role of the teacher. (Lee et al. 1, 2003).

Teachers should reflect their insights on good teaching as a practice guide. To understand different social contexts, teachers need to understand their content, education, inclusiveness, and how they grow, and they need to expand their search for new approaches to teaching.

New technologies require new roles for teachers, pedagogies, and new approaches to teacher education. Successful integration of ICT in the classroom depends on the ability of teachers to build a non-traditional learning environment, participatory encouragement and active classroom creation, group learning and teamwork.

Learning for a New World Order

Educational systems must change in order to keep pace with the vast changes that have swept across human societies. If this is to happen, what path should future education take? Education provides an opportunity to cope with social change.

What has so far imposed itself on humanity around the world is a kind of educational system that reads only with the industrial needs of each country. Such a system is incapable of cultivating any kind of creativity and cannot create an enthusiasm for inventing sustainable futures.

Today, only a small number of people are truly educated. The common people, if they seek knowledge, merit and skill, it is only for job search, and when they reach their goal, they also stop learning. While learning is a lifelong process, the education system needs to evolve to meet the right to learn. Education must have a broad foundation, because knowledge changes rapidly. Therefore, the spread of knowledge is obligatory and no one should keep it with them.

Education is not cross-cutting, it is lifelong. It should be all spatial and permanent. It should not be limited to the four walls of the classroom and school. Wherever there is a human being, there must be education. The education system must be flexible. Developing countries, in particular, must acquire technological skills and apply them in a way that ensures universal literacy.

Technology and education

The twenty-first century warns us one step away. When this century comes, a storm of technology will arise that will change the face of the earth. We and our expectations of an intense life are affected by new technologies. The cashiers give their place to the "bar code" reader and the car engine troubleshooting is left to the computer. These and

thousands of other continuous changes that are evident in our technology community create new expectations for people.

If schools do not change their curriculum, future generations will not know much about many of the basics of lifestyle, the technology of their day.

E-learning technologies, which were clumsily introduced into American schools in the 1980s, are finding a place in the practical foundations of the new educational structure. After this false start, which was accompanied by false hopes, educators have learned two basic lessons about computers; What works for it and what does not work for it. It should be noted that the computer does not work miracles. Getting hardware into a classroom does not necessarily mean starting a learning movement. If the e-learning aids are well-equipped, they can teach the children individually, helping each student to progress without further assistance; It frees up the teacher's time and allows him to use his time and experience effectively. But the computer does not know the wonderful art of good speaking, which is the essence of teaching. Another is that although the computer can increase the teacher's attraction and multiply his impact on students, it cannot replace him.

Of course, the teacher has no choice but to use media and technology in the classroom because:

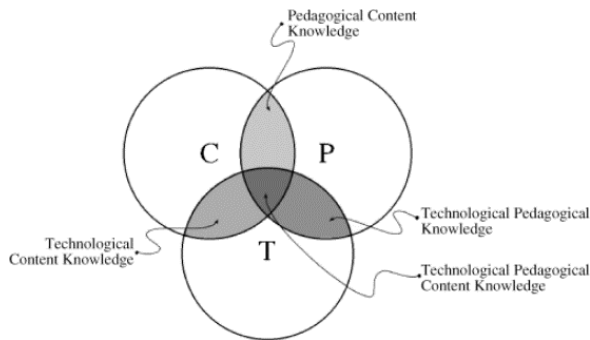
- Technology does not have a negative orientation towards various socio-economic issues and to some extent cultural issues, and with basic training in its application, it can educate all children in the same proportion. In other words, if we give students an introductory course in computer use, we can use the computer well and safely.
- Technology has made dreams come true.
- Technology has not only bridged the gaps, but has also led to the accumulation of science and rapid access to knowledge.
- Technology improves the quality of education. In the world of digital technology, if we still insist on the use of chalk and blackboard in education, our distance from the world of science will increase day by day.

Content knowledge, pedagogy, technology, framework for teacher knowledge (TPACK)

Research in educational technology has often been criticized for its lack of theoretical foundations. This paper proposes a conceptual framework for educational technology based on Schulman's formula of "pedagogical content knowledge" and extends it to teachers who integrate the phenomenon of technology into education. Efforts are being made to learn some of the essential features of the knowledge required by the teacher to incorporate teaching technology. In short, it is argued that applications of educational technology require the development of a complex and extensive form of knowledge, which we call content, pedagogical and technological knowledge (TPACK). In doing so, complex maps and the interaction between them assume three main components of learning environments: content, pedagogy, and technology.

The advent of digital technology has dramatically changed the way work and practical work are done in most areas of human work. Proponents of technology in education are seeing similar dramatic changes in the teaching and learning process.

It may be inappropriate to view technological knowledge separately from pedagogical and content knowledge. Contrary to this view, the framework emphasizes communication, interaction, content, pedagogical, and technological constraints. In this model, content knowledge, pedagogical knowledge, technology knowledge are good for teaching development. This model emphasizes the interaction of these three bodies of knowledge. A good teacher needs to understand how technology relates to pedagogical and content knowledge.



Content pedagogical knowledge of technology is an emerging form of knowledge that goes beyond all three parts (content, pedagogical and technological), is the basis of good education and requires understanding of concepts using technology.

The Tpack model demonstrates how content, pedagogy, and technology interact dynamically.

This framework can be used to design pedagogical strategies and an analytical lens to study changes in the teacher's knowledge of successful teaching with technology.

Fifty Golden Tips for Successful Teachers

Whenever people want to be considered as a professional in their work, they must have the conditions and requirements. Basically, becoming a professional in any job has its own rules. The teaching profession is no exception to this rule.

We often mistakenly think that experienced teachers with high level of knowledge and information are also professional teachers. Although the above is a prerequisite for any professional teacher, it is not enough. We may find teachers who have a long history in the field of teaching, but have not been able to act as a professional teacher, in other words, they have not been able to attract the attention of students, either in terms of teaching method or classroom management. We also encountered teachers who were in a good position in terms of teaching and management methods, but in no way were able to provide an attractive class for the learners.

Education is a very delicate, complex and sensitive technique that can be done only with efficiency, professionalism and accurate knowledge of the issues and factors of education and the teaching-learning process. Because this job requires special knowledge, awareness, expertise and skills, without which education can not be done. In order to maintain and increase his efficiency and effectiveness, the teacher must be constantly learning, always follow the changes and developments related to his profession, and according to the progress of science and technology in various fields, improve his knowledge, skills and information. Possessing and applying these skills helps the teacher in teaching and performing educational activities and provides the necessary interaction between him and the students. As a result, the teacher can provide context and conditions for students during teaching that make learning and teaching easy, enjoyable and exciting.

The 50 characteristics of a successful teacher are:

- ❖ Familiar with the characteristics of growth and the needs of learners in each course.
- ❖ Master the educational content and the subject matter of the course he / she wants to teach.
- ❖ Uses teaching methods that are tailored to the students' situation, needs, and experiences.

- ❖ Reveals students' educational process and academic achievement through continuous assessment.
- ❖ It uses tests to evaluate students who, while identifying students' academic weaknesses, do not compare them.
- ❖ Gives students accurate information about their performance, so that they are aware of the extent of their teaching and learning activities.
- ❖ Uses a variety of teaching methods and learns effective methods and new solutions.
- ❖ Ability to learn and apply knowledge,
- ❖ Has the skills, principles and results of psychological research in teaching.
- ❖ Before starting to teach, he / she learns about the physical and mental characteristics of the students and their readiness to learn.
- ❖ Recognizes students' suffering and strives to maintain their secrecy and gain their trust and confidence.
- ❖ Examines students' issues and problems.
- ❖ By creating a good atmosphere in the classroom and establishing proper communication in the classroom, it calms the students and increases their self-confidence.
- ❖ Uses a set of plans, strategies, and actions in the classroom to maximize his or her training.
- ❖ His subjects have a principled and logical structure when teaching.
- ❖ It does its best to keep students active.
- ❖ Uses the question and answer method to draw students' attention to the subject of the lesson and class discussions.
- ❖ The atmosphere of his class is such that it increases the empowerment, confidence, self-confidence and active presence of the students.
- ❖ In his class, students have the right to choose.
- ❖ His guidelines and strategies in the classroom are precise and clear.
- ❖ He is interested in matters related to planning decisions, especially the curriculum.
- ❖ Uses the conditions and issues related to the curriculum in the best way, in order to achieve the desired goals and results.
- ❖ Creates the necessary flexibility and change in the curriculum according to the needs of students and local and indigenous facilities.
- ❖ Reduces the complexity of the curriculum as much as possible and increases its adaptation to students' learning conditions and situations.
- ❖ It is creative and can solve the problems and difficulties of students' learning by inventing teaching methods and preparing educational materials.
- ❖ He can communicate with students very quickly and easily and keep the atmosphere of his classroom favorable and ready to learn.
- ❖ He is very sensitive in the classroom and acts decisively and seriously.
- ❖ Uses the reward and punishment process artistically and in appropriate situations.
- ❖ Arranges a variety of activities and skills in the classroom to prevent student indiscipline and misbehavior.

- ❖ He can easily master the situation of his class, recognize the shortcomings and problems of the students and offer appropriate solutions.
- ❖ By applying appropriate techniques and methods, it harmonizes the teaching-learning process with the experiences and needs of students.
- ❖ Her class is always a lively and refreshing class and the students have enough confidence, calm and self-confidence.
- ❖ His teaching method is in line with the principles and goals of education and the characteristics of students.
- ❖ In addition to mastering his field, he is interested in his work.
- ❖ He has motivation and confidence in his work.
- ❖ It is compassionate and friendly with students and increases their creativity.
- ❖ Pays close attention to the nuances of "training and learning" psychology.
- ❖ It does not compare students, but helps them to pay attention to individual differences.
- ❖ It does not force students to learn, but regulates learning situations so that they are willing to participate in learning.
- ❖ Motivates students to collaborate on a variety of issues.
- ❖ It already has the necessary program and preparation for class management and teaching.
- ❖ By providing appropriate information to students, it helps them overcome obstacles and problems.
- ❖ Uses punitive methods immediately after observing the wrongdoing in the classroom, so that the delinquent student can understand the connection between the wrongdoing and the outcome.
- ❖ Constantly uses innovative and thoughtful solutions in dealing with unexpected and sudden problems.
- ❖ Always uses the experiences and information of his colleagues.
- ❖ He never takes his worries and preoccupations to the classroom.
- ❖ It values creative thinking and creates a creative atmosphere in the classroom.
- ❖ It has an adventurous and curious spirit.
- ❖ Respects and encourages students' individuality and creative spirit.
- ❖ She tries to smile when she enters the classroom.
- ❖ He is patient in the face of students' problems and does not make hasty decisions (Pour-Ali Rezatokaleh, 2016).

Professional Qualifications of Teachers

Teacher competence refers to the teacher's ability to meet the professional needs and demands of teaching in a sufficient manner and by using an integrated set of knowledge, skills and attitudes so that this set is manifested in the teacher's performance and reflection (Raouf, 2021).

Teacher competence is a set of cognitions, tendencies and skills that a teacher can acquire to help learners physically, intellectually, emotionally, socially and spiritually during education. Teacher competencies can be classified into three areas: cognitive competencies, emotional competencies, and skill competencies. Cognitive competences

are a set of mental knowledge and skills that enable the teacher to recognize and analyze issues and topics related to education. Emotional competencies are a set of attitudes and interests of the teacher towards issues and topics related to education and skills competencies are related to the skills and scientific abilities of the teacher in the learning process from a set of three competencies The competence to influence the student is obtained (Hejazi et al., 2023).

According to (Delavar, 2000), progress in education generally depends on the qualifications and abilities of educational staff, especially on the human, educational and professional characteristics of individual teachers. According to Gage, there is no doubt that no one but the teacher can have a greater impact on what is going on in schools. It is the teacher who can make the process of education and training a process of pleasure and success or frustrating and fruitless. The executive guarantee of reforms in an educational system is to have good and efficient teachers. The success or failure of the best or weakest curricula depends on the teacher design and implementation.

METHODOLOGY

The present study is an applied research and the purpose of this research is the role of mental vitality in the mathematical performance of public and magnet school students based on the professional competencies of teachers and also their comparison.

In this study, for sampling from the statistical population, the available sampling method has been used. We selected 140 high school students in Golestan province in different grades and among girls and boys as a sample. In this research, the required information has been collected in two parts. The first part, which includes the theoretical foundations of the subject and the background of the research conducted.

The second part included the collection of statistics and information related to the studied variables in the statistical population of the study, which was done using the test score taken from students to assess their performance and a questionnaire. In this study, mental vitality refers to the score that subjects receive from the (Ryan & Frederick, 1997), Mental Vitality Scale. Validity or validity deals with the question of how much a measuring instrument measures what we think (Sarmad et al., 2011). In (Sadidi, 2013) research, to determine the content validity of the questionnaire, they were first provided to the supervisor, consultant, managers and experts, and the questionnaire was approved with modifications.

Reliability or reliability of a tool is its degree of stability in measuring everything that is measured, that is, to what extent the measuring tool gives the same results in the same conditions (Sarmad et al., 2011). In (Sadidi, 2013) research, in order to measure the reliability of this questionnaire, Cronbach's alpha method has been used, which according to the results of the questionnaire have acceptable reliability (Table 1).

Table 1 Cronbach's alpha is the main variable of the research

questionnaire	Number of questions	Cronbach's alpha coefficients
Mental vitality	7	85%

Also in the present study, in addition to the researcher, the study of knowledge and reality in the minds and actions of people, to obtain more complete information, the study of people's views and attitudes toward teaching, education and related issues, He also believes in using different approaches. In order to be aware of the cognitive competencies among the math teachers of public and magnet schools and to examine their attitudes, it was necessary to use a questionnaire to collect data. Therefore, teachers' data collection tool has also made a researcher-made questionnaire. There is almost no research done in this field. The questions of the mentioned questionnaire are extracted from these

meanings and it contains 39 items and has three subscales which are 14 items (respectively questions 1 to 14) Related to cognitive competence, 9 items (respectively questions 15 to 23) are related to attitudinal competence and 16 items (respectively questions 24 to 39) are related to managerial competence. This questionnaire is organized in a four-point Likert scale, the options of which are from low to very high and the scoring method is low or almost never (score 1), average or rarely (score), respectively. 2) is too much or too often (score 3) and too much or too much (score 4).

The opinions of professors and educational experts were used to examine its face and content validity. To evaluate the reliability of this questionnaire in a pilot study was performed on 32 people and Cronbach's alpha of cognitive competence was 0.91, behavioral attitude competence was 0.90 and managerial competence was 0.90 and the total reliability of the questionnaire was 0.96.

RESULTS AND ANALYSIS

Math teachers section of public and magnet schools in (Table 2):

Table 2 Scores of Mathematical Teachers of public and magnet Schools in Teachers' Professional Qualifications Test

Number of teachers	Scores of public school teachers	Number of teachers	Scores of magnet school teachers
1	118	1	128
2	129	2	137
3	132	3	141
4	122	4	131
5	128	5	140
6	124	6	134
7	136	7	147
8	129	8	140
9	129	9	140
10	132	10	142
11	132	11	140
12	121	12	131
13	110	13	125
14	120	14	136
15	119	15	129
16	133	16	142
17	116	17	127
18	120	18	133
19	113	19	124
20	129	20	137
21	117	21	127

22	119	22	127
23	123	23	133
24	116	24	126
25	120	25	129
26	112	26	124
27	104	27	115
28	111	28	126
29	114	29	128
30	117	30	133
31	121	31	137
32	109	32	122
33	111	33	129
34	112	34	126
35	110	35	125
36	116	36	130
37	117	37	127
38	110	38	125
39	109	39	123
40	127	40	138

Table 3 Results of dependent t test, grades of math teachers of public schools and magnet of professional qualifications questionnaire

		Mean	N	Std. Deviation	Std. Mean Error
Pair 1	public	119.6750	40	8.12526	1.28472
	magnet	131.3500	40	6.97450	1.10276

According to (Table 3), the average scores of math teachers in public schools and the magnet of questions in the Teacher Professional Qualifications Questionnaire are 119.6750 and 131.3500, respectively, which shows a significant difference. Gives. Also, the standard deviation is 8.12526 and 6.97450, respectively.

Table 4 Correlation rate, grades of math teachers of public schools and magnet of professional qualifications questionnaire

		N	Correlation	Sig.
Pair 1	public & magnet	40	0.949	0.000

Table 4 shows the correlation between the two variables. Sig sign. The desired confidence level indicates that its value is less than 0.05 and shows that the desired statistic and the correlation between the two variables are significant.

Table 5 Degree of freedom, grades of math teachers of public schools and magnet of professional qualifications questionnaire

		Paired Differences				t	df	Sig. (2-tailed)	
Pair	publi c magn et	Mea n	Std. Deviat ion	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
1		11.675	2.66398	0.42121	-12.52698	10.82302	-27.718	39	0.000

In (Table 5), as can be seen, the value of t is equal to -27.718 with a degree of freedom of 39 and the value of sig. It is less than 0.05, so with 95% confidence it can be concluded that the two samples are statistically significantly different from each other. Therefore, the professional qualifications of magnet school teachers are higher than the professional qualifications of public school teachers.

Student section

In this section, in order to analyze the data, two sections of descriptive and inferential statistics were used. In the descriptive statistics section, the mean, standard deviation, tables and in the inferential statistics section, statistical hypothesis tests, community t-test and coefficient test Correlation was used.

Descriptive statistics of research variables for the group of students are presented in the following (Table 6):

Table 6 Descriptive statistics of the studied variables

Gender	Class 10	Class 11	Class 12	Total
Boy	10	25	35	70
Girl	10	25	35	70

According to the (Table 7) the male and female students are selected equally. Also, approximately 7% of the tenth grade, 36% of the eleventh grade and the rest of the twelfth grade have been selected because the twelfth grade is of particular importance. Attempts have also been made to select students from both public and magnet schools equally.

Table 7 Mean index and standard deviation by gender

Row	Gender	Mental vitality	Function
Average	Boy	25.42	13.10
	Girl	27.98	14.13
Standard deviation	Boy	6.89	3.93
	Girl	7.64	3.58

According to the (Table 8), the anxiety between the two groups of boys and girls is almost the same, but the girls performed relatively better on the math test.

Table 8 Mean and standard deviation index of public and magnet students

Row	school	Mental vitality	Function
Average	public	25.42	13.10
	magnet	27.98	14.13
Standard deviation	public	6.89	3.93
	magnet	7.64	3.58

First, the question is answered whether there is a significant relationship between students' mental vitality and their performance based on the professional competencies of public and magnet teachers?

Pearson linear correlation coefficient has been used to investigate this question (Table 9).

Table 9 Correlation coefficient of variables

	Mathematical performance	
	The correlation coefficient	= sig Confidence level
Mental vitality	0.704	0.000

The value of correlation coefficient between the variables of students' mental vitality and their performance at a significant level of 0.01 in the (Table 9) was calculated using SPSS software. Due to the fact that the level of significance of the test is less than 0.01 (Sig=0), it can be said with 99% confidence that there is a significant relationship between students' mental vitality and their performance. This relationship is a direct one, that is, with the increase of students' mental vitality, then their performance will be more and better.

Now in this section, it is examined that there is a significant difference between the mental vitality of male and female students. To test this, t-test of two independent groups is used (Table 10).

Table 10 t-test independent

Levine test		T test for equality of means	
Statistics F	Significance level	Statistics t	Significance level
2.691	0.102	0.794	0.228
		0.803	0.234

According to Levin test, since the F statistic is equal to 2.691 with a significance level of 0.102, ie more than 0.05, the equality of variances is established, so we use the first line for analysis.

Now, using independent t - test, the statistical value of this test has been calculated at a significant level of 0.05 equal to 0.794 using SPSS software. Due to the fact that the significance level of the test is more than 0.05 (Sig.=0.288), it can be said that the mental vitality of male and female students is not different.

Now, considering the difference between the professional qualifications of math teachers in public and magnet schools, the question is answered whether there is a significant difference between the mental vitality of public and magnet school students. To test this, t-test of two independent groups is used (Table 11).

Table 11 t - independent test

Levine test		T test for equality of means	
Statistics F	Significance level	Statistics t	Significance level
0.089	0.776	2.692-	0.036
		2.692-	0.036

According to Levin test, because the F-statistic is equal to 0.089 with a significance level of 0.776, ie more than 0.05, then the equality of variances is established, so we use the first line for analysis.

Now, using independent t - test, the statistical value of this test has been calculated at a significant level of 0.05 equal to -2.692 using SPSS software. Due to the fact that the level of significance of the test is less than 0.05, it can be said that there is a significant difference between the mental vitality of students in public and magnet schools and this variable is more in sample schools. There is more mental vitality among schoolchildren, so there is enough energy to do the activities and the homework is going well.

CONCLUSION

Various factors play a role in mathematical weakness and performance that have been studied by researchers throughout history. This study investigated the effect of mental vitality on the mathematical performance of male and female students in public and magnet schools based on the competencies of school math teachers. The results showed that gender has no significant effect on students' mental vitality. It is different in public and magnet schools.

Mental vitality helps students to be more successful in solving problems and performing in the face of problems.

References

- Arabzadeh, M. (2017). Relationship Between Basic Psychological Needs and Mental Vitality in the Elderly. *Salmand: Iranian Journal of Ageing*, 12(2),170-179. <http://salmandj.uswr.ac.ir/article-1-1149-en.html>
- Aghazadeh, M. (2007). *Handbook of New Teaching Methods*, Ayesh Publishing, Tehran: Third Edition.
- Bessant, K. C. (1995). Factors associated with types of mathematics anxiety in college students. *Journal for Research in Mathematics Education*, 26(4), 327-345. <https://doi.org/10.2307/749478>
- Deci, E. L. & Ryan, R. M. (2000). The “What” and “Why” of Goal Pursuits: Human Needs and the Self-Determination of Behaviour. *Psychological Inquiry*, 11(4), 227-268. https://doi.org/10.1207/S15327965PLI1104_01
- Delavar, A. (2000). *Research Method in Psychology and Educational Sciences*, Tehran: Eighth Edition.
- Goya, Z. (2021). Professional development of math teachers: a necessity. Kermanshah: Abstract of the articles of the second conference on mathematics education.
- Hejazi, Y. & Pardakhtchi, M. H. & Shah Pasand, M. R. (2023). Teacher professional development approaches. Tehran: Tehran University Publishing Institute.
- Javanmardi, M. (2021). Sharp and small skills of a teacher. Sanandaj: Minerals.

- Karimi, F. (2022). Professional competencies of teachers. Isfahan: Islamic Azad University, Khorasan Branch.
- Mousavi, F. & Pakzad, Z. & Safdari, M. (2017). The Role of Electronic Testing on Reducing Students' Test Anxiety. *Journal of Instruction and Evaluation*, 10(39), 135-149. https://jinev.tabriz.iau.ir/article_533389.html?lang=en
- Pachana, N. & Laidlaw, K. (2014). *The Oxford handbook of clinical geropsychology* Oxford: Oxford University Press.
- Raouf, A. (2021). *A Study of the Global Movement for Improving Teacher Education*. Tehran: Publications of the Research Institute of Education.
- Raouf, A. (2020). *Teacher Training and Internship*, Ravan Publishing, Tehran: First Edition.
- Raufi, M. H. (2022). *Classroom Management, Fourth Edition*, Tehran: Astan Quds Razavi Publications.
- Ryan, R. M. & Frederick, C. (1997). On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being. *Journal of Personality*, 65(1), 529-565. <http://dx.doi.org/10.1111/j.1467-6494.1997.tb00326.x>
- Sadidi, M. (2013). Investigating the Role of Predictors of Parents' Independent Support in Basic Needs and Welfare Indicators in Hormozgan University Students (2012-2013) Academic Year. Hormozgan University. Qeshm University Campus.
- Sarmad, Z. & Hejazi, E. & Bazargan A. (2011). *Research Methods in Behavioral Sciences*, Tehran: Agha Publications.
- Taheri, Morteza, Mahboubeh Arefi, Mohammad Hassan Pardakhtchi, Mohammad Ghahremani (2013). exploring the process of professional development of teachers in teacher training centers: data theory of the foundation. *Quarterly Journal of Educational Innovations*, No. 45, Year 12, Spring 2013.
- Zandi, Ahmad. (2003). Teacher and student: Intimate relationship between teacher and student. *Monthly teacher development*, 178, 34-33.
- Zarei Zavaraki, Ismail, Roshan Ahmadi, Dariush Norouzi, Ali Delavar, Fariborz Dartaj (1396). Codification and validation of the educational design model of professional competencies of student-teachers based on national and international upstream documents. *Curriculum Technology*, Second Year, No. 3, Spring and summer 2017.