

**Study the effect of Ucmas mental health system design as the most effective learning experience in math**Seyed Ahmad Hashemi<sup>1</sup>, Masoomeh Ahmadi Pour<sup>2\*</sup><sup>1</sup>Associate Professor of Educational Sciences, Lamerd unit, Islamic Azad University. Lamerd. Iran<sup>2</sup>Ph.D. student of curriculum planning, Lecturer and employee of the University of Cultural Sciences in Bushehr Province. Iran**ARTICLE INFO***Article history:*

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Email: [mahmadipour0421@gmail.com](mailto:mahmadipour0421@gmail.com)**ABSTRACT**

Mathematical education, as one of the most important basic courses, is of great importance in any educational system in the world. The invention of modern mathematical methods, such as the Ucmas method, is an activity that researchers around the world are focusing on. Since 1993, when the system was introduced in Malaysia, more than 60 countries have become members of the Ucmas organization and millions of children and teenagers around the world have benefited from the training program. The present paper aims to examine the effect of using this design in the mathematical classroom with the aim of learning a quick and accurate mental calculation that results in concentration and ability to solve the problem. By creating an infrastructure framework, this project will develop the skills needed to learn in school and the everyday life of the individual. Findings show that people who use this technique in their mental calculations will have a very high coordination between the two hemispheres and will unconsciously use all levels of their brain. So, let's look at the features of this design that distinguishes it from other math education projects. The features of this plan include strengthening the power of concentration, increasing creativity and speeding up students' accuracy, which will be discussed in this article.

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**1. Introduction**

From the late nineteenth century, the answer to teaching and learning issues in non-mathematical fields has been sought. Combining the competencies of various educational sciences and other academic fields such as pedagogy, psychology, philosophy and medicine has contributed greatly to this. Initial work in this area concerned students with special needs, but it soon became evident that the methods used in these cases were also appropriate for dealing with the problems of teaching and learning common children in schools. The mathematical content studied was mainly related to the account, but the use of tangible materials on the teaching of geometry was also influential. Teachers were practicing the teaching and learning of teacher-students at schools. Schools were established and operated with the aim of testing new teaching methods. In these schools, practical work has been intensely integrated with research, thus the two different research trends were produced. One had a research concern about teaching methods, and the other was interested in observing student behavior during learning. Both trends they were rooted in learning theories that they wanted to know what was going on in the mind or brain of the learner (for example, the Piaget theory), and they rooted in the teaching theories that discussed the child's behaviors during the learning process (like Bruner's theory).

In this regard, learning can be considered the most fundamental process that thereby a disable and helpless creature over a period of time and physical interaction and development becomes an

evolved person whose cognitive abilities and the power of his thinking do not know the boundaries. Extensive variation and the extension of the time of human learning that extends over his longevity causes that in spite of the many differences in learning that they have some have trouble in the normal process of learning and teaching, especially in mathematical education commonalities in them, such as turbulence in spatial relationships, the problem of perceptual-vision capability and motion-vision, weakness in concepts such as language and orientation, memory problems, and math anxiety. Therefore, since math problems for children, family and society can be considered a major problem. Therefore, it is important to have solutions to deal with this problem. In order to intervene and treat mathematical learning disabilities, various psychological and educational approaches have always been presented. Meanwhile, one of the training that can play an important role in mathematics is through mental calculation or Ucmas. Ucmas is a tool used to calculate the four main actions (addition, subtraction, multiplication, and division) in mathematics and in more advanced mode to calculate the fraction and the square root of numbers is also used. Ucmas plays an important role in reducing the math problems of children, so that the sides of the brain develop in an integrated way. When children move abacus with the hand, the relationship between the hand and brain stimulates the right and left hemispheres of the brain. The Ucmas program is a unique child development program developed by Dino Wang in Malaysia in 1993. Using an innovative computational system, this

program with the use of the abacus, causes the brain to move (the left hemisphere and the right hemisphere) simultaneously. In fact, students aged between 5 and 13 years develop their mental capacity by learning mental calculation quickly and accurately, which improves skills such as attention and concentration.

The Ucmas program not only leads to self-confidence and mastery in computing, but also provides a framework for the development of the skills needed to learn in school and the everyday life of children. Also, this method creates a very high cognitive ability in students that will be able to apply it in all areas of life. Better focus, educated creativity, and strong memory helps students to provide a managerial solution in dealing with issues.

Therefore, the present article while explaining the features of the Ucmas mental arithmetic system, emphasizes the necessity and importance of using this design as the most effective learning experience in mathematics.

### Research method

The research method in this study was librarian and was performed through reviewing research articles and an overview of foreign and domestic journals and magazines in different databases based on selection criteria. First, using the key words (Ucmas mental system design, the most effective experience, learns math lessons) articles extracted from the above databases. Then, by reviewing the abstracts of articles, each article that had selection criteria, selected for review and the study was done on it.

### Research findings

**First question:** How does the design of the Ucmas mental arithmetic system strengthen the power of concentration in students?

Memory is a kind of mental function that allows us to preserve the states of consciousness such as pleasures, pains, desires, demands, information and judgments, and retrieve them again in our minds. Each person's memory varies from one another, but people can work on their memory and improve the power of reminding and processing information. Memory allows you to remember and retrieve information or recognize previous encounters with success and present information, which is the basis for learning memory.

William James (1901) divided memory into two primary memory and secondary memory, which cognitive psychologists called them short-term and long-term memory after 70 years. Primary memory is related to the physical state of memory, and it is considered to be a connotation. According to him, the more information has communicated with each other, and the more speeds given to the individual, the more information will be remembered. Therefore, he suggests three ways to learn:

1. *Mechanical method:* Learn from the four channels of the eyes, ears, sounds and hands. In this method, repetition and practice is very important.

2. *Rational Method:* In this method, rational methods and reasoning are very important.

3. *Innovative method:* From which it refers to technical memory and it considers the science of the invention as the method of the invention.

The Ucmas system has 10 main levels and 2 preschool levels, and each level lasts three and a half months and will be implemented for students aged between 5 and 8 and 8 to 13, who have the ability to read, write, and be able to perform addition and subtraction functions of 1 to 9. This educational system has the unique tools and

means by which the educational process is carried out precisely. Among the Ucmas educational tools that include the following are:

1. *Abacus:* A tool used to calculate the four main actions (addition, subtraction, multiplication, division) in mathematics.

2. *Book:* Each level has 2 full-color books. Also, a volume of practice books is added from level two to the next to the educational system.

3. *Practice Notebook:* Each level has two notebooks, one for audio technique and one for the technique of writing fast. In audio techniques, students perform the required math operation through their auditory system. In the technique of writing fast, numbers are trained based on formulas that result in accuracy and speed in computation.

Therefore, the Ucmas system increases the level of focus on an issue, so that it minimizes distraction and secures the person from getting out of the study process or workflow and drowning in thoughts and imaginations and ensures learning and doing the right things and getting rid of the possible risks of problem solving. This method, better than any other method, helps the memory to be deeper and more meaningful in detail, by organizing the subject, it is easy to learn, preserve, and then remember the mathematical problems and placed them in a logical hierarchy and divided into a subcategory of the whole, partly and from top to bottom, and remembered. In the classroom, this method provides a set of conditions governing the learning environment so that the student can easily retrieve the contents.

**Second question:** How does the design of the Ucmas mental arithmetic system increase the creativity of students?

Creativity is one of the key capabilities of accessing economic resources and understanding the complexity of individual and social developments (Blaker, Beetow & Dove 2004 and Ranco, 2004). Today, human societies increasingly feel the need for creativity through natural resources analysis, interdependence between countries, and the ever-increasing pace of change (Sternberg and Grigorinko 2004). Studies show that many aspects and facets of math creativity in educational environments are still unknown to scholars. Some mathematicians consider creativity in mathematics to be a combination of ideas and consider combining well-known ideas into new ways of an innovative work. Ornick states that the driving force behind math creativity is composed of the interaction of various elements such as perception, intuition, insight and ability to generalize. Therefore, creativity is an important objective of the Ucmas method, which familiarize students with a more accurate explanation of the learning process and provides many opportunities in the math classroom for individuals, so that encounter with solving challenging math problems and assignments that make them experience math creativity. Therefore, teaching Ucmas mental development training not only does not contradict the system of mathematical education in schools, but teaches students with concepts and mental imagery as supplementary training using these techniques.

**Third question:** How does the designing of the Ucmas mental arithmetic system increase the confidence of students?

Every person has a mental image of his own personality, view, and strengths and weaknesses that develops from childhood. This image is called "self-image", that is the notion that a person has of his own mind. The person's self-image plays a very important role in shaping his self-confidence. Many of these imaginations we have are based on our interaction with others and the experiences of our

own lives. Confidence depends on how much one feels that is acceptable to others and how valuable it is to itself.

Ucmas in learn problem-solving skill helps students to strengthen their self-esteem in doing things they have not done so far and find answers to puzzles, questions, and issues they face in their day-to-day lives. . This learning is realized both in individual exercises and in group exercises. Also, this method in problem-solving training, which is a logical process, helps the student to recognize the problem, find various options, test options, and evaluate what is happening Which will result in a sense of distinguishing him among a group of students along with a golden confidence. When the student is capable of solving problems that others cannot solve, surprises others and gives him confidence; and this self-confidence will undoubtedly be the key to success in all phases of his life in order to be able to solve math problems with confidence, and with more speed and accuracy, because low self-confidence reduces person's speed and accuracy in solving math problems and since calculating a mathematical problem requires a very high accuracy, the smallest mistake in calculations brings him away from the answer. So, when a mental calculation is done correctly, while is fast enough also has a high degree of accuracy. That calculation leads to the correct answer and the process of mental calculation increases the accuracy and speed at the same time in their graduates.

### Conclusion

The purpose of the present study was to investigate the effect of mathematical education in Ucmas method on students' ability development. One of the reasons to explain this finding is that solving mathematical problems is a complex intellectual activity. If this complex activity can be trained in a space combined with reasoning, analysis, planning, monitoring, and evaluation, it is to be hopeful that, learners will understand mathematics rather than memorizing formulas and learn how to learn and how to use that skill in real situations.

To achieve this goal, teacher education system in the field of mathematics education must be transformed. Therefore, it is suggested that the policies of human resource education in the Ministry of Education are defined in such a way that teachers of various fields, such as mathematics, are first aware of the use of Ucmas in mathematics, and understand the value and importance of mathematical education in the way of working with numbers (Scass, Trawor and Western, 2001 quoted by Motamedi, Barqi Irani and Karimi 1391).

In teaching in Usmas method each student learns summation and subtraction quickly and has the opportunity to think about the content. Student gradually realizes the concepts through problem solving during a process and instead of seeing the teacher walk, practicing and learning step by step and by finding out his abilities sense of self-confidence is strengthened in him. Therefore, considering the effect of the Ucmas mental calculation on increasing the students' performance in solving the math problem, it is suggested that, like Ucmas, other active methods and student learning tools be used

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