



# The Necessity of Math Education in Primary School

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**Abstract:** *Modern mathematics plays a vital role in science, commerce and industry, because it is firstly considered a powerful, authentic and inspirational communication device and secondly, it is a tool for measurement and prediction. The power of mathematics lies in its signs (symbols) that include grammar and analysis, as well as its particular combinations. Mathematics can develop rational thinking and also enjoy an aesthetical attraction. Perhaps many people, and even teachers suppose that mathematics has been defined as the state of the art in computing and the responsibility of mathematicians is to spend their entire lifetime for making complex mathematical calculations. In this sense, such a belief is not sufficiently close to the truth. The core function of mathematicians is reasoning not calculation. In fact, the goal of teaching mathematical concepts is not to calculate; rather it is to develop the rational thinking of learners which is considered very important. The main purpose of this paper is to expand and develop an interest in mathematics as well as to strengthen motivation. In addition to mentioning the importance and necessity of learning math lessons in the elementary course, this paper seeks to present the principles of teaching mathematics in order to improve its teaching in this course.*

**Keywords:** *Math Education, Primary School, Teaching, Mathematic*

## INTRODUCTION

Methods and techniques of math have penetrated into every corner of our life. Modern mathematics is not the only basis for calculation. Rather it is supposed as a strong weapon for research purposes and surpasses the experience over and over again. Yet today's young seekers are confronted with such a level of progress dating back to around 100 years ago and they must possess abilities and powers for the development of natural sciences, industry and economics. They should open up their secret thoughts and explore the biggest cosmic mysteries, keep up with industrial processes and find effective ways to diagnose diseases (Kiyamanesh, A., 1997). Nowadays, the aim of teaching mathematics, which should be began from pre-primary ages, is to gain social and psychological value in addition to intellectual development. The main goal of mathematics is to reinforce the child's mind, in the sense that the sooner his mind and thought is enhanced; the more likely he is to be successful in their future life. Parents are always concerned about teaching math to their children and a group of schools and teachers in elementary school attach more importance and value for mathematical lesson. But what exactly is the purpose of elementary mathematical education? Awareness of these goals helps parents and teachers to choose the appropriate methods and activities. In the early twentieth century, John Dewey argued that learning occurs through practice. Although mathematical learning in children has been discovered before, the importance of practice has not received much attention yet. This proficiency can be attained in many ways, and the continuous presence in the real world business provides such opportunities. It seems that the quote themed on mathematics is built by some definitions is somewhat ironic. Definitions are extremely important in mathematics, but it should be noted that establishment of communication with them depends on

his previous childhood discoveries. Otherwise, all information in the mind of the child will be processed in a messy and unrelated manner. In the classroom, learning should take place by a step-by-step approach and from specific states to a topic generalization (Kiel Patrick, Jeremy, Sue Ford & Jane, 2008). For example, the simplest way to find its circumference concept is through direct definition. There is a better way to do this which involves the use of models demonstrating the circumference concept such as glass marbles, balls, balloons.... In this way, the circumference concept develops gradually. Of course, math can be learned through non-consecutive exercises. In addition, children are able to learn through sight, listening, reading, following up, guidelines, imitation and testing. These actions assist children to learn better. Furthermore, each of these actions can be taken by the learner appropriately by using the teacher's model and directions, and assures meaningful learning in children. Learning also depends on the learner's personal characteristics, such as previous experiences, puberty and motivation. In general, there is no comprehensive, unambiguous and direct learning theory for each student at any level that can be used in a satisfactory manner. Building bridge for learning is one way of learning mathematics. By providing a concept-based infrastructure, real world experiences will enhance the ever-increasing amount of mathematical learning in a person. Teachers should help to establish a relationship between real experiences and mathematical concepts in students. In turn, these relationships lead to the creation of the necessary bridges to learning. The connection of the real materials with the symbols is obtained through their illustration and description. In other words, learning mathematics can be accomplished through the visualization methods, then semi-visualization, and eventually single and symbolic techniques (Mobashsher, M., 1999).

### **Objectives and necessity of mathematical education**

A lifelong learner is characterized by three features:

1. The desire to learn;
2. Identifying a learning tool, namely, knowing how to learn
3. Learning basic knowledge.

According to the above characteristics, the general objectives of mathematical education in the elementary course can be summarized in three areas:

1. Knowledge Objectives: Acquisition of essential and basic knowledge of mathematics
2. Objectives of skill: acquisition of essential skills or learning methods
3. Attitudinal Objectives: The desire to learn to achieve a better life

Which one of these goals should be focused on in classrooms?

Mathematical learning skills in fact provide tools and learning methods skills refer to a set of student's abilities that their cultivation involves learning how to learn. Today's educational system focuses on learning skills, because materials are forgotten or become unavailable over a period of time and they are unable to solve a problem and to acquire new knowledge when they are faced with a new situation. Progress in acquiring these skills by the student also increases their desire for more knowledge and the special value of skill goals to create interest, curiosity and thinking as well as the desire to know (Vandewelle, J. A., 2001).

There are some special skills in math education that are being emphasized:

- 1. Estimation or numerical approximation**

These skills are widely used in most mathematical concepts. In general, they can be used in the majority of the computational and operational topics as well as relevant measurement issues. The application of approximation in problem solving is one of the most important applications of this skill. Among the many problems, approximate numbers reveal the solution to the problem, and in some cases it is estimated to lead to complete solution.

## **2: Measurement:**

Measurement instruction encompasses components such as length, volume, time, mass, angle and temperature. This skill can be used to apply to your everyday life. The student should be able to identify and select the appropriate instrument for measurement. Another section related to this skill is the use of appropriate units in measurements.

## **3. Tools & Technology:**

The use of tools refers to the proper application of the special tools and instruments used to measure including scale, ruler, protractor, set-square and meter....

These measurement instruments are used in various quantities and the application of technology is viewed as the correct and timely use of the calculus and computer in learning mathematics. In these cases, it is necessary to teach students how to correctly use that tool.

## **4. Patterning, forecasting and modeling:**

One of the drawbacks of the Iranian students participating in the study was the lack of recognition and their ability to answer the questions used in the patterning. Students were unable to discover the relationship between numbers and shapes. Patterns of skills are divided into two categories:

1 Numerical pattern 2. Geometric pattern

To develop this skill, students can model using their Kuestner cubes and other student can predict its pattern; this kind of activity has a significant contribution to enhancement of student's creativity.

## **5. Geometric diagrams and intuition**

The ability to analyze and interpret graphs as well as draw charts is among the skills required in this course. The first step in implementing this mode is to classify geometric shapes and combine them to create new geometric shapes (geometric intuition). This skill has been frequently used in the fourth grade. This activity can enable students to build shapes in a better way as well as make new shape by putting them together.

## **6. Discovery and reasoning**

Mathematical reasoning is one of the most important parts of mathematical thinking. Mental thinking involves employing math skills to form ideas, discover relationships between them, and obtain results and solve problems that deal with math. Simply put, the reasoning skill is the ability to justify correctness or falsehood for propositional results.

## **7. Making a hypothesis:**

Hypothesis is considered to be a very important skill requiring training. So the first part of this training skill is to give an explanation of the hypotheses...

In the second step, the student must learn to test his hypothesis and to check their accuracy and incorrectness; thus computational methods are assumed assumptions made by the student. This skill is widely used in geometry and the relationships between sides - angles and other components of geometric shapes like triangles - quadrangles, and so on.

## **8. Counting**

This skill will basically be used in the pre-primary and primary years, but they can be taught for the years to come. The goal of this skill is the ability to count everything by students using a variety of different strategies and methods.

## **9. Numerical Calculations and Mental Operations:**

Most of the mathematical content in the elementary course is related to the teaching of concepts and computational methods (four main actions) on the set of arithmetic -fractions and decimal numbers. To train this skill, the concept must be given first. Learning and techniques can be obtained by relying on concepts.

#### **10. Problem solving**

Problem solving is a kind of sophisticated learning. To solve a problem is a part of every person's life. Education should prepare students to manage their future life. The problem solving is the process of coping with everyday living conditions. Problem-solving skill is the focus in mathematical education and it is emphasized more than other skills and goes beyond all skills.

In general, the general necessity of mathematical education in the elementary course can be demonstrated as follows:

Development of logical thinking

To develop math concepts

To develop the ability to understand math

To develop problem-solving ability

Acknowledgement development and favorable attitude toward mathematics

Understanding the dynamic role of mathematics in the society and the advancement of other sciences and technological changes

To develop the skills of applying mathematics to daily life and continuing education

Therefore, the purpose of this course is not complete teaching of all mathematical concepts. The mathematics concepts arise from the child's minds during the pre-primary or pre-school period. The goal of this course (elementary) is to develop a higher grade. In this course, students have to deal with goals and necessities such as concepts, logical thinking, understanding, valuation, desirable attitude so that they can come out math giant from their minds.

#### **The importance and necessity of mathematical education in the elementary course**

The purpose of social and psychological value acquisition, its focus, as well as the development of scientific subjects and its methods and experiences is to use it in other modern sciences and technologies [2]. Therefore, it is necessary for the teacher to pay attention to the physical, psychological and scientific aspects of the students while teaching. The major goal of mathematics is to strengthen the child's mind and the sooner it happens, the more likely he gains more success in his education. The child is able to gain an understanding of mathematics through the experience of his surroundings, because all things around the child are somehow related to mathematics. He also has the ability to learn mathematical relationships and their scientific uses without any knowledge of mathematics and its general concept. The child's questions about objects around him are associated with the mathematical relationships among objects. Children seem to have the capabilities and readiness to learn the attitudes, prejudices and ethical values of their parents and teachers. Although, we do not have through knowledge and information about how much parents' attitudes toward math affect their children, many students think find it difficult to learn the mathematics. Math concepts and skills have close interconnected to each other. Therefore, planning and education for teaching math should be established in such a way that students understand these relationships and learn mathematics in an integrated manner. Furthermore, mathematics encompasses all its relationships with everyday life, other sciences and its applications in the future student's academic life (Clements, D. H.; Sarama, J., 2009). As a result, the establishment of this mathematical link with its applications in everyday life and other sciences such as art and natural sciences should be taken into consideration in the mathematics curriculum, because as far as we know one of the goals of general education in elementary schools is to educate and prepare students for future life so that they can be active and independent in their personal life and be able to be a helpful and determined individual in their work and life as well as for in the society they live in. To achieve this, schools need to provide the necessary opportunities for analyzing information, making decision, and acquiring skills in utilizing smart tools to solve problems in their students and help them to understand and apply the beautiful and logical

relationships contained in the mathematical formulas. Perhaps a group would like to increase and enhance math learning by increasing the amount of math hours and decreasing the amount of learning hours in other lessons. However, according to experience, the amount of math hours is not alone sufficient to increase the level of student's information and knowledge, and therefore it seems that reducing the number of hours of other lessons, including sports and craftsmanship, etc., to compensate for the withdrawal and incomplete development of children in the math is a blunder. The rational and practical solution of this problem is to pay attention to the quality rather than the quantity of mathematical teaching implying that each of these special stages of presentation of the mathematical material should be taken into consideration in the stages of mental development of a child and his learning abilities should also be taken account (Davis, S. B., 1984).

#### **Overall importance of mathematical teaching in the elementary school:**

As we know, the overall goal of teaching in this course is to prepare students for lifelong learning and the ability to acquire technological science literacy for students in their future society.

Therefore, the importance of math education can be described in three main areas as follows:

##### **1. Acquisition of essential knowledge**

Essential knowledge in mathematical science is the basic concepts we possess and is not subject to time changes despite of the spread of science and is a perpetual need in this world also.

##### **2. Acquisition of the necessary skills**

In math teaching, skills in fact refer to a broad set of learning methods and approaches. It is defined as a set of abilities that their reinforcement lead to development and enhancement of student's learning.

##### **2.Acquisition of essential attitudes**

Attitude is defined as a set of knowledge and skills necessary for students who have acquired from a given activity. The main purpose of all educations, including the acquisition of knowledge and the development of skills, is to achieve these values. In other words, mathematical knowledge and skills are roughly shared, but there are differences in attitudes toward mathematical education with respect to the values of society.

#### **Principles of math teaching in the classroom:**

Primary teachers can use a variety of ways to prevent a state of despair in teaching and learning math among the students. Therefore, prior to planning and preparation of math curriculum, teachers should take care to carefully consider the following points:

1. Providing a good learning environment
2. The need to emphasize all academic content
3. Involvement of students in solving daily problems
4. Use of math formulas can provide a suitable and sufficient opportunity for students so that they are enable to succeed in math in accordance with their ability to understand its rules.
5. Prior to teaching, they can contemplate a bit about their points of view, attitudes toward mathematics.
6. All students must be given equal consideration regardless of their gender or cultural background. There should also be enough opportunity to answer each person's questions.
7. In order to teach mathematical concepts and problem solving, students are divided into small groups of work and activity.

#### **How to teach math**

Successful teaching of math in elementary schools depends on the effective and appropriate use of the following factors in teaching:

1. Defining mathematical concepts for teaching
2. Identifying previous students' knowledge of mathematics in elementary school.
3. Parents' collaboration and involvement in math teaching
4. Precise planning for math teaching
5. Applying efficient management in the math class

### **Conclusion:**

Principles and suggestions for teaching in mathematics:

1. Problem solving is regarded as one of the methods of teaching mathematics.
2. In the teaching process, the factors underpinning the interest of children in the classroom should be identified.
3. All training should be based on the testing. In particular, the children should be tested with the help of their own man-made materials.
4. The conversation about mathematics should be one of the goals of teaching
5. The concept of the existence of the relationship between many mathematical ideas must be expanded.
6. Seeking- meaning of mathematics should be considered as a subject in teaching.
7. Group work in mathematics should be transformed into a conventional method.
8. Different needs of children should be taken into consideration.
9. Equal opportunities should be provided for children in learning mathematics.
10. Children's advancement in mathematics must be recognized through written tests.

Evidence shows that most schools use only a reference text for all students rather than referring to multiple books, or even changing them to suit group or individual needs. Textbooks provide a solid curriculum framework for students. Application of experiments, classroom activities and handmade learning materials can be useful and productive in mathematics teaching.

### **Verification of technology impact in schools**

1. Today, every reference textbook regarding introductory mathematics includes activities with a calculator and a computer for student use.
2. The fourth national mathematical assessment shows that 80% or 90% of fifth grade students use a calculator or have access to it.

### **REFERENCES**

1. Kiyamanesh, Alireza (1997). Intended program for elementary mathematics course in Iran and several countries. *Research in education*. No. 7 & 8. pp. 42-62
2. Kiel Patrick, Jeremy, Sue Ford, Jane (2008). *Help children to learn mathematics*. Translated by Mehdi Behzad. Zahra Guya, Tehran, Fatemi Publishment.
3. Mobashsher, Manouchehr (1999). *Theoretical and practical knowledge of mathematical sciences in the 4th and 5th grades of junior high school*. Detailed report of the research project. Education Institute.
4. Vandewelle, J. A. (2001). *Elementary and Middle School Mathematics Teaching Developmentally*. New York: Addison Wesley Longman Inc. Press.
5. Clements, D. H., Sarama, J. (2009). *Learning and Teaching Early Math: The Learning Trajectories Approach*. New York, Routledge.
6. Davis, S. B. (1984). *Learning mathematics: The cognitive science approach to mathematics education*. Norwood, NJ: Ablex.

