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Research Article

BARRIERS FOR STUDENTS IN LEARNING OF MATHEMATICS

***Sharma Ankita and Verma Richa**

Department of Home Science, Dayalbagh Educational Institute (Deemed University),
Dayalbagh, Agra, Uttar Pradesh, India – 282005

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ABSTRACT

Mathematics is a subject with its own dignity and pride. Mathematics has a strong position in field of science and technology as well as it is the significant subject in human life. With its greater importance, students are required to learn mathematics from their childhood. Lack of mathematical knowledge could not make a student to progress in life, since it is required in everyday life. Although every student does not perform equally well in mathematics, because of its conceptualization. Students face various types of problems while learning mathematics. The present paper focuses on the various types of problems faced by students. These problems are broadly classified in student related; school related and family related factors. These problems became barriers in learning of mathematics. Therefore, these barriers should be reduced so that roots of teaching and learning of mathematics should be firmly kept since lower age.

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INTRODUCTION

Mathematics is the one of the most important subjects in daily life and most human activities are linked to knowledge of mathematics. In the rapidly changing world and in the era of technology, mathematics plays an essential role. To understand the mechanized world and match with the newly developing information technology knowledge in mathematics is vital. Mathematics is the mother of all sciences. Without the knowledge of mathematics, nothing is possible in the world. The world cannot progress without mathematics. Mathematics fulfills most of the human needs related to diverse aspects of everyday life. Mathematics has been accepted as significant element of formal education from ancient period to the present day. Mathematics has a very important role in the classroom not only because of the relevance of the syllabus material, but because of the reasoning processes the student can develop. The quality of teaching and learning in mathematics is a key challenge for teachers. It is important for teachers to adopt instructional design techniques to achieve higher accomplishment in mathematics (Rasmussen & Marrongelle, 2006). Instructional design alone cannot produce better learning and achievement. The instructional designer must know critical factors that influence student learning and build a bridge between goals and student performance. Identifying these factors will help to utilize limited resources including

financial resources and time more effectively (Libiensi & Gutierrez, 2008).

Significance of Learning Mathematics

Everyone needs an understanding of mathematics in everyday life for a variety of purposes. It is essential for all. Mathematics is everywhere in our daily life activities from dawn to midnight. It is in everyone's life from birth to death, from the creation of universe to today's modern world, from home to society. That is why, not only today, but from ancient times, learning of mathematics is indispensable for all from childhood.

All students must learn mathematics so that they can face the challenges of their day to day life as well for the newly formed technological globe of today and tomorrow. Therefore, Mathematics is an essential subject from the beginning of the school education. Earlier it was a misconception that mathematics is required only for being an Engineer, Mathematician or Scientist and for this reason the subject was treated as a difficult and complicated subject by the society, and school students had a fear for mathematics. But since last few decades, strong efforts are done to make the elementary education a fundamental right for all children.

*Corresponding author: **Sharma Ankita**

Department of Home Science, Dayalbagh Educational Institute (Deemed University), Dayalbagh, Agra, Uttar Pradesh, India – 282005

In spite of such importance at the present time it is regrettable that many students have wrong impressions about mathematics and they dislike mathematical activities; many seem to have fear, even few hate mathematics. For these students mathematics becomes frightening.

Hindering Factors In the Learning of Mathematics

Some students have a fear towards the mathematics. They are unable to understand the basic concepts of mathematics due to various reasons. Some of the probable reasons could be their attitude towards mathematics, not understanding its practical application, large class size, no enough resource materials such as textbooks, reference books and teaching aids, not understanding the application of mathematics in relation to other fields, and these reasons that inhibit students from learning are referred as barriers. In an effort to understand the barriers of mathematics teaching and learning, researchers have focused on many factors (Beaton & Dwyer, 2002; Kellaghan & Madaus, 2002; Kifer, 2002), these problems are broadly classified in three categories i.e. student related, school related, family related :-

Student Related Factors

Lack of self directed learning

Mathematics learning requires a deep understanding of mathematical concepts, the ability to make connections between them and produce effective solutions to ill-structured domains. There is no perfect, well-structured, planned or prescribed system that lets students think and act mathematically. This can be done when students, play their assigned roles in their learning progress. Self-directed learning has an important place in successful math learning. Self-directed students can take the initiative in their learning by diagnosing their needs, formulating goals, identifying resources for learning, and evaluating or examining learning outcomes.

Negative attitude towards mathematics

Negative attitude for mathematics means disliking mathematics and not applying it in their daily life and ultimately parents and teachers discourages students from choosing mathematics as their major subject. These feelings and attitude that sustain a dislike of Mathematics or impede interest in mathematics are great barriers to the development of mathematical skills or abilities. Students develop a fear towards mathematics due to their misapprehension, non-understanding and failure during previous lessons.

Students should have a positive attitude towards mathematics. Parents and teachers should encourage and try to develop the attitude in students towards mathematics.

If students have a positive attitude towards mathematics, it is likely that they will give a large section of their study time to mathematics and try hard to master the knowledge and skills.

Lack of arithmetic ability

Arithmetic ability can be predictor of mathematics learning. Arithmetic ability includes the skills such as manipulating mathematical knowledge and concepts in ways that transform their meaning and implications. It allows students to interpret, analyze, synthesize and generalize the facts and ideas of mathematics. Students with high arithmetic ability can solve

complex problems, discover new meanings and understanding. When there is lack of arithmetic ability in students it hinders the learning of mathematics.

Lack of motivation

Mathematics learning requires highly motivated students because it requires reasoning, making interpretations, and solving problems, mathematical issues, and concepts. The challenges of mathematics learning for today's education are that, it requires disciplined study, concentration and motivation. To meet these challenges, students must be focused and motivated to progress. Broussard and Garrison (2004) examined the relationship between classroom motivation and academic achievement in elementary-school-aged children (122-first grade and 129-third grade participants); they found that for a higher level of mastery, motivation was related to higher math grades.

The role of teachers in motivating students to learn should not be underestimated. The teacher's major instructional task is to create a learning environment where students can engage in mathematical thinking activities and see mathematics as something that requires examination, representation, generalization and verification.

Mathematics Anxiety

Mathematics anxiety is negative for mathematics learning. Mathematics anxiety refers to lose confidence in the subject matter. It affects the students' mathematics learning process. Students feel mathematics is complex subject only for clever students. It has no direct use in daily life. And it is not concerned with other subject (Acharya 2017). Mathematics anxiety directly affects the students to learn well. Students' anxiety of mathematics is responsible for students fail in mathematics.

School Related Factors

Competency of teacher

If teachers are not trained according to their interest, they are forced to teach subjects other than their choices, forced to join the teaching profession unwillingly than it is hard to expect from them to remain creative and motivated in class.

Teachers must have access to continuous professional development through in-service programmes, short term seminars and workshops. This creates an opportunity for them to introduce themselves to new findings of teaching methods, knowledge and skill on how to handle and help students, to promote their competence in the subject, exchange of experience with another teacher.

The classroom management in the elementary classes is in such a way that one teacher teaches all the subjects. There is a possibility for the teacher to incline and spend more time on the subject which he/she is good or interests him/her and not giving enough time to the other subjects. All these teacher related factors could be the base for hindrance in the teaching of mathematics.

Method of teaching

Teaching-learning activities have a great impact on student's achievement; therefore it is necessary to investigate how

effectively teaching of mathematics being carried out in the classroom. Appropriate teaching method can lead the students to master the abstract and symbolic forms of thought much earlier and more systematically. Students learn more efficiently if the teaching-learning methods to meet their requirements.

School infrastructure and environment

School environment and its facilities could be an important factor for student achievement in mathematics. For instance, research suggests that student attainment is connected with a safe and orderly school climate (Saritas 2009). Researchers also found a negative impact on student achievement where deficiencies of school features or components such as temperature, lighting etc. In a study by Harner (1974), temperatures above 23° C (74° F) adversely affected mathematics skills. In terms of the condition of the school building, Cash (1993) found student achievement scores in standard buildings to be lower than the scores of students in above standard buildings. The findings of another study indicated that a high population of students in the school had a negative effect on student achievement.

Quimbo (2010) advised that presence of learning materials such as books, charts and visual aids affects the learning outcomes, it can improve achievement in mathematics.

Family related factors

Home Environment

Home is the first school of the child. Education of children depends on their home environment. Good home environment enhances students' achievement in mathematics. According to Quimbo (2010) Home learning environment such as parental education have a significant effect on students' performance. If family members are uneducated or unaware about the importance of mathematical knowledge in life, they cannot create an appropriate environment at home for learning mathematics to their child. Students' learning in mathematics significantly depends on their home environment.

Support of parents

Parents' support can play a crucial role at all stages of education. When parents play supportive role to their children learning, it is helpful in improving students' learning and achievement. Parents achieve support for their child's learning can make good achievement in education. School can benefit from positive partnership with parents by involving decision making. If parents are unable to support children in learning mathematics, children of those families are not interested to learn mathematics due to lack of family support.

According to Ghimire (2011) family support plays a vital role in children's education. Students need and interest are determined by their family support. Students, who could not get support from their families, did not pass in mathematics. Hence this is one major cause of low students' passes rate mathematics in school level.

CONCLUSION

It came to the conclusion that there are a number of combined factors that are damaging performance students in mathematics. These barriers are playing major role in blocking, the teaching

learning process directly or indirectly. As the teaching learning process directly reflects the quality of education, these barriers distress the improvement of mathematics education quality. Students lacking excellence in mathematics can lead distress of quality of education as well as development of the whole nation. So, it should eliminate barriers to make mathematics learning enjoyable.

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