

“A study of Secondary and Higher Secondary Mathematics Teachers’ Opinions towards the Mathematics Laboratory”

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Abstract

The learning style of children is not same universally. Mathematics laboratory may prove to be one of the important step to improve understanding in the subject of mathematics .It will consequently improve the standard of education in other branches also as the subject has applications in every branch of knowledge. Some of the educational boards have made it mandatory to have laboratory in their schools but S.S.C board of Maharashtra state yet hasn't taken concrete decision about it. The reasons for this could be innumerable; ranging right from the doubts of its utility to the cost of its establishment. With the changed focus on student as the centre of teaching-learning process, it would be useful to find out what the teachers feel about having a mathematics laboratory. In the present paper an attempt has been made to find out the opinions of the teachers towards mathematics laboratory. What would be their reaction if it is made available to them? Do they think of it as welcome move and would they see mathematics lab making any positive changes in the ways that mathematics is taught in the secondary and higher secondary schools.

KEYWORDS: Mathematics lab, Mathematics Laboratory

Introduction

Mathematics, according to National Education Policy 1986, should be visualized as the vehicle to train a child to think, reason, analyse and articulate logically. Apart from being a specific subject, it should be treated as a concomitant to any subject involving analysis and reasoning. Does our mathematics teaching in schools comply with these expectations? Modern technologies have changed the way the subjects are taught. Learning these days takes place with students getting opportunities to express their ideas, they need to be actively involved in the process of teaching learning and efforts to give hands on experiences must increase because it is finally the active learning that stays with the children forever. In order to facilitate learning it is necessary to create opportunities where there is a possibility of getting immediate feedback from teachers and peers. Any laboratory for that matter creates such opportunities, and mathematics lab is no exception to this. In a regular classroom, students don't get time to reflect they just listen and mug up with understanding causal relationships. That is the reason why the higher order skills of analysis, synthesis don't get developed in them. Sometimes this even leads to hatred towards mathematics. It is felt that Mathematics laboratory would build right attitudes towards the subject and give long term benefits to the learners. Let's try to understand

what is mathematics lab? When thinking of Mathematics Laboratory, one really imagines big charts, calculators tablet PCs, puzzle books, toys based on mathematical logic, various geometrical shapes, blocks etc. Guidelines given by C.B.S.E. defines Mathematics laboratory as, **“a place where students can learn and explore mathematical concepts and verify mathematical facts and theorems through a variety of activities using different materials.”** These activities may be carried out by the teacher or the students to explore, to learn, to stimulate interest and develop favourable attitude towards mathematics. Access to quality mathematics education is every child’s right. On the other hand, mathematics education in schools is based with problems. Due to hierarchy of concepts & largely deductive & abstract nature of the subject mathematics is considered as a very difficult subject. Taking into consideration the national aspirations & expectations reflected in the recommendations of the national curriculum framework developed by NCERT many educational boards & educational bodies have been initiating number of steps to make teaching & learning of mathematics activity based & experimental oriented.

Significance & purpose of Study

Today after teaching mathematics at degree level for more than 16 years, it is realized that the number of students offering mathematics as a major subject is decreasing year after year. Some of the available students are also lacking basic mathematical concepts. How did this happen? How did we deteriorate the standard of teaching mathematics? If our nation is really dreaming to be a superpower this is the time to find answer for the question.

A phobia has been created in the minds of children that mathematics is tough, as a result children are losing interest in the subject & might be a cause of high percent of students failure in the subject. The stamp “Fail” creates personal problems and sometimes leads to social problems too.

If our nation wants to emerge as a superpower mathematics is very important subject, as today’s era is the era of technology & technology requires a strong mathematical & logical background.

The failure percentage can be reduced & standard in the subject can be improved by building interest & by improving understanding in the subject. Using innovative methods, having mathematics laboratory might be able to help us in this regard. Even the teacher – students relationship might improve as a result of hours spent in the lab under close supervision and changed roles of the teachers. Strong bonding between them will increase the confidence level of students. Usefulness of the concept “mathematics laboratory” therefore is put to study here to ensure what the teachers of mathematics feel about the concept.

Objectives:

Following were the objectives of the study:

1. To study the essence of Mathematics Lab as perceived by the Secondary and Higher Secondary Mathematics teachers.
2. To find out the opinions of the Secondary and Higher Secondary Mathematics

- teachers towards the utility of Mathematics lab.
- To study the willingness of Secondary and Higher Secondary Mathematics teachers to devote time for Mathematics lab.
 - To study the effect of Mathematics lab on teacher-pupil bonding.
 - To find out managements willingness to establish Mathematics lab as perceived by Secondary and Higher Secondary Mathematics teachers.

Methodology & Sampling:

For the present research falls under the Descriptive survey method has been used. The population for the study was Aided Secondary and Higher secondary teachers of Mathematics. Random sampling was used to identify the schools. 18 number of schools were randomly selected & 83 teachers were surveyed. Self made validated tool was used.

Limitations and delimitations:

- The present study is delimited to Mumbai region only.
- Information of improved results about standard, marks & support (if any) in the schools in which mathematics laboratory has been already installed is unavailable.
- All the school teachers which are included in the sample are from Mumbai region

Statistics of Data:

The following table gives percentages of teachers' opinions about the various major aspects & benefits about mathematics laboratory.

Table of teachers' opinions

Aspects	yes	no	unclear
Students interest in Mathematics will increase & they will welcome Mathematics Lab.	84.34	6.02	9.64
Mathematics Lab will lead to better concentration & better understanding of the subject.	86.75	4.82	8.43
Students' achievement will be better if Mathematics lab made available.	83.13	3.61	13.26
A teacher always feels he could have done better if he had a Mathematics Lab.	86.75	6.02	7.23
Mathematics Lab will help to built stronger bonds between teacher and students.	83.13	7.23	9.64
My organization will support me in establishing Mathematics Lab.	46.99	12.05	40.96
Traditional methods of teaching mathematics are the best and should be continue.	42.17	44.58	13.25

Findings:

From the above statistics, following inferences are derived.

- Most of the teachers have shown positive gesture towards the establishment of mathematics lab.
- Positive response of the teachers demonstrates that establishment of mathematics lab is an effective means of reinforcing learning process particularly for those students who are not able to understand concepts of mathematics by the traditional methods of teaching.
- Standard of education & marks in the subject of mathematics are expected to improve.
- Mathematics lab will increase students' interest in the subject.
- Few teachers insisted that effective combination of both conventional & mathematics lab will give more insight into the subject.
- Teaching community is reluctant in answering whether the management support will be provided.

Conclusions:

Mathematics laboratory is important for upgrading the understanding capacities of students coming from all sections and this will help to match with the international standards of the subject. All educational systems are knowledge based. These labs are of great significance in enhancing the understanding process. Hence, all educational boards & institutes should go forward to construct a mathematics laboratory for the better development in the subject & better academic growth of student community. This will be really a big step towards a dream of 'India, The super power in 2020' envisaged by Dr. A.P.J. Kalam.

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