USE OF MATHEMATICS LABORATORY FOR TEACHING MATHEMATICS

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*The study developed a strategy for of teaching Mathematics in a Mathematics laboratory. It found use of Mathematics laboratory was more effective tahn the tarditional meth**od.***

INTRODUCTION

Mathematics, according to National Education Policy 1986, should be visualised 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. With the introduction of computers in schools, educational computing and emergence of learning through understanding of cause-effect relationships and the interplay of variables, the teaching of Mathematics will be suitably redesigned to bring it in line with modern technological devices so that learning takes place effectively. Learning often takes place best, when students have opportunities to express ideas and get feedback from their peers. Feedback, to be most helpful to learners, must consist of more than the provision of correct answers. It ought to be analytical, to be suggestive, and to come at a time when students are interested in it. And then there must be time for students to reflect on the feedback they receive, to make adjustments and to try again -a requirement of Mathematics education that was neglected due to rigorous use of traditional methods of teaching. The traditional methods of teaching are no longer adequate to meet the demands of modern Mathematics education. In order to develop the skills reiterated in the policy and to provide practical experience of mathematical concepts, assumptions, assertions and rules, a strategy for teaching mathematics and a suitable platform to use such strategy is the need of hour. Every student has a unique way of thinking, learning and making sense of what s/he listens or observes. His/her active imagination constantly builds new connections. It assimilates new information. If the teacher is active speaker, the learning takes backseat and in the process, some faulty ideas can also form and lead to several learning gaps. These learning gaps need to be identified, questioned and corrected before they result into misconceptions. These misconceptions lead to low self- efficacy among students resulting low performance in the subject of mathematics. Learner learns faster, when s/he is influenced by his/her peer group. The role of teacher is reduced to facilitator. However to reduce the role of a teacher to facilitator, a change in methods of teaching is inevitably seen. A strategy for teaching Mathematics in a Mathematics Laboratory atmosphere that would transform the position of the teacher from being active speaker to facilitator of learning is the need of the hour. Hence this experimental study was taken up.

OBJECTIVES

To study various methods ofteaching Mathematics in regular classes;
To study teachers' opinions about Mathematics Laboratory
To develop a strategy for use in a Mathematics Laboratory set – up a

HYPOTHESIS

There is no difference between teaching Mathematics through Traditional Methods of teaching and teaching through a strategy developed for teaching mathematics in Mathematics Laboratory atmosphere.

METHOD
Assumptions

Teachers are not using Mathematics Laboratory as an alternate platform for teaching Mathematics.

Variables
Independent variable was the use of strategy evolved in a Mathematics Laboratory to teach Mathematics and the dependent variable was performance of students.

Sample
For this experimental study purpose, two different samples were chosen. The sample of the study consisted of a total of 80 students of class X standard of Kendriya Vidyalaya, Ojhar and 100 teachers of Mathematics working in schools in and around Nasik. The sample of 80 students was divided into two groups: controlled and experimental, matched on the basis of their marks obtained in class IX on the basis of continuous and comprehensive evaluation.

Tools
Questionnaire consisting of 18 questions and Interview Schedule

Procedure
Questionnaire was constructed and administered among 100 secondary teachers. On the basis of the data gathered and analysis made, interviews of teachers was carried out, besides making online interviews with Laboratory heads abroad. Mathematics Laboratories located in different parts of country including the one in NCERT, New Delhi. While selecting the teachers on simple random sampling method, it was ensured that majority of teachers selected were secondary teachers, who were in touch with class 10th contents of Mathematics.   The researcher visited the Mathematics Laboratories functioning at NCERT, New Delhi and a few other Laboratories located in different part of the country. The responses to the questionnaire were analysed. A strategy consisting of three methods: Expository method, Cooperative Learning Method and Problem Solving method coupled with Modelling was developed.   The strategy developed was used by the researcher for 10 weeks on the experimental group of the sample to teach mathematics in a Mathematics Laboratory atmosphere; whereas, the control group was taught the same Mathematics content using normal classroom teaching.   The lesson plans (excluding the method of teaching and Mathematics Laboratory), worksheets and modules were the same for both control and experimental groups. At the end of 10 weeks, a post-test was administered to both groups to evaluate and assess the performance of students. The data gathered through questionnaire and post-test administered on students were analysed.

RESULTS AND DISCUSSION
The difference between the mean scores of Experimental Group and Control Group on posttest was quite significant. The t – value statistically arrived was 5.59. The degree of freedom was 78 for which the level of significance at 0.05 level was 2.00; while the level of significance at 0.01 level was 2.66. Hence, t- value statistically arrived was greater than the levels of significance at both 0.05 and 0.01. Hence, the strategy developed for the purpose of teaching mathematics in a Mathematics Laboratory atmosphere was effective. Hypothesis was rejected on the basis of statistical inference drawn. It was concluded that the strategy evolved to teach Mathematics in a Mathematics laboratory was more effective than the traditional methods of teaching.

CONCLUSION
Mathematics Teaching could be carried out in a Mathematics Laboratory by integrating mathematics laboratory into regular curriculum. The strategy developed was a new way of

teaching Mathematics. Mathematics teachers could be provided ample training in using this strategy, by inducting this strategy in teacher training curricula.

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