

# EMPIRICAL RESEARCH IN STATISTICS EDUCATION

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## **Abstract**

*Study of mathematics helps in developing proper moral attitudes also, as there is no place for prejudiced feelings, biased outlook, doubts etc. in the learning of this subject. The qualities like honesty, justice, punctuality, self-confidence etc. indirectly gets inculcated through the teaching and learning of mathematics. These qualities help in the development of morality and sound character. Some people wrongly consider mathematics as un-artistic and non-aesthetic. But, for a true student of mathematics it is all beauty, symmetry, balance, harmony, art and music. Music is nothing but mathematically organized sound. Leibnitz has rightly said, "Music is a hidden exercise in arithmetic of a mind unconscious of dealing with numbers".*

*The purpose of this study was to gather data and other related information on the teaching of mathematics in the secondary schools of Bhopal, and to make a systematic analysis of these materials. This serves as a means of looking at the methods of teaching and noting certain provisions that are made in the mathematics program. Some of the related literature in recent professional books, periodicals, government publications and the national yearbooks were examined in order to get an overall look at the secondary school program, nationally. A summary of this material was made. The main aim of the study is to gather data relating to the status of the secondary school mathematics program in Uttar Pradesh, to analyze the data in appropriate form and present the findings in a full report and to review some of the related, current literature on mathematics curricula, methods and evaluation of student learning.*

*The questionnaires were mailed to the principals of the schools selected. They with the mathematics teacher(s) were asked to complete them. The questionnaire consisted of three parts*

*(1) Part I, covering certain items about the school, the faculty and some administrative provisions related to mathematics classes^ (2) Part II, on methods of presentation of materials and evaluation of pupil progress; and (3) Part III, on libraries, special rooms and equipment.*

*Research on the problem was confined to the secondary schools of Uttar Pradesh. The study was limited to the courses comprising the mathematics program in grades nine, ten, eleven and twelve. There were about 300 schools teaching up to and including work at the grade twelve levels. This included all private and Indian schools as well as the public and separate schools. There were some others teaching up to grades nine or ten but these were not included in the study.*

*Keywords: Cognitive Processes, Achievement Outcome, Professional Development Program Statistical Literacy.*

## **Introduction**

The opinion of the members of the staff of the Department of Mathematics, University of Uttar Pradesh, is indicated by The shortage of qualified mathematicians in industry and in universities is now acute and likely to become worse\* More students than ever before must enter our honor schools of mathematics, and these must receive their basic training in the high schools. If the supply of highly trained scientists and engineers in the top levels of design and development and in the operation of elaborate electronic equipment of today is to continue, the high schools must perform the task of setting these young men and women on the high academic road. A course of mathematics with a modern flavor is a good foundation on which to build a sound scientific education.

This increased need for people with an interest in and knowledge of mathematics is widespread. There are, "many areas of business, such as accounting, data processing, and decision making by administrators, making increasing use of mathematics, quite often the newer mathematics.

## **MATHEMATICS**

Mathematics is a science of calculation, a science of space and numbers and a science of estimation, greatness and course. Truth be told, the significance of the word mathematics is 'the

science wherein calculations are prime". Along these lines, based on these suppositions of mathematics, one can say that mathematics is the science of numbers, word, sign, and so forth., with which one can think about greatness, bearing and space.

Mathematics is a fundamental basic instinct. Qualification - unrefined or refined, is basic in different backgrounds. An individual without numeracy is significantly handicapped in the battle for survival. Mathematics holds a focal position in the field of knowledge and advances each part of knowledge by its refined techniques and methodologies towards precise qualification.

The term 'Mathematics' can be characterized in number of ways Generally there are numerous meanings of Mathematics. One of the definitions highlighted in National Policy on Education (1986), states: "Mathematics ought to be pictured as the vehicle to prepare a kid to think, reason, examine and articulate logically. Aside from being a particular subject it ought to be treated as an attendant to subjects including investigation and significance."

A teacher of Mathematics who needs to be effective must produce an adoration for mathematics among his students. Love for mathematics can be made once the students comprehend its utility. Practically all science subjects bear some connection with mathematics. A decent establishing in Mathematics is a sine qua non for understanding different sciences appropriately. The extent of mathematics envelops highlighting the role of mathematics in varying backgrounds, producing numerical awareness among all and focusing on its utility for the investigation of different subjects. Education was for the classes and was never implied for the majority up to: the nineteenth Century. Today mass education is basic in the developing nations. The genuine effectiveness of the mathematics teaching relies upon their capacity, "... to insert numerical education into the particular social 4 settings of these nations"

Mathematics is a logical orderly perspective. It is something conceptual drawn from the genuine experience. It is highly conceptualized. More out of control has compactly portrayed the slow advancement of numerical ideas.

### **Definitions of Mathematics**

Mathematics is gotten from Greek words 'Manthanein' which signifies 'learning' and 'Techne' which signifies 'a specialty of technique'. Thusly, mathematics implies the specialty of learning

identified with disciplines or resources. The lexicon importance of mathematics is that it is either the science of number and space or the science of estimation, amount and size. Mathematics is, in this manner, characterized as the science of amount, estimation and spatial relations. It is a systematized and sorted out part of science. It manages quantitative realities, connections just as with problems including space and structure.

### **Characteristics of Mathematics**

Mathematics has certain extraordinary highlights which one could scarcely discover in different disciplines. Coming up next are the significant characteristics of Mathematics.

- Precision and Accuracy
- Logical sequence
- Symbolism

### **REVIEW OF WORK**

Man is the main animal that could be profited by past experience and that does not leave to start over again in each age. He can exploit the knowledge which has been gathered as the centuries progressed. This reality is quite compelling in research which works as a nonstop capacity of nearer and nearer guess to reality. The specialist can make sure that his problem of examination does not exist in a vacuum and extensive work has been done as of now on the problems which are legitimately identified with this proposed examination. The accomplishment of his efforts will depend in no little measure on the degree to which he profits by the development made by the previous examines.

**Amorim (2004)** performed activity inquire about with the points of improving primary school student teachers (STs)' comprehension of, and demeanors towards Mathematics. The teaching systems used to help STs improve their comprehension and frames of mind towards Mathematics were like the ones recommended for their future use in teaching youngsters. The data showed that most STs improved their comprehension. Some likewise said that they had improved their preference for the subject and their comments unmistakably showed an association between the full of feeling and psychological areas. However others said that their frames of mind towards Mathematics had not changed much. The two fundamental points of this

activity research stay incongruent in the view of a portion of these STs. There is no critical distinction in the teacher's frame of mind towards Mathematics as far as sex.

**Manju Krishna (2004)** had led "an examination on effectiveness of methodologies including numerous knowledge hypothesis on the accomplishment in mathematics at higher secondary level". The motivation behind the examination was to think about the effectiveness of systems including various insight hypothesis on mathematics at secondary school level with reference to instructional objectives. The scientist embraced experimental method for the present investigation and chose the pre-test and post-test non comparable gathering plan for the examination. The devices utilized were exercise transcript numerous insight hypothesis is more effective than present methods of teaching on accomplishment on mathematics and procedures including various knowledge hypothesis were effective than the present method under instructional objectives.

**Woodward (2004)** - In the 1970s and 1980s the focal point of scientists turned into the way toward teaching and the subsequent student results or items. This wound up known as procedure item look into. Politically, it additionally ended up significant during this time period to utilize standardized tests as a focal ward measure. As indicated by Woodward, one persuasive research model from this time period was The Missouri Mathematics Effectiveness Project that concentrated the connection between explicit teaching behaviors and improved execution on standardized tests. The administration financing of comparative investigations turned into a showing of the government's promise to educational value; be that as it may, utilizing scripted materials put a colossal weight on static educational plans that permitted couple of freedoms for the individuals who were teaching. Woodward (2004) noticed The Bush organization's No Child Left Behind Act of 2001 expanded the level of responsibility in government funded education. Also, the idea of deductively based research started to direct practices in schools. After a long history of decentralized education, the central government started to compel the hand of teachers the nation over in light of the responsibility development. As the present tenor of education recommends, the demeanor of change is again being sanctioned through the development and appropriation of the Common Core Standards in Mathematics.

**Reynaldo Lagasca Duran (2004)** examined 'Mathematics teachers' capability in connection to students' presentation in national high schools'. Objective: To discover the capability of mathematics teachers and its connection to the exhibition of students in mathematics in the National High Schools during the school year 2003-2004. This was to guarantee the preparedness and ability of these teachers in completing the central objective of the 2002 Basic Education Curriculum (BEC) in the nation, which is the development of practical proficiency among the learners. The yield of the investigation was imagined to turn into a valuable premise in creating an assessment device for teachers' ability to enhance the standard examination framework for teachers' exhibition. Method: Survey method was received for this examination. Discoveries: (I) The mathematics teachers were especially able with mean of 4.24 as seen by the students and much able with mean of 4.02 as seen by the teachers regarding relational abilities. They were especially equipped with mean of 4.25 as seen by the students and much capable with mean of 3.85 as seen by the teachers as far as problem solving and basic reasoning. Regarding supportable utilization of assets and profitability, they were much capable with methods for 3.91 and 3.73 as seen by the students and the teachers individually. As far as development of self and a feeling of community, they were particularly skillful with methods for 4.41 and 4.22 as seen by the students and the teachers separately. They were much capable with methods for 3.83 and 4.02 as seen by the students and the teachers individually regarding extending one's reality vision. By and large, the mathematics teachers were much capable as seen by the students and the teachers with by and large methods for 4.13 and 3.97 individually. (ii) There was no huge distinction between the view of students and teachers on the skill of the mathematics teachers. The registered t-values of 0.28 for relational abilities, 0.50 for problem solving and basic intuition, 0.23 for economical utilization of assets, profitability 0.17 for development of self and a feeling of community and 0.23 for extending one's reality vision did not surpass the organized t-value of 1.96 which means not noteworthy. (iii) The exhibition of students in mathematics during the first and second reviewing periods was normal with methods of 2.72 and 2.85 individually. When all is said in done, the presentation of students in mathematics was normal with generally speaking mean of 2.79. (iv) There is a critical moderate connection between the ability of mathematics teachers and the exhibition of students in mathematics. The figured r-value is 0.59, which shows moderate connection, while the processed t-value is 12.16 surpassing the organized t-value of 1.96, which means noteworthy.

## SCOPE OF THE STUDY

Research on the problem was kept to the secondary schools of the territory of Uttar Pradesh. The examination was constrained to the courses involving the mathematics program in grades nine, ten, eleven and twelve. The schools in the examination were taken from the rundown of Model Secondary Schools in Uttar Pradesh, which is distributed yearly in December, by the Provincial Department of Education.

There were around 300 schools teaching up to and including work at the grade twelve levels. This incorporated all private and Indian schools just as people in general and isolated (Parochial) schools. There were some others teaching up to grades nine or ten however these were excluded in the examination. For data assembling a subjective sample of 170 schools was drawn, which is around 37 percent everything being equal.

## CONCLUSION

India has advised education as a fundamental appropriate for all youngsters between six to fourteen years empowering them to legitimately request education from the administration by methods for the Right of Children to Free and Compulsory Education Act, 2009. In such conditions the importance of giving quality education at school level in all subjects can't be undermined. To the education that that school kids get it must be focused on that a quality mathematics education must be a necessary piece of their learning knowledge. Consequently examine in mathematics education remains a proceeding and crucial need in the educational situation.

It is a feasible end that teachers in the bigger schools had a general higher degree of scholastic preparing in mathematics, and that they teach their subject full time or a huge part of that time. These ends are not characteristic in the data of this report.

Scarcely any speculations have no exemptions. That seemed, by all accounts, to be genuine regarding the secondary school mathematics program in Uttar Pradesh. From perusing the returned questionnaires it was noticed that there were outstanding schools in every size classification. These were normally connected with the character, excitement and devotion of the heads and teachers. There were, additionally, a few insufficiencies. Both of these exemptions do

have some relationship to the physical provisions or absence of them. Yet, one gets the impression that there is much advantageous and true effort given to the teaching of mathematics to Uttar Pradesh youth.

In the present situation there is a need for numerical alternate way method of instructional system for future students. This Multimedia module is helpful for students in increasing long haul memory, winning focused assessments and exceptionally significant placement tests. Accordingly, the legislature should focus on the higher secondary school education particularly to mathematics subject for improving student's community strength, intrigue and inclination in mathematics subject.

#### Frame of mind towards teaching Mathematics

- This demonstrates that, the teachers with more knowledge can tackle problems effectively in the classroom and less capable teachers, having negative frame of mind escape from solving the problems in classroom. They additionally develop negative frame of mind towards the subject. It is suggested that mathematics teaching method might be offered direction to make positive frame of mind towards the subject
- The secondary school teaches content fitness, capability demeanor towards teaching are the predictors of the learners accomplishment at secondary level. It implies that the teachers having these capabilities can teach effectively. Fundamental Education is the establishment for structure of education. So the Government genuinely can consider the arrangement of teachers to teach mathematics with qualified coaches. This will empower to think about the pointers of value education.

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