Research Paper Education

A Diagnostic Study of Common Errors Committed by Viii Class Students in Geometry

* P. Vijaya Bhaskar

* Research Scholar, Research Center: S.T.P.M. Govt. I.A.S.E.; Nellore, Department of Education, S.V. University, Tirupati

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1.1. Importance of Mathematics

"The progress and importance of the mathematics are linked to the prosperity of the state" - Napoleon.

This statement says that development is linked with mathematics because it is a science of logical thinking and systematic reasoning. It is an abstract science which involves both deductive and inductive way of investigations. Mathematics inferences, results and conclusions are based on a definite abstract of logical thinking and reasoning. Mathematics also called as "Science of results and conclusions". The great American mathematician like Boneman and Plers stated that mathematics is the science that draws necessary conclusion. Therefore, any individual should habituate good mathematics thinking which establishes a good foundation for reasoning thinking, and to draw necessary possible conclusions. That is why learning of mathematics has gained an important role at all stages of education and it is above all disciplines.

The civilization and industrial development of a nation indicates its advancement in mathematics. Scientists may not be able to design and manufacture many of modern essentials like Electrical goods, Electronics items, Machines for various purposes, Sea and Air transportations, Satellite launching, even in the latest computer software without mathematics. An Engineer builds Bridge, an Astronomer tells the occurrence of Solar sequences, a Navigator predicts the accurate time and destination and thus the mathematical knowledge reflects the custom, the habit of life, the mode of living and future outlook of the world.

Internal structure of mathematics of external universe has been a source of inspiration of mathematical improvement. Most of the people consider mathematics is used only for the study of other disciplines, and its is the backbone of science and technology. The Kothari Commission rightly expressed that mathetmatics should be taught on a compulsory basis during the first 10 years of schooling. Hence, majority of states in India and Control Board of Secondary Education (CBSE) have included topics of modern mathematics in the Syllabi at the secondary school level.

Mathematics is also widely used in education, medical, health, economics, biology, social sciences, and in research mathematics has its own light, bliss and wisdom.

In general teachers and students feel that mathematics is a difficult subject. No doubt mathematic in view of its abstractness offers greater difficulty to expose than any other science. Research in mathematics is mainly for those people who are interested to drive into intellectual oceans to collect gems. We can learn to play guitar by watching and hearing a concert but not mathematics.

Mathematics gives challenge to those who are educated. The great mathematician Bajpai said that `Rene Decartes'. Invented basic ideas of analytical geometry from his dream on the night of 10th November 1619. The great Indian mathematic genius Ramanujam used to say that, "The goddess of nominal inspired him within the mathematical results." In his dream the bright idea of famous principle of Archimedes came to Archimedes when he was taking his bath. Weiastrass, a great mathematician once remarked that a mathematician who is not also something of a plot will never be a complete mathematician. Fortunately another mathematician pointed out that mathematicians are like lovers.

The concept and structure of mathematics provides a strong base for understanding and talking the problems of a dynamic society as it is said that `**mathematics is a living and never growing subject and not deed and frozen product of antiquity.**

Different branches of new mathematic have been developed under applied in variety of disciplines like computer mathematics game theory of linear programming, set theory etc. Hence, the importance of mathematics has tremendously increased. It can be concluded that "all mathematic arose from necessity".

Mathematics, a way of describing relationships between numbers and other measurable quantities. We benefit from the results of mathematical research every day. For the most part, Mathematics remains behind the scenes. We use the end of results without really thinking about the complexity underlying the terminology in our liver changes in society and the work place require greater skill and under standing of mathematics.

Bell (1951) says that "Mathematics is the handmaid and servant of all sciences".

Gauss said that "Mathematics is the queen of all sciences".

The developments in various occupations, industry and other fields own much to the developments in mathematics. Social scientists also use mathematical techniques, primarily probability and statistics.

Napoleon states that "The progress and the improvements of Mathematics are linked to the prosperity of the state". It is said to be mirror of civilization.

Albert Einstein the founder of relativity theory writes "Our experience hither to justifies us in believing that nature is the realization of the simplest conceivable mathematical ideas".

Camte (1987) says, "It is only through Mathematics that we can thoroughly understand what true science is".

Mathematics, the language of science, has two dialects, pure Mathematics and applied Mathematics. Pure Mathematics is the study of abstract relationships where as applied Mathematics applies mathematical analysis to real-world problems. Mathematics strive for simplicity and generality. Simplicity means the use of minimal number of assumptions or hypotheses in a proof or theory. Generality is the ability to apply the mathematical theory to different situations.

The subject Mathematics has been gaining an important role in school curriculum. Mathematics by virtue of its extensive practical applications and the aesthetic appeal of its methods and results, has long held a prominent place in Education. Stone stated that "Mathematics seeks not to find new place in new place in the curriculum but to adjust its place in education in accordance with its growing importance in contemporary life". With availability calculators and computers higher order thinking is basic skill for all students.

The Kothari Commission Report (1964-66) rightly points out that the study of Mathematics plays a prominent part in modern education. It plays an important role in the development of physical sciences and biological sciences. One of the most exciting features of intellectual life in the 20th century is the penetration of Mathematics into an over widening circle of scientific disciplines not only pure and applied sciences, but also devoted to the study of human behavior.

It is believed to be relatively difficult to learn. Mathematics is the Achilles heel for a great majority of the pupils. It can not be learnt without proper grounding in fundamentals. Without proper training in fundamental concepts we cannot go deep into the subject.

1.2 Statement of the Problem

The present study is meant to diagnose the causes of errors in mathematics committed by the students of class of VIII is selected schools in Nellore District.

The study is designed to determine the types and frequencies of errors committed by the pupils with a view to suggest remedial measures in related to different variables.

1.3 Title of the Problem

The title of the problem is "A Diagnostic study of common errors committed by VIII class students in Geometrical Concepts"

1.4 Objective of the Study

The study outlines the following objectives

1. To Study the relation between students in Government Schools on the errors committed.
2. To study the relation between students in private schools on the errors committed
3. To study the relation between government and private management schools on the errors committed
4. To study the relation between boys and girls in rural area on the errors committed
5. To study the relation between boys and girls in urban area on the errors committed
6. To study the relation between boys and girls in government schools on the errors committed
7. To study the relation between boys and girls in private schools on the errors committed

1.5 Hypotheses of the study

The following null hypotheses have been set up for the investigation

1. There is no significant difference between mean errors committed by students in government school
2. There is no significant difference between mean errors committed by students in private school
3. There is no significant difference between mean errors committed by students study in school under government and private management
4. There is no significant difference between mean errors committed by boys and girls in rural area
5. There is no significant difference between mean errors committed by boys and girls I urban area
6. There is no significant difference between mean errors committed by boys and girls in government schools
7. There is no significant difference between mean errors committed by boys and girls in private schools

1.6 Variables Studied

These are the following variables including in the study are

1. Sex
2. Different types of managements of schools i.e., government management and private management.
3. Geographical factors i.e., rural and urban areas

1.7. Analysis and Interpretation of Data

1.7.1. Comparision of Errors Committed by Students of VIII Standard studying in Government and Private Schools

Ho : There is no significant difference between mean errors of students of VIII standard studying in schools under government and private management. Means, S.D.s and `t' value of the errors committed by government and private management students are given in table - 1.

Table - 1

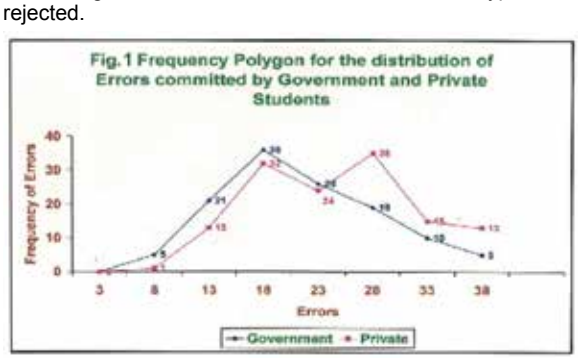
Means, S.D. and `t' value of errors committed by government and private schools

Management	N	Mean	S.D	t-value
Government	120	28.16	6.262	9.59**
Private	120	21.12	6.983	

**** t is significant at 0.01 level for 238 df.**

The difference between two means of errors of Private and Government school students was tested for significance by 't' test. The obtained `t' value is 9.59. The table value of `t' for 238 df is 1.97 at 0.05 level and at 0.01 level is 2.60. The obtained value is greater than the table value.

So,'t' is significant at 0.01 level. Therefore the null hypothesis rejected.



1.7.2 Comparision of Errors Made by VIII Standard Boys and Girls in Rural Area

Ho: There is no significant difference between mean errors of boys and girls in rural area. Means, S.D.s and `t' value of errors made by boys and girls in rural area are given in the table - 2.

TABLE-2

Means, S.D. and `t' value of the errors committed by Boys and Girls in Rural Area

Sex	N	Mean	S.D	t-value
Rural Boys	60	22.25	7.171	2.205*
Rural girls	60	25.25	7.767	

*** t is significant at 0.05 level for 118 df.**

The obtained 't' value is 2.205 and the table value of `t' for 118 df. Is 1.98 at 0.05 level. The calculated is greater than the table value. Hence the null hypothesis is rejected at 0.05 level.

So, there is significant difference between the mean errors committed by boys and girls in Rural Area.

1.7.3. Comparision of errors made by VIII standard Boys and Girls in Urban Area

Ho : There is no significant difference between mean errors of boys and girls in urban area.

Means, S.D.s and `t' value of errors made by boys and girls in Urban area are given in the table - 3.

TABLE – 3

Means S.D. and `t' value of the errors committed by VIII standard Boys and Girls Urban Areas

Sex	N	Mean	S.D	t-value
Urban boys	60	26.25	6.995	1.075@
Urban girls	60	24.83	7.473	

@ t is significant at 0.05 level for 118 df.

The obtained `t' value is 1.075 and the table value of `t' for 118 df is 1.98. The calculated is less than the table value. Hence the null hypothesis accepted.

1.7.4 Comparision of errors Made by VIII Standard Boys and Girls in Government Schools

Ho : There is no significant difference between mean errors of boys and girls in Government Schools.

Means, S.D.s and `t' value of errors made by VIII standard boys and girls under Government management are given in the table - 4.

TABLE - 4

Means, S.D. and `t' value of the errors committed by VIII standard Boys and Girls in Government Schools

Sex	N	Mean	S.D	t-value
Government boys	60	27.08	6.677	1.93@
Government girls	60	29.25	5.59	

@ t is not significant at 0.05 level for 118 df.

The obtained `t' value is 1.93 and the table value of `t' for 118 dt. is 1.98 at 0.05 level and 2.62 at 0.01 level. The calculated is less than the table value. Hence the null hypothesis accepted at 0.05 level.

1.7.5 Comparision of errors made by VIII Standard Boys and Girls in Private Schools

Ho: There is no significant difference between mean errors of boys and girls in Private schools.

Means, S.D.s and 't' value of errors made by boys and girls under Private management are given in the table - 5.

TABLE - 5

Means, S.D. and `t' value of errors made by VIII standard Boys and Girls in Private Schools

Sex	N	Mean	S.D	t-value
Private boys	60	21.42	6.95	0.46@
Private girls	60	20.83	7.03	

@ t is not significant at 0.05 level for 118 df.

The obtained 't' value is 0.46 and the table value of `t' for 118 df. is 1.98 at 0.05 level and 2.62 at 0.01 level. The calculated is less than the table value. Hence the null hypothesis accepted.

1.8. Major Findings

From the results discussed in the earlier chapter the findings may be summarized as follows.

1. The mean value of errors committed by students in Govt. schools is 28.16 and by students in private schools is 21.125.
2. The standard deviating of errors committed by students in Govt. schools is 6.262 and by students in private schools is 6.983.
3. The mean value of errors committed by Urban boys is 26.25 and by Urban girls is 24.83.
4. The standard deviation of errors committed by Urban boys is 6.995 and Urban girls is 7.473.
5. The mean value of errors for Rural boys is 22.25 and Rural girls is 25.25.
6. The SD of errors for Rural boys is 7.171 and for Rural girls is 7.767.
7. The mean value of errors made by boys is Govt. schools is 27.08 and Girls in Govt. schools is 29.25.
8. The SD of errors made by boys in Govt. schools is 6.772 and for girls is 5.599.
9. The mean value of errors made by boys in private schools is 21.42 and girls is 20.83.
10. The SD of errors made by boys in private schools is 6.910 and girls is 7.003.

1.9. Conclusions:

Based on the above findings there are the following conclusions

1. On the whole the mean value of errors was higher than that of correct responses.
2. Sex has no significant influence on the frequency of errors committed by pupils of VIII class of Geometrical concepts.
3. Locality has no significant influence.
4. Management of the School has significant influence.
5. There is significance difference between Boys and Girls in Rural area.
6. There is significant difference between Private and Govt. School Students in Urban area.
7. There is significant difference between Private and Govt. School Students in Rural area.
8. Students committed more numbers of errors under the objective "Application" when compared to other objectives.
9. Students committed more number of errors under the content area "Angles".
10. The students and confused greatly with the terminology.
11. Students are very weak in fundamental operations especially in angles.
12. Students are very poor in skills required in Geometry.
13. Students lack of knowledge of different kinds of angles.
14. A great confusion is there is the students on the concepts of different Triangles.
15. Students feel difficulty when they have to apply a suitable concept in problem solving.
16. When the diagrams of a straight line, perpendicular line the right angled triangle were shown in different positions, the students are not able to point out them correctly.
17. Students lack the ability to apply a suitable concept in different situations.

1.10 Educational implications of the study

1. A considerable time must to allotted in the class-room for developing certain skills, followed by drill work with the careful supervision of the teacher.
2. Adequate practice should be given in measuring on angle in drawing parallel lines. The teacher has to guide the pupils when they are drawing diagrams in the class room.

3. How assignments serve a lot in learning any branch of mathematics. But they do not cause the absence of the students to the class.
4. Place of drill work in teaching geometrical concepts and skills.

In order to secure complete mastery in fundamental skills in Geometry, the following principles should be adhered to in planning and conducting drill lessons.

a) Dill to be most effective must be motivated
b) Drill work should be allotted to the student to work according to his own ability and speed.
c) Drill should be specific on skills.
d) Drill exercise should be properly classified so as to ensure psychological order.
e) Proper follow-up activity must be there after the drill work.

5. Motivating the study of Geometry

The use of different mathematical instruments must inculcate interest in the students. The teacher must tell the pupils to prepare different models in Geometry with papers, wood etc.

a) Arousing interest by means of daily use of Geometry

The daily use of geometrical principals such as in laying roads, in constructing building etc; may be quite rewarding. The student may appreciate the wide use of the subject and develops interest with himself.

b) Mathematical recreations

Students find much pleasure in constructing and figures with wood and papers. Most of the Audio Visual aids must be prepared by the students. Such materials should be made valuable aids to teaching.

c) Mathematical games

With the application of the Pythagoras principle many games like finding the height of a hill, ladder on the wall can be explained to the students and they are also asked to find out such heights. These games may be pleasant and successful.

d) Mathematical work shops

Every school must have at least a small mathematical work shop to utilize the students leisure time better. There the students may be asked to prepare the models of cubes, sphere, and different geometrical figures.

e) Role mathematical clubs

Mathematics clubs provide an excellent means of stimulating and fostering interest in the study of Mathematics. It is aimed at the improvement of the quality of the routine class work. The clubs provides opportunity of better co-operation among students and between teacher and students. Some of the useful activities that could be carried out in the club are given below.

1. Useful cuttings of the recent mathematical innovations can be displaced.
2. Mathematical magazines and journals can be displaced in the club.
3. Talks by the experts in specific fields can be given by the members of the club themselves.
4. Time should be spent by the members in preparing teaching aids.
5. Studies of the contributions of great mathematicians; and birthday celebrations of great Mathematicians must be celebrated.
6. Conducting symposia on selected topics of every day importance.

f) Use of Multi-Sensory Aids

Appropriate aids such as charts, models, devices, slides, film-strips, films, flannel graphs, radio and television lessons should be used where ever they are necessary. Uses of programmed learning materials are important in learning fractions.

g) Mathematical Libraries

In the general library are in the Mathematics departments, Mathematics libraries can be exhibited for use by the students. It must consists of text books, specialized books in the fields of Mathematics.

1.11 Suggestions for further Research

1. The present investigation is only confined to a few selected schools situated in Nellore district. It is suggested that a study covering a large sample of schools may be undertaken and the tests be standardized.
2. A similar investigation can be conducted covering more topics from the curriculum.
3. A similar investigation can be carried out for subjects in the school curriculum.
4. This type of studies may be conducted at elementary level and college level in all the curricular subjects.
5. Similar diagnostic students may be conducted for the other high school class in all the subjects.

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