ERRORS IN "PROGRESSION" CONCEPT OF MATHEMATICS AMONG X CLASS STUDENTS

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ABSTRACT

It has been a widely accepted facts that the present learning of Progressions by the pupil is far from being satisfactory. The teachers, due of various reasons are neglecting teaching Progressions. It is seen in almost all the students that they lack adequacy in the knowledge of Progressions, its utility in daily life. A kind of fear, anxiety and hat redness is observed when they have to learn Progressions. The students find difficult to identify the type of Progressions such as arithmetic progression, geometric progression. The pupil get confusion in finding the common difference 'd', n^{th} term in A.P and sum of n term in A.P. The students face problems in using the suitable formulas in solving the problems in A.P and G.P. Imagination in theoretical problems is very difficult to the students level. Progressions problems depend on various formulas which gives importance to memory. So from the above discussion it is felt necessary to identify to difficulties faced by the students in learning Progressions.

Introduction

Mathematics is the mainstay in today's systematic life. Without numerical and mathematical evidence one cannot decide many issues in day to day life. Mathematics plays a vital role in the economic and social development of a country because it is the basis for all science and technology. Mathematics is the queen of all sciences and the backbone of civilization. Doing any profession one cannot survive without the knowledge of Mathematics.

The NPE (1986) identifies the strengths and weaknesses of the present system of education and clearly enunciates the direction for reshaping the system, particularly at school level. There is a specific mention in the NPE (1986) about Mathematics education in the following words " 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 the understanding of cause effect relationship and the interplay of variables, the teaching of mathematics will be suitably redesigned to bring it in live with modern technological devices".

"At the secondary stage, a beginning will be made to teach mathematics as a discipline in a suitable manner. Even then the concepts of essential learning outcomes, minimum level of learning and mastery learning are relevant and valid. Many pupils perform poor in mathematics and find its understanding very difficult. The probable reasons for these are some socio economic factors which have a bearing on the performance of such pupils and the existing school conditions inclusive of its teaching".

Still mathematics can be taught to stimulate the pupils thinking and reasoning. Many geometrical properties that include at the upper primary level/ secondary level can be

discovered by the pupil by doing some simple experiments. These may require teaching aids which can be easily made. Many mathematical rules in arithmetic and algebra can be discovered through patterns.

Mathematics education in schools is more emphasized as it improves concept development, fosters higher cognitive abilities and skills. Mathematics is a very useful subject for most vocations and higher specialized courses of learning. At the higher secondary and university stages, most of the physical and social sciences require the applications of Mathematics. No other subject can be a substitute for Mathematics. Thus Mathematics has now become compulsory in the school curriculum.

Many general tactics of problem solving can be taught progressively during the different stages of school. Abstraction, qualification, analogy, case analysis, reduction to simpler situations, even guess and verify exercises, are useful in many problem solving contexts. Moreover, when children learn a variety of approaches (over time), their toolkit becomes richer, and they also learn which approach is the best children also need exposure to the use of heuristics, or rules of thumb rather than only believing that Mathematics is an 'exact science'. The estimation of quantities and approximating solutions is also an essential skill. When a farmer estimates the yield of a particular crop, he uses considerable skills in estimation, approximation and optimization. School Mathematics can play a significant role in developing such useful skills. Mathematics is the subject which has extensive application in our day to day life situations. It has an important bearing on various aspects of life. Mathematics is an indispensable tool of precision in measure involving quantity and time.

Progressions:

- A progression is a series that advances in a logical and predictable pattern.
- A Succession of quantities in which there is a constant relation between each number and the one succeeding it.
- Progression in Math's can be defined as a sequence of terms that increases in a particular pattern."

Types of Progressions:

Progression refers to increment or progress in a Sequence of numbers in a particular format or following a particular way.

Types of progressions in Mathematics are of 3 types, namely.

1. Arithmetic Progression
2. Geometric progression
3. Harmonic Progression

Need of the study

Progressions is a concept in Algebra. A succession of quantities in which there is a constant relation between each number and the one succeeding it. "Progression in Maths can be defined as a sequence of terms that increases in a particular pattern." Since Progression is the study of different objects and the related mean problems, imagination in theoretical

problems, skills of problems solving. The three fundamental Progressions are Arithmetic Progression, Geometric Progression and Harmonic Progression. Inspite of playing such a vital role in the department of culture development as well as for individual's progress Progression had developed a phobia for it. This can be said, based on the board result of the past few years. The loss of interest in Progression increases day by day. I has a widely accepted fact that the present learning of Progression by pupil is not satisfactory. They are unable to cope up with a subject as they find it difficult to learn. The teachers are neglecting teaching Progressions because it is introduced for first time in tenth class. It is seen in almost all the students that they lack adequate knowledge of Progressions and its utility in daily life. It is seen in almost all the students that they do not possess the zeal to learn Progressions with full interest and enthusiasm, but instead a kind of fear, anxiety is observed whey they are supposed to lean Progressions. Students are face so many problems in Progressions like content difficulty in understanding, apply the concepts of Progressions. The students find it difficult to identify the type of Progression such a arithmetic Progression, geometric Progression. The pupil get confusion in finding the common difference 'd', n^{th} term in A.P. , sum of n term in A.P. and n^{th} term in G.P. Imagination in theoretical problems in very difficult to the students level. Progression problems depend on various formulae, which gives importance to memory.

The researcher' personals experience in teaching of Mathematics at secondary level also helped to identify the problem that the student are trying to avoid Progression questions in their examinations.

So from the above discussion it is felt necessary to identify the difficulties that is faced by the students in learning Progressions.

Objectives of the Study

1. To study the performance of X class students in learning Progressions with reference to the following variables.
    a) Management
    b) Gender
    c) Locality
2. To study the opinion of teachers in learning Progressions by X class students with reference to the following variables.
    a) Management (Government / Private)
    b) Gender (Male / Female)
    c) Teaching Experience (1-15y / 16-35y)

Sample selected for the study:

The sample selected for the study consisted of X class students, Mathematics teachers belonging to private and government schools of Tirupathi and Puttur Mandal. The sample were selected from 25 schools of Tirupathi and Puttur Mandal. Total samples consisted of 200 students and 50 teachers.

Research tools:

The tools were prepared with reference to the objectives and variables selected for the study .the study tools consisted of –

A . An opinionnaire to collect the information regarding the opinion of teachers in learning of

progressions by X Class students.

B. An achievement test to identify the knowledge of progression of X class students

Pilot study:

For a preliminary study, the opinionnaire consisted of 25 items initially, it was administered on the mathematics teachers of secondary school, which comprised of 15 members.

The investigator had personally visited the schools and requested the Head master of the school for the study. In this tool the reliability of it was confirmed by careful inclusion of all the items recommended by Mathematics expects (expert's panel).

Analysis and Interpretation

Hypothesis -1

There would be no significant difference in the performance of X class students in learning progressions with respect to the variables – Management (Government/Private), Gender (Male / Female) and Locality (rural/urban).

Table -1 - Showing the performance of students with respect to Management, Gender and Locality

S.No	Variables	Sub Variables	Total Sample Students	Mean	Standard Deviation	't' value
1.	Management	Government	100	18.11	5.367	3.859 ** P= 0.000
		Private	100	21.10	3.971	
2	Gender	Boys	100	20.70	4.054	3.206 ** P= 0.002
		Girls	100	18.51	5.498	
3	Locality	Urban	100	20.31	4.607	2.033* P= 0.043
		Rural	100	18.90	5.183	

**'t' significant at 1 percent (0.01) levels, *'t' significant at 0.05levels.

Mean values in the above table -1 indicate that the index of the students of private schools is higher than the government schools (21.1 and 18.1 respectively), which means that there is lower level of difficulty and government, private school students had below average performance in progressions. The difference in the average index is found to be statistically significant at 0.01 levels as evidenced by the 't'test. Hence hypothesis is not accepted. It is concluded that there is significant difference between government and private pupils in their performance in Progressions. The values show that government and private school students feel that there is a difficulty among the students to learn Progressions. Mean values in the

above table also indicate that the index of the boys and girls are below average (20.70 and 18.51 respectively) that is both have difficulty though boys are slightly better than girls. But difference in the average index is found to be statistically significant at 0.01 levels as evidenced by the 't'test. Hence hypothesis is not accepted. It is concluded that there is significant difference between boys and girls in their performance in Progressions. The values show that both the boys and girls have difficulty in learning Progressions. Mean values in the above table it also indicates that the index of the students of urban schools is higher than the rural schools (20.31 and 18.90 respectively), which means that there is lower level of difficulty and urban , rural school students had below average performance in progressions . The difference in the average index is index is found to be statistically significant at 0.05 levels as evidenced by the 't'test. Hence hypothesis is not accepted. It is concluded that there is significant difference between urban and rural pupil in their performance in Progressions. The values show that urban and rural school students feel that there is a difficulty among the students to learn Progressions.

Hypothesis – 2

There would be no significant difference in the opinion of teachers in learning progressions by X class students with respect to the variables - Management (government/private), Gender (Male / Female) and Teaching Experience (1-15 Years / 16-35 Years).

Table-2 Showing the performance of students with respect to Management, Gender and Teaching Experience

S.No	Variables	Sub Variables	Total Sample Students	Mean	Standard Deviation	't' value
1.	Management	Government	25	49.00	4.628	2.146* (p=0.037)
		Private	25	51.88	4.859	
2	Gender	Male	27	52.48	4.318	3.535** (P =0.001)
		Female	23	48.04	4.548	
3	Teaching Experience	1 – 15 Years	25	48.76	4.136	2.548* (p=0.014)
		16 – 35 Years	25	51.24	5.134	

**'t' significant at 1 percent (0.01) levels, *'t' significant at 0.05levels.

It is clear from the table -2 that the calculated 't' value 2.146 is greater than the critical value 2.021 for df (48) at 0.05 levels. Hence the hypothesis is rejected. It is concluded that there is significant difference in the opinion of teachers in learning Progressions by X class students with respect to management. It is clear from the table, the calculated 't' value 3.535 is greater than the critical value 2.021 for df (48) at 0.05 levels. Hence the hypothesis is rejected. It is concluded that there is significant difference in the opinion of teachers in

learning Progressions by X class students with respect gender. It is clear from the table, the calculated 't' value 2.548 is greater than the critical value 2.021 for df (48) at 0.05 levels. Hence the hypothesis is rejected. It is concluded that there is significant difference in the opinion of teachers in learning Progressions by X class students with respect to teaching experiences.

Conclusion

The factors such as management, gender and locality have some impact on students in learning Progressions. All students had below average performance in Progression i.e., all most all the students have difficulty in learning Progression. The factors such as management, gender and teaching experience availability have some impact on the opinions of teachers regarding learning Progressions in Mathematics. All teacher samples had positive opinion on difficult faced by students in learning progressions. All most all students were found facing problems in academic standards of problem solving in Progressions. Majority of the students are facing the problems with large number of formulae. Teachers felt that the syllabus /content is hard for the students to learn Teachers opinioned that as Progressions was introduced for the first time in X class pupil face difficulty in learning it. Teachers opinioned that most of the students do not understand the Progressions concepts properly. Teachers felt that phobia on the subject makes them scoreless. From the achievement test it was founds that most of the students were facing problems in the imagination part of theoretical problems. Teachers opinioned that the students do not apply the Progression knowledge in practical life. All most all the students felt very difficult to identify A.P, G.P and to calculate the sum of A.P .They felt very easy to measure common difference in A.P,common ratio in G.P.

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