J. of Ramanujan Society of Math. and Math. Sc. **ISSN : 2319-1023**
Vol.6, No.2 (2017), pp. 85-90

THE PLACE OF PROBLEMS IN THE CURRICULUM OF MATHEMATICS

Narendra Kumar Singh and Ajay Kumar Yadav

Department of Education,
Raja Harpal Singh P.G. College,
Singramau, Jaunpur-222175 (UP) INDIA
E-mail: drnksingheducationist@gmail.com

Abstract: Most of the human activities are objective centered which related with some motives of schooling. The major considerations for which a child is sent to school may broadly be stated as the acquirement of knowledge and skill it requires some means through which the specified aims could be realized. These means provide a basis and guideline so, that the everything done in the schools may become the outcome of the aims and purpose of schooling. These means may be termed as problems place in the curriculum of the school.

Keywords: Curriculum, Problems, Criterion, Example, Puzzle.

2010 Mathematics Subject Classification: 97D01, 97A03.

1. Introduction

In the study of mathematics, problems are indispensable. The teaching of any topic of mathematics cannot be completed successfully without dealing with some problems related to that topic. So, the problem occupies an important place in mathematics. Therefore, while organizing the curriculum of mathematics, due place should be given to the problems. Mathematics differs from other school subjects due to its nature. Its study is meant for the development of logical reasoning and thinking. Problem solving is a good means to evoke logical thinking and surmount difficulties. The problems are exercises linked with the topic and something novel. The efforts to solve the problems provide an opportunity of better understanding and application of learnt knowledge. The presentation and arrangement of problems is the next step after the organization of curriculum or syllabus. So, the problems are linked with every topic and subject. These problems should have bearing not only on the subject matter but also on the human life activities. The practice in solving problems helps in developing mathematical skills and habit of

doing work with speed and accuracy. It also help in developing the ability to apply mathematical facts in different types of situations. The training in problem solving enables the students to attack the problem in a right direction.

Methodology

Researchers has adopted the Analytical methodology for presser study. In this study inculcating views were applying to know how does help the problems in learning of mathematics for students.

Analysis

Researchers has been centered on types and criterions of problems which are following.

2. Types of Problems

In mathematics, generally following types of problems are found:

A. Real Problems

Real Problems are those which are true to life and are directly related to the actual life situations. The solving of real problems helps in training the child to face various new and even unexpected situations in different walks of life. In mathematics, real problems occupy an important place. This type of problems helps in the achievement of the aims of the subject. Therefore, such type of problems is allotted a major share in the curriculum of mathematics so that the opportunity of adequate practice may be available to the students.
A few examples of real problems are:

1. A person has to purchase a bed cover sheet for his bed of size 1.8 mt x 0.9 mt. He wants that bed-sheet should fall ten cms. On all sides of the bed. What should be the length and breadth of the required bed-sheet?

2. The salary of an employee is Rs. 4200. His employer announces a hike of 5% in his salary. What will be his salary after this hike?

3. The printed cost of a colour television set is Rs. 15000. If 10% discount is given by the selling agency to the customer, what will be the actual cost of television set?

B. Unreal Problems

The problems which have no relationship with real life situations and are presented only for the use of mathematical processes, are called unreal problems. The informations contained in such type of problems are false and sometimes misleading. This type of event does not happen in actual situations of life. So, the inclusion

of these problems in the subject matter of mathematics is without any sound basis. But, these are presented in the subject matter as a test of comprehension of mathematical concepts. So, it is assumed that they are somehow helpful in the development of mathematical reasoning.
A few examples of unreal problems are:

1. The price of five tables is the same as that of three chairs and that of four chair is the same as that of two racks. If the cost of five racks is Rs. 2000.00, find out the price of a table.

2. Two pipes can respectively fill a tank in 3 and hours. There is a hole in the bottom of tank which can empty its full water in two hours. If the two filling pipes and hole in the bottom are opened at a time, how much time will it take the tank to fill?

C. Puzzle Problems

The problems which may puzzle the minds of students, are termed as puzzle problems. The solution of these problems can be achieved after much taxing of brain. Therefore, their solution demands much patience. But their intricacy helps in maintaining the curiosity of the student. These problems also offer an opportunity of drill in the mechanical operations of mathematics. So, these problems may be included in small numbers along with other types of exercise because some enthusiastic students will certainly show more interest in this type of problems. This type of problems also serve the purpose of recreation and pastime because their solution is difficult and time taking these problems should not be made an integral part of subject matter but for the development of interest and skill in mathematics a few puzzle problems may be included in the exercise work. The famous mathematics book 'Lilavati' written by great Indian mathematician 'Bhaskara' includes such type of problems in huge numbers.
A few examples of puzzle problems are:

1. **An example from Lilavati.** Two monkeys were sitting on a tree at a height of 100 ft. there was a tank at a distance of 200 ft. from the root of the tree. One monkey went to the tank after coming down from the tree. The another monkey jumped on the tank in the direction of hypotenuse after jumping some height above the tree. If the distance covered by both monkeys to reach the tank was same, find out the height jumped by second monkey above the tree.

2. **Problems Related to magic Squares.** Complete a magic square of 3x3 with the numbers 1 to 9 so, that the sum of the numbers in each row, each column and each diagonals in 15.

D. Catch Problems

Catch problems are those problems, whose solution can be achieved by catching or understanding the meaning of certain word or wards given in them. So, these problems involve jugglery of words. If a student is able to understand or catch the hidden meaning of these words, he becomes successful in solving the problem. Thus, here the purpose is to test the mental alertness of the student. Therefore, to some extent catch problems are similar to puzzle problems but they differ also in many ways. In a puzzle problem the student knows its nature and he understands that his mathematical skills are being tested through the intricate problem. But in a catch problem he is unaware of its exact nature. The student can solve the problem only when he could catch the meaning of the key words involved in it. Secondly, puzzle problems are intricate, long and difficult while the catch problems are less intricate, short and not much difficult. The catch problems are more helpful in the acquirement of objectives of teaching mathematics. These are also good for mental gymnastics and amusement. Thus, these types of problems are useful if they are included in a limited numbers in the subject matter of mathematics.
A few examples of the catch problems are:

1. Ram has double money then Shyam. If Ram has one hundred rupees more than Shyam, what is the total money with them?

2. On a line of length 45 feet, how many soldiers can be placed at every three feet?

E. Criteria of Problems

All the four types of problems discussed above can be included in the subject matter in proper proportions according to the need and purpose of the students as well as subject. But, sometimes unreal and undesirable problems occupy a greater proportion in the subject matter due to ignorance of importance of types and nature of problems. In mathematics, it occurs frequently. Therefore, while selecting and formulating the problems, the following points should be kept in mind by the teachers, book-writers, curriculum planners and mathematicians.

1. It should be real.

2. It should have some practical and social value.

3. It should be related with common life situations and activities.
4. It should have environmental value.
5. It should be helpful in the achievement of general aims of education.
6. It should be in accordance with levels of students.
7. It should be presented in simple and understandable language.
8. It should pose a challenge to the intellect of students but, it should be rational and capable of being solved with reasonable effort.
9. The problems should be interesting and enjoyable.
10. Some problems may be borrowed from other subjects so that a correlation of these subjects can be established with mathematics.
11. The problems should from an indispensable basis for higher studies of the subject and other vocations in future life.
12. Some problems should be based on historical background.
13. The problems must be capable of being realizing the objectives of teaching of the subject.
14. In the presentation of problems the formula of 'simple to complex should be followed.
15. There must be some provision of oral problems to be presented by the teachers in the curriculum.

3. Conclusions

Above analysis shows above problem placing in the curriculum is very important task in the shape of learning of mathematics for students since the majority of students intent to enter into real life such as domestic, occupational, business, government service etc. and only a small percentage of students have a will to acquire higher education so, it is realized by educationist and educational planners that in the curriculum of secondary education the content related to preparatory course of higher education need not be dominated, since after every stage of education some students leave the school and proper to enter in family life or to choose any vocational stream, while others go in for higher education, so the problem place in curriculum should be such as to be able to prepare the students for both streams.

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