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EFFECTIVE TEACHING OF MATHEMATICS BY USING MATHEMATICAL TEACHING AIDS

Dharana Sathya prakash [1] and Kollooru Ravi Kumar [2]

1. ZPPSS Pallagutta, Ghanpur , satya_dharana@yahoo.com
2. Department of Mathematics, KITS, Singapur.

Abstract:

In this paper it is aimed to discuss innovations and innovative practices in teaching of mathematics, the teaching aids plays a vital role in understanding and teaching the mathematics. A good teaching aid is considered to be a good friend for learning. It makes the mathematics simple and sweet. A concept learned by using teaching aid will be easily understood and will be long standing memory to the student. In this paper a simple mathematical teaching aid will be made to prove area of circle and will be illustrated.

Key words : innovative practices, concept , area of circle , mathematical teaching aid

1. Aims of Teaching Mathematics:

Education is aimed to achieve certain goals. Various subjects involves some levels of mathematical back ground, Understanding the mathematics makes easy to learn other subjects. Mathematics is back bone of education.

1. The few goals of teaching mathematics can be
2. To develop the technique of problem solving.
3. To develop scientific attitude i.e. to estimate, find and verify results.
4. To develop mathematical perspective and outlook for observing the realm of nature and society.
5. To develop the mathematical skills like speed, accuracy, neatness, brevity, estimation,etc
6. To develop logical thinking, reasoning power, analytical thinking, critical-thinking.
7. To develop ability to analyze, to draw inferences and to generalize from the collected data and evidences.

2. Need for Innovations in Teaching Mathematics:

The verbal methods that are generally used in class room will only satisfy to give the mathematical rules and memorize them , the students may not understand the concepts and explanations.

By verbal teaching the teachers task will be limited to is to transmit to their pupils the knowledge which has accumulated over the centuries, to stuff their memory while asking them to work exercises, e.g. The rule of signs and formulas in algebra, students memorize this and remember it!

The danger in verbal explanation is the teacher assumes that the mental structure of the child is same as the adult's.

The method of verbal explanation at the initial steps of logical explanations trying to understand and grasp but slowly the gap is created between the explanations transmitted by teacher and received by students which lead to the poor understanding on part of students and they develop a fear of the subject: Mathsphobia.

Hence there is a need for innovations in teaching mathematics.

3. Innovations in Teaching Mathematics:
The few innovative methods in teaching mathematics may be as follows.

3.1 Play-Way Method:

This method consists of the activities that include a sort of fun or play and give joy to the students. Students don't realize that they are learning but in a way they are gaining knowledge through participating in different activities. This method helps to develop interest in mathematics, motivates students to learn more and reduces the abstract nature of the subject to some extent.

Example: Mathematical games and puzzles.

3.2 Laboratory Method:

Laboratory method is based on the principles of "learning by doing" and "learning by observation" and proceeding from concrete to abstract. Students do not just listen to the information given but do something practically also. Principles have to be discovered, generalized and established by the students in this method. Students learn through hands on experience. This method leads the student to discover mathematical facts. After discovering something by his own efforts, the student starts taking pride in his achievement, it gives him happiness, mental satisfaction and encourages him towards further achievement.

Example: Making and observing models, paper folding, paper cutting, construction work in geometry.

3.3 Problem-Solving Method:

This method aims at presenting the knowledge to be learnt in the form of a Problem. It begins with a problematic situation and consists of continuous meaningful well-integrated activity. Choose a problem that uses the knowledge that students already have i.e. you as a teacher should be able to give them the problem and engage them without spending time in going over the things that you think they should know. After students have struggled with the problem to get solution, have them share their solutions. This method will help them in developing divergent thinking.

Example: Put a problem of finding the amount of water in a given container instead of deriving the formula of volume (cylinder filled with water).

4. Teaching aids:
It can be anything ready-made or made by the teacher or made by students. Different teaching aids should be used in teaching mathematics like Charts, Manipulatives, Programmed Learning Material (PLM), computers and television.

4.1 Charts – It can be used to display formulae, symbols, mathematical and geometrical figures. Charts can be used for making students familiar to the symbols and for memorization of basic formulae. Even it can be used to bring to the students two- dimension geometry and the graphical representation in a better way.

4.2 Manipulatives – They are objects or materials that involve mathematics concepts, appealing to several senses, that can be touched and moved around by the students (not demonstrations of materials by the teacher). Each student needs material to manipulate independently. With students actively involved in manipulating materials, interest in mathematics will be aroused. Canny (1984) has shown that mathematics instruction and students' mathematics understanding will be more effective if manipulative materials are Used. Models can be used to make things concrete like three dimension figures in geometry.

4.3 Programmed Learning Material (PLM) – It is a self-learning material in Which learner can proceed at his own pace, It has the characteristics of all sequential steps, learner's response, self-pacing, immediate feedback, reinforcement and self-evaluation. It is helpful in acquisition of concepts like fractions, number systems, etc. and can be used as a remedy for slow learners for a specific content.

4.4 Computers and Television – Computer can be used for multimedia presentation for the concepts that requires visualization and Imagination. Computer can also be used for providing Computer Assisted Instruction (CAI), it is similar to PLM i.e. it is a computerized PLM. Television can be used to show some good mathematics education show.

5. An illustrative example of a teaching aid

To find are of circle of " r " radius

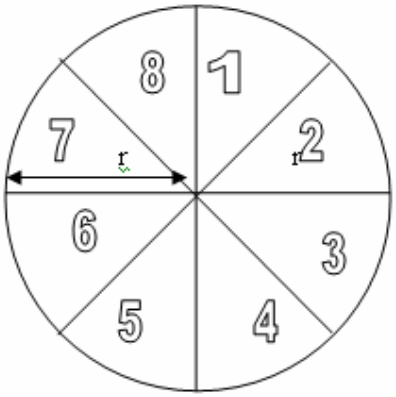

Fig 1 A circle whose area is to be found made 8 equal parts

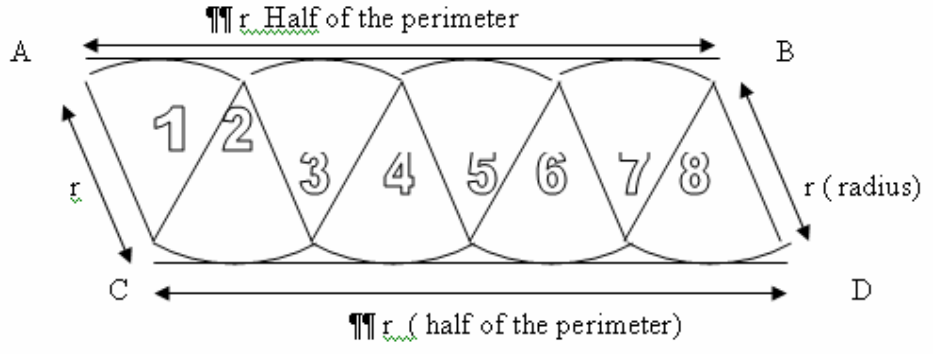

Fig 2 : 8 parts of circle are rearranged in form of a rectangle

5.1 Activity:

1. Take card board and draw circle of suitable radius
2. make it equal and identical parts as shown in figure (here 8 parts are made)
3. Mark different sectors as 1, 2 , 3, …. 8
4. cut the sectors in to individual pieces
5. Re arrange them in rectangle (as shown in figure)

note: As we do more number of sectors in this circle we get more accurate rectangle.

5.2 Observations :

1. Arrange the sectors in a ABCD closed figure , the ABCD looks like rectangles (if more number of sectors were made)
2. The height of this rectangle is as radius " r"
3. The breadth of this rectangle as ¶¶ r (half of the perimeter)

5.3 Calculations:

1. The are of rectangle is = breadth X height
2. A = ¶¶ r x r
3. A = ¶¶ r^2

5.4 Summary :

The rectangle was made out of a circle, hence both areas are equal, so area of circle is A = ¶¶ r^2

6. Conclusion :

The good teacher uses teaching aids to demonstrate the concepts and teaches the mathematics. The teaching aids make the teacher's easy and simple. More the teaching aids used in a class room, better the way of understanding. It is easy to make teaching aids , only we need to spend the time and use of knowledge

7. References :

1. Rachna Patel, "INNOVATIONS IN TEACHING OF MATHEMATICS "*www.waymadedu.org/StudentSupport/Rachnamadam.pdf*

2. Tak-wah Wong and Yiu-chi Lai "Exploring Factors Affecting Mathematics Teaching Effectiveness among Pre-Service Primary Mathematics Student- Teachers "WON06754, www.aare.edu.au/06pap/won06754.*pdf*

3. Patrick W. Thompson , **Concrete Materials and Teaching for Mathematical Understanding† "***pat-thompson.net/PDFversions/1994Concrete.pdf*