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PSS 6: Teaching of mathematics

Areas of Concern in School Mathematics

How far does our curriculum reflect the vision and objectives stated earlier? Whether the contents and materials given in the syllabus are appropriate to transact the vision into reality? These are some of the core issues to be examined carefully and addressed accordingly.

One of the major areas of concern is that our curriculum is incapable in making Mathematics learning an enjoyable process. What we see is that most of our children consider it as a difficult, boring and fearful subject.

On the one hand, **it develops a feeling of failure among a large majority of students,** and on the other hand, **it creates disappointment among a minority of gifted or talented students.** If we are not able to provide opportunity for these talented children to enjoy learning Mathematics, and to utilise their creative abilities effectively, slowly they would also start hating the subject.

Continuous and periodic assessment of students' learning is required to determine the extent to which the pre-determined objectives have been achieved. We may think that it is a very simple activity. But, an effective assessment requires ingenuity and innovativeness. **The theoretical knowledge provided to the teachers alone will not help them to implement effective assessment strategies in the classroom.** The teachers should be provided with various examples of assessment strategies with demonstration. Hence, in the curriculum there should be a scope for discussing about different assessment activities.

While discussing various areas of concern in Mathematics, we cannot ignore teacher, the very important concern. The pedagogy followed by the teacher is positively related to the success of students. Curricular Choices at Different Stages of School Mathematics

What are the different content areas or themes to be included at various levels of school education? Do we include all topics at all levels? These are some of the issues to be addressed while constructing the curriculum. The choice of the topics should be in tune with the vision and accompanying objectives. While selecting a particular topic or theme, its suitability to the students of that level should also be taken care of.

Curricular Choices at Primary Stage of School Mathematics

Primary school stage is the basic platform on which the later stages need to be built. Two things have to be considered here while choosing the content. Firstly, this is the stage at which we need to create among children a positive attitude towards the subject of Mathematics. Naturally, young children like to play games and indulge in activities. Hence, ample scope must be given to include more Mathematical games, puzzles and other

recreational activities at this stage. Secondly, since this is the level at which basic concepts of various mathematical ideas are to be developed. Higher mathematical concepts can be developed only if, children have a strong base. Hence more efforts need to be made for creating strong base for Mathematics through effectively organising various activities. Most of these concepts have direct implications for day to day life of the child. Hence, as far as possible these contents should be taught by connecting them with everyday life situations. Various topics to be included at this stage may be number and its operations, shapes, spatial understanding, patterns, measurement and data handling. The curriculum must explicitly incorporate the progression that learners make from the concrete to abstract, while acquiring concepts. Apart from computational skills, stress must be laid on identifying, expressing and explaining patterns, on estimation and approximation in solving problems, on making connections, and on the development of skills of language in communicating and learning.

Curricular Choices at Upper Primary Stage of School Mathematics

During Upper primary stage, slowly children must be given opportunity to deal with abstract concepts. In order to sustain their interest and make them learn mathematics without fear and boredom, care must be taken to provide various mathematical games, puzzles, shortcuts, and recreational activities. This is the stage at which algebra needs to be introduced. It should be introduced by connecting it to real life situations and through its use in solving various life problems. This is the stage at which the concepts like percentage, ratio, proportions, interest, etc. are to be introduced. Mere introduction of these topics without connecting them with real life situation is of no use. The systematic study of space and shape and for consolidating their knowledge of measurement, data handling, representations, and interpretation form a significant part of the curriculum at this stage.

Curricular Choices at Secondary Stage of School Mathematics

At the secondary stage, students begin to perceive the structure of Mathematics, as a discipline. Pure rote-learning until facts are memorised mechanically, is to be avoided and opportunities to be provided to relate conceptual knowledge accompanied with procedural knowledge. Examples and activities to be provided for familiarising various concepts through the characteristics of mathematical communication, carefully defined terms and concepts, the use of symbols to represent them, and precisely stated propositions and proofs justifying propositions. Students develop their familiarity with algebra, Mathematical modelling, data analysis and interpretation during this stage. Algebra and arithmetic can be correlated with geometry. Algebra and geometry can be correlated with trigonometry. Attention must be paid also to the relationship of Mathematics with other subjects such as physics, chemistry, biology, geography or social sciences.

Curricular Choices at Higher Secondary Stage of School Mathematics

Mathematics curriculum at the higher secondary stage should make the students realise a wide variety of mathematical applications and equip them with basic tools that enable these applications. The correlation with other subjects like physics, chemistry, biology, economics, commerce, astronomy, computer science, etc needs to be emphasised at

this stage. This stage is the launching pad from which the student is guided towards career choices. By this time, the students' interests and aptitudes have been largely determined and Mathematics education in these two years can help in sharpening their abilities. Greater attention is to be given for preparing children to the subsequent study of Mathematics at higher levels.