

Trends in the Mathematics Curriculum

by Marlow Ediger
Professor of Education
Northeast Missouri State University
Kirksville, Missouri

Teachers and supervisors need to study, appraise, and ultimately implement selected relevant trends to improve teaching-learning situations in the curriculum area of mathematics. Sources for gathering data on these major trends include the following:

1. College- and university-level textbooks in teacher training programs of mathematics education.
2. Reputable textbooks for students (including teacher's manuals) utilized in the school/class setting.
3. Knowledgeable resource persons in the area of mathematics teaching.
4. Recent professional periodical articles, pamphlets, and brochures directly related to improving the mathematics curriculum.
5. Observations made regarding significant innovative methods of teaching mathematics in the public school setting.
6. Use of diverse audio-visual materials to obtain new content.

Relevant Trends

The following relevant trends could be considered important in developing appropriate objectives, learning experiences, and evaluation procedures in ongoing units of study, and therefore in developing a more meaningful and interesting mathematics curriculum.

1. Students should have ample opportunities to acquire knowledge inductively. To emphasize inductive procedures in teaching and learning

situations, the teacher should be proficient in asking sequential questions. Students may then be guided to develop relevant concepts and generalizations through the use of discovery methods. Deductive means of teaching, such as meaningful explanations, need not be slighted. Within the framework of inductive instruction, the teacher will need to clarify content discussed in the school/class setting, which involves deductive approaches in assisting students to achieve major understanding and skills objectives.

2. Students must be provided with a variety of learning activities to assist them in achieving optimal development in the mathematics curriculum. Too frequently, no doubt, reputable series of textbooks provide the major resource for students learning mathematics. In addition to recommended series of textbooks, the teacher should also utilize markers, filmstrips, films, slides, transparencies, pictures, and simulated materials to provide for individual differences.
3. Students should have ample opportunities to attach meaning to structural ideas in ongoing units of study. The commutative and associative properties of addition and multiplication, the distributive property of multiplication over addition, the identity elements of addition and multiplication, and the property of closure should be stressed adequately in the mathematics curriculum. Structural

ideas, for students to attach meaning to, need to be significant and must be understood. A variety of learning activities could make these major generalizations more meaningful to individual learners.

4. Balance between and among understanding, skills, and attitudinal objectives need to be stressed in teaching-learning situations. Too often only achievement of understanding content or subject matter is emphasized. These are significant ends to attain. However, students should be given opportunities to practice or utilize content or subject matter. What has been learned previously in terms of facts, concepts, and generalizations may be applied in problem-solving situations, thus emphasizing skills objectives in the mathematics curriculum. A further result of achieving understanding and skills objectives should be desirable student attitudes. Interesting, challenging, and purposeful learning experience for successful achievers can do much to guide their development in the attitudinal or affective dimension. Having an adequate self-concept as well as a desire to learn will aid students in achieving these objectives.
5. The use of diverse techniques is required in appraising achievement. Not all techniques evaluate or measure the same facet of achievement, nor is any one technique of evaluation a perfect approach. Thus, a variety of evaluation methods must be utilized in appraisal. The following approaches may then be used to evaluate progress in mathematics achievement: teacher-written test items, rating scales, checklists, teacher observation, sociometric devices, student self-appraisal, anecdotal records, assessing of students' products and problem-solving abilities. Intellectual, social, emotional and physical

growth must be evaluated to ensure sequential progress.

6. Students should be given opportunities to engage in solving realistic problems in the mathematics curriculum. Within a stimulating environment, they need to identify problems, select content related to solving the problem area, develop a possible answer or answers and evaluate the quality of the solution. Critical thinking is required to choose delimited problems and analyze related content in order to arrive at solutions. Creative thinking may well be inherent in problem-solving situations, for example, learners developing unique, novel solutions to problems. Situations in society demand that individuals become proficient in problem-solving, critical thinking, and creative thinking. Therefore, objectives in the mathematics curriculum must stress student proficiency in these skills.

In Summary ...

Teachers and supervisors need to study significant trends in the mathematics curriculum by using a variety of reference sources. Ultimately, they may implement revised, agreed-upon objectives, learning opportunities, and appraisal techniques in the school curriculum.

Selected References

- Ediger, Marlow. *Relevancy in the Elementary Curriculum*. Kirksville, Missouri: Simpson Publishing Company, 1975.
- Grossnickle, Foster E., and John Reckzeh. *Discovering Meanings in Elementary School Mathematics*, sixth edition. New York: Holt, Rinehart and Winston, 1973.
- Swenson, Esther J. *Teaching Mathematics to Children*, second edition. New York: The Macmillan Company, 1973.