

## The Arithmetic Curriculum : Essentials or Choices ?

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A relevant debate in the school curriculum pertains to the amount of structure the arithmetic curriculum should possess. One can conceive of arithmetic learnings for pupils being determined largely by the classroom teacher. Toward the other end of the continuum, a flexible, open ended arithmetic curriculum for pupils may also be possible.

The balance of this paper pertains to a discussion of who should be involved in selecting objectives, activities to achieve these ends, and appraisal procedures.

### **Essential Learnings in Arithmetic**

There are educators as well as lay people who believe that common learnings exist for all pupils to achieve in arithmetic. These basics prepare pupils to deal effectively with situations involving addition, subtraction, multiplication, and division, presently as well as in the adult world. One cannot be a successful individual without mastering these essentials. Essential learnings in arithmetic have stood the test of time and will remain vital in the years to come. Thus, common learnings in arithmetic for pupils to achieve are not subject to change but are relatively stable. Selected situations in life may change rather continuously, such as increased automation and inventions, attitudes, values, and beliefs. However, essential learnings in arithmetic have not reflected these changes.

Modern mathematics programs of the 1960's may have incorporated specific advantages over previous objectives in the arithmetic curriculum. However, when all is said and done, essential learnings of the past are still relevant today. Thus, there are basic goals for each to attain in addition, subtraction, multiplication, and division. Learning activities need to be selected to attain these desired ends. Reputable basal textbooks can provide major learning activities for pupils in the arithmetic curriculum. Ultimately, quality programs of evaluation need to be in evidence to determine pupil progress. Ample emphasis needs to be placed upon testing procedure to ascertain pupil achievement.

### **Learning Centers and the Mathematics Curriculum**

Somewhat opposite of an essentialist arithmetic curriculum, learning centers in the school/class setting may be utilized. Each center has selected activities for pupils to participate in. There are more activities at all the centers combined than any one pupil can possibly complete. This situation is necessary so that a learner may sequentially choose tasks to complete. If a pupil could complete all tasks at all of the centers, he/she can then not select, from among alternatives, as to what to learn and the order of these learnings. The tasks at each center need to be varied in terms of

complexity so that adequate provision is made for individual differences in the school/class setting.

The teacher may develop materials and tasks to be in evidence at each learning center. To have a more open ended curriculum, pupils can be encouraged to bring items and objects, reading materials, records, tapes, pictures, and other audiovisual materials for the diverse learning centers. (Pupils with teacher guidance need to develop relevant standards of conduct to utilize materials safely and efficiently.)

An open ended curriculum is in evidence if pupils can truly make decisions in choosing what to learn and in what order. Advocates of learning centers methods of teaching and learning believe that a more adequate self-concept is being developed by learners if personal choices can be made in the curriculum. Sequential success in learning may also be inherent if a pupil may choose that which harmonizes with present levels of achievement, and yet challenging tasks are being selected. If a pupil can perceive purpose in learning, this should assist learners individually to attach meaning to ongoing activities and experiences. The interests of pupils are also being encouraged when a learner sequentially chooses tasks to complete. Generally, a task is not selected unless there is inherent interest to participate.

Pupils could select, among others, from the following types of tasks:

1. rather heavy use of reputable basal textbooks to develop sequential learnings.
2. utilization of programmed materials to achieve sequence in small steps of learning.
3. resource units from which objectives, activities, and appraisal procedures may be selected.
4. completion of sequentially stated measurable objectives.
5. use of mathematics laboratory procedures of teaching and learning.
6. the pupil identifying life-like problems in mathematics and developing related solutions.

Humanism, as a psychology of learning, advocates that pupils engage in the making of choices and decisions in the curriculum. A common learnings mathematics curriculum emphasizing essential learnings for all pupils violates options that pupils should have in the selection of ends and means within the framework of teaching and learning.

### **Pupil-Teacher Planning and the Mathematics Curriculum**

A very open ended mathematics curriculum can be in evidence with the utilization of learning centers to aid optimal pupil achievement. Thus, pupils with teacher guidance may plan which materials and tasks to have at selected centers. Much pupil input into the mathematics curriculum may also come from the use of contracts. The contract is an agreement between the pupil and the teacher for the former to complete a given set of tasks within a flexible, reasonable period of time. The contract may be signed by both the involved pupil and teacher including the due date of the project. The learner can even take the initiative to determine which tasks to complete. The mathematics teacher is a stimulator of pupils to achieve well in the school curriculum and thus assists the involved learner in deciding upon quality tasks to complete in the contract. Thus, the pupil and the teacher may take equal initiative in planning the contents of a contract. The teacher could even decide that which is appropriate for each pupil to achieve in a contract. However, the teacher is then omitting the concept "pupil-teacher planning" in ongoing activities and experiences.

Guidelines to emphasize in developing contracts in the mathematics curriculum may well include the following:

1. Pupils should experience sequential success in learning.
2. Pupils should attach meaning to that which is being attained.
3. Pupils need to perceive purpose or reasons for participating in ongoing experiences.
4. Individual differences among pupils need to be provided for in an adequate manner.

These guidelines can be followed regardless of the method of teaching pursued in the mathematics curriculum.

### **In Conclusion**

Educators need to study diverse materials of teaching, as well as different philosophies of education, and ultimately implement objectives, learning activities, and evaluation procedures which truly assist each pupil to achieve optimally.