

Instructional Problems and Teaching Strategies

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The following is an edited version of the authors' paper.

The teaching of mathematics courses includes many problems. It is our intent to identify and analyze some of these problems as well as to propose some suggestions to stimulate interest in mathematics.

In any classroom the variety of students can be a problem. A group of students implies an assortment of backgrounds. The assortment of backgrounds can mean nationalities and/or the educational backgrounds of the students enrolled in the course. A variety of nationalities can be a problem to the teacher and all the students in the class if some of the students are not fluent in the language of instruction. The educational background of pupils can be a problem if it does not include the basic knowledge that is required for the course. A student may have the necessary prerequisite courses but may not have learned the material he was expected to know. At the other extreme is the student who has previously learned the material being covered. In this case, it is very difficult for the teacher to maintain the interest of this person.

Then, too, there are the different learning abilities of a group of students which poses a problem in determining the pace at which to teach the course. The teacher must cover the material quickly enough to maintain the interest of the fast learners and yet teach slowly enough for the slower learners to grasp the concepts being covered.

The interest level of the pupils is a problem area. Students who are required to take the course will not have as much enthusiasm about the material as those students who have chosen to take it. Without student cooperation, it is almost impossible to teach the knowledge required by the course objectives. The diversity of programs a student is taking is a problem too. Although the teacher has some leeway in the selection of topics to be covered, his selection must be based somewhat on the programs his students are in. For example, the students in geometry courses for the faculty of education do not need to know the depth of the material that mathematics majors require.

Different nationalities and programs can cause another problem in the classroom. Students may not have a great deal in common and therefore there is not much comradeship among them. This deprives the students of the opportunity to learn from each other outside the classroom, which can be as good a learning experience as time spent in class. It is unfortunate when students are not friends with one another and with the instructor, because there is a much better atmosphere for learning when they are.

Another problem that arises in teaching mathematics is determining whether or not the students understand the concepts being presented. For a successful course, the instructor has to ensure the complete comprehension by the student of the topics being covered. It is imperative that the instructor makes clear the meaning and applications of the subject matter. As well, the instructor should try to relate the concepts being taught to real life situations when possible. By doing this, the student is able to visualize abstract ideas and is therefore more likely to retain the knowledge gained.

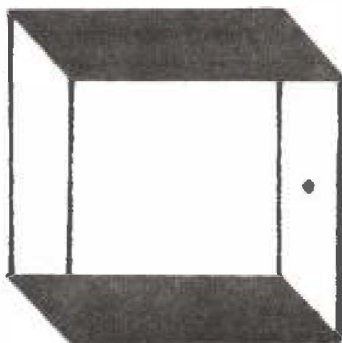
It is helpful for the students to have a few exercises to be done after each day's lecture, rather than after each section which may take two or more classes. If he finds that he has difficulties, he is able to get help right away rather than let the problems get larger and more complex, class after class. As well, by practicing the newly gained knowledge, the student will more likely retain the concepts he has learned.

To account for the different learning abilities in a class of students, the instructor could offer to help the slower learners in an extra class, or individually. If this were done, the slow learners would be able to learn at their own speed without slowing the rest of the class. If the instructor is unable to provide this extra help for the slow learners, he will be confusing some students while boring others.

If there is a lack of comradeship in a class of students, the teacher might initiate a class project where all of the class members are involved as one group (possible in a small class). Usually this proves to be beneficial to all students as well as the instructor.

Each instructor must realize that different instructional approaches work best for different topics. By varying the instructional approach, the students may learn more easily. Another possibility is that it may generate greater interest among the students which, in turn, creates enthusiasm.

A final suggestion to teachers is to share their experiences. By doing so, they can learn teaching techniques from each other.



Is the dot on the inside or
the outside of the box?

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