

**Dealing with Pedagogy and
Mathematical Content
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In this paper, I draw on a research in describing and discussing the pedagogy, mathematical content and the reality of teacher's instructional situation- as a case study in 2006.

**Dilemma of Pedagogy &
Mathematics Content**

Teachers and learners are individuals with their own

- backgrounds
- personalities and ambitions
- Methods, which work well for one teacher sometimes, fail for another
- The preferred style of learning for one learner may be different from that of another.
- An approach, which works well with most of a class, may fail totally for a significant minority
- Thus good teachers cater for the needs of individuals as well as groups by continuously modifying their approaches in response to the feedback they receive

Moreover, the fact that teachers in many developing countries are in dire need,

- better content knowledge is often not mentioned.
- It is worth noting that advocacy is nothing more than a mildly radical interpretation of a prevailing national trend.
- Inferring from the above, two developments may emerge- one is the emphasis given to teachers' acquisition of
 - **pedagogical knowledge, and second is acquisition of**
 - **content knowledge**

**Motivating students to engage in
mathematical learning activities**

Extrinsically motivating students to engage in learning activities is superior to not motivating students at all. Thus students can be motivated to do mathematics once they discover the connection between the mathematics and their own needs and interests.

Issues to consider

Because giving directions is frequent, teachers can minimize streamline communication procedures, model problems attitude and reduce the amount of teacher-talk in classrooms by establishing cues that instantaneously communicate certain recurring expectations to students.

Educational Implications for Teachers

It is imperative to draw attention of those who teach mathematics in schools to what I believe to be the implications of the reason for teaching mathematics, which I have discussed: Mathematics teacher has the task:

1. of enabling each learners to develop, within his/her capabilities, the mathematical skills and understanding required for adult life, for employment and, while remaining aware of the difficulties which some will experience in trying to gain such an appropriate
2. of providing each learner with such mathematics as may be needed for their study of other subjects
3. of helping each learner to develop so far as is possible their appreciation and enjoyment of mathematics itself and their realisation of the role which it has played and which continues to play both in the development of science and technology and of our civilisation;
4. Above all, of making learners aware that mathematics provides them with a powerful means of communication.

Methodology

- ❖ The methodology involved in this study was exploratory for which a qualitative approach was used as a case study.
- ❖ The respondents (fifteen learners, five tutors and guardians respectively) were selected according to a purposive non- probability sample method;
- ❖ semi-structured interview with a schedule with each of the respondents (guardians) was used.
- ❖ An inductive form of reasoning was used and concepts, insights and understanding developed from patterns in the data.
- ❖ Responses that were quantified were transformed into tables where percentages were computed to determine the degree of emphasis.

Interpretation of Findings

There is an alarming trend, which may be called the mathematics-avoidance syndrome. With few exceptions, be it in curriculum, or assessment, tend to skirt the importance of pedagogy and content as one parent (Mr. T- pseudonym). This syndrome is borne out by many of the major developments in mathematics education of the past decade, which is not driven from sound pedagogical and content knowledge contended by Arzt, and Armour-Thomas (2002). Hence some advocates decide that the way to improve mathematics education is to change pedagogical techniques and make small group learning centrepiece of mathematics instruction in every classroom supported by Cangelosi (1999).

Conclusion

In this fast paced technological (knowledge) age, we have all become learners of mathematics. It is mathematical knowledge that has fuelled the fires of advances and it is those very advances that generate new and more complex mathematics such as the mentioned Hilbert's 23 Problems together with The Millennium Prize Problems. The task then of mathematics education becomes one of helping students and those who work with them to understand how to learn mathematics, how to problem solve, and how to acquire the 'automaticity' with skills and procedures necessary for problem solving. Mathematics is best learned in meaningful and memorable contexts. Conceptual and procedural knowledge is best developed when a need for it has been established. Teachers of mathematics need to know the mathematics content itself, good methodologies, and the pedagogy of mathematics itself.

Appendix: Discussion and Results

Nevertheless the fact that 18.2% used the activity method and 63.6% used problem-solving methods in teaching mathematics meant that all was not lost. As noted above, since teachers are expected to use integrated approaches to teaching mathematics, a unified method of mathematics, which would consider all the teaching methods, would be more appropriate.

Adding up the values of the analysis of 'very often' and 'often' and then arranging them in a hierarchical order, the method from the most frequently used to the least frequently used, demonstration and discussion methods appeared to be the most popularly used methods (i.e. 100.0% In each case). The other methods used included; activity method (81.9%), lecture method (81.8%), discovery method (85.5%) and problem solving method (63.7%).

Teachers notion about certain aspects of teaching mathematics were also explored. All teachers (100%) regarded students' ability to observe, develop skills as important, also all teachers attached importance to students' ability to participate in mathematics lessons. In addition 81.8% of teachers attached some importance of grouping students for activity. Finally 90.9% teachers considered students' communicating among themselves as important. Although most teachers still relied on traditional methods of teaching such as lecture method and demonstration method often, their notions that students must participate actively in the lessons should give an encouraging signal.

Learning is a highly complex process and has characteristics, which are both social and individual in nature. Mathematical knowledge may often seem to have a highly personal nature as if we had created it for ourselves. However, mathematics is usually taught to a large group of learners who are asked to arrive to a common understanding of an accepted body of knowledge.