May 2011

One step on a new journey

Salima Shahzad Arwani
Aga Khan University, Institute for Educational Development, Karachi

Follow this and additional works at: http://ecommons.aku.edu/pakistan_ied_pdck

Recommended Citation
Available at: http://ecommons.aku.edu/pakistan_ied_pdck/16
ONE STEP ON A NEW JOURNEY

Salima Shahzad Arwani relates both experiences and insights.

Introduction

During Mathematics Teaching Course – I (MT-I), I was given the opportunity to teach a primary mathematics class at a Government school in Karachi, Pakistan while on teaching practice. I was lucky to be able to share the lesson planning with a friend, and we found the sharing of ideas a supportive process. The focus of the lesson plan was to be working on a problem solving task. Here I hope to share the insights I gained through teaching the lesson, together with some of the issues and challenges that emerged, and their implication for me as a teacher.

Previous experience and beginning the new journey

Before joining this course, I would describe my teaching strategy in the mathematics classroom as one which did not provide space for students, or enable them to take an active role in classroom activities. For example, I always considered myself as the only source of knowledge, rather than a resource bringing knowledge to the classroom. I used to solve problem-solving tasks for the students, on the board without requiring anything from students. Consequently, students played a passive part in the classroom, their role was simply to copy, and to absorb — or not — the ‘knowledge’ presented by me the teacher. However, after going through the learning experience provided by this course, I realized that mathematical knowledge can be constructed when students are actively engaged, and it can allow them the autonomy to think both creatively and mathematically. I realize now that problem solving strategies can be used in all areas of mathematics to promote students thinking, rather than the ‘solving the questions on the board’ approach. According to Ollerton (2007), problem solving in mathematics promotes understanding of the concepts as well as presenting the opportunity for students to make their own decisions.

During the MT-I course I found the national curriculum does not limit the scope for problem-solving strategies to be used. I also wanted to explore problem solving approaches in my teaching practice to see if my students can be persuaded to be less inactive during mathematics lessons.

Strength of the lesson

I had not previously read research articles and books before I worked on a lesson plan and this did limit my practice.

First, by reading relevant material on problem solving tasks, I was able to enhance my personal mathematical knowledge. I felt able to design a problem solving task which was ‘beyond the text book’ and related to the daily lives of the students. Fobisher (1994), emphasises that the problem should be of relevance to pupils’ everyday life. I found that students were excited when solving the task because they were able to relate to the problem and make it ‘their own’. I realized that the teacher must present a task which students can engage in and gain enjoyment from solving.

Secondly, while planning the lesson, we allocated proper time for students to think, and to find a solution. Because we did not over-plan for the students, we tried to provide ample time to think. As Polya (1991) describes, problem solving tasks demand time, devotion and sound practice. As time was limited I did not insist that students complete the task, and that they continued working in a second lesson. I was thinking that mathematics lessons should be longer than those in other subjects as in mathematics students are actively involved in the thinking process.

Thirdly, while reading books and articles I found that assessment is a necessary part of problem solving tasks. Robinson (2004) suggests that for problem solving situations, presentation, formal written tests, or even a formal ‘write up’ can be used as part of the assessment. While Charles, Lester & O’Daffer (1992) emphasise observation, and questioning techniques as powerful assessment tools in the classroom.
**Issues and challenges**

One of the issues I faced concerned Polya’s *four steps of problem solving*. Polya (1991) reports that problem tasks can be solved by following a four step process.

- Understand the problem
- Devise a plan
- Carry out the plan
- Look back [review]

While on teaching practice I emphasised that I expected students to solve the tasks by following Polya’s ‘four steps’. However, students were not able to solve the problem. I observed that they felt that they had to devise a plan, and as a result were not able to think beyond that plan. I thought that I needed to create opportunities for students to think freely and creatively. Frobisher (1994), suggests that Polya’s four steps are easy to remember, but difficult to implement – as students want to play around with the ideas, but they are unable to do this until they have constructed a plan. Therefore, the next day the ‘four steps’ approach was not mentioned, and students seemed able to solve the problem given this freedom.

The second issue I came across was that of language. Teaching in an English medium school for five years, I was using English as the language of instruction. However, I found the students unable to understand my instructions. Winsor (2007), describes that for many students learning mathematics is a difficult task, especially for those who need to overcome a language barrier. Therefore, I felt that I had to adopt a bilingual approach in the classroom. I also observed that at one level students were stuck, as they were not able to explain their reasons in English. So, I asked students to write in their native language – suddenly they all became engaged in solving the problem. I realize now that as a mathematics teacher, one of my roles and responsibilities is to facilitate students in problem solving situations. I must foster students’ thinking, as without this skill students will not be able express their solutions in any language. As most students think in their first language, as a teacher I think we should give them opportunity to express their thinking and strategies in their first language.

**Conclusion**

Thus, I found that students were able to solve the problem solving tasks when I allowed them the time to think freely. Though I learnt a great deal through the process of planning and teaching mathematics, I believe that this is just the starting point of my journey. In future I want to explore further problem solving tasks, and to enhance my subject content knowledge, together with the all important pedagogical skills.

Salima Shahzad Arwani is a student at the Aga Khan University Institute for Educational Development, Pakistan.

---

**References**


