

## MY PRACTICES AS A TEACHER EDUCATOR: A DISCUSSION OF PRE- AND IN-SERVICE TEACHER RESPONSES TO SESSIONS ON THE USE OF CULTURAL OBJECTS AS TEACHING AIDS.

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*This paper is based on action research that I conducted into my practice of training mathematics teachers in use of teaching aids in teaching in particular, the use of cultural objects. The aim was to discover if there was need to improve my practice and how to do so. Teachers at pre- and in-service levels were involved (two cohorts of student teachers and two practising teachers). Two action research cycles were completed with results showing opportunities for improvement in my practice. This paper offers a discussion of results from cycle one that show variations in the responses to the sessions and the classroom practices of the pre- and in- service teachers*

### INTRODUCTION

Mathematics plays an important role in society. For example it grades, labels, and classifies people and summarises and condemns whole cultures (Harris, 1997). It empowers people to participate in national issues in a critical way (D'Ambrasio, 1991). This highlights concerns about countries like Uganda, a developing country where many people fail to learn mathematics. The 2002 national examination results at secondary school ordinary level in which 51.1% candidates failed mathematics (Monitor March 27, 2002) is an example of the massive failures in mathematics in Uganda. Yet certificates in national examinations at primary and lower secondary school levels are graded based on whether students pass or fail mathematics and English.

One of the causes of this failure could be the way mathematics is taught as suggested by Ssajjabbi (1992) who described the teaching methods in Uganda as traditional and authoritarian. This is reflected in what I witness in schools annually when I go to supervise students on school practice. One hardly sees learners being involved fully in learning. Teachers rely on textbooks and use no other aids apart from the chalkboard.

This non-use of teaching aids which results in the lack of active involvement of learners in lessons and, therefore, their own learning is a concern, particularly when this is the case despite the training teachers get in the use of teaching aids. In 1999 I carried out a survey (Kaahwa, 1999) in which teachers' responses to a questionnaire gave me major reasons why teachers do not use teaching aids. Teachers said that schools and the ministry of education do not provide them with materials to use as teaching aids. My reaction to this was "but I train teachers to use local materials!"-

and local materials provide cheap teaching aids. This prompted me to question my practice and carry out an action research study.

My belief about learning is that individuals construct knowledge. They do not simply receive it. They do something with and about it while trying to make sense of it. Dean (1982), Orton (1992) and Noddings (1990) offer an interpretation of Piaget's theories about how children learn; that children learn actively through a series of experiences out of which they abstract knowledge. Dean (1982) and Orton (1992) also give an interpretation of Bruner that points to the need for children to be actively involved in learning and to do what mathematicians do like conjecturing, hypothesising, proving, generalising and extrapolating. Such ideas are important for my teaching. They are constructivist views (Noddings, 1990; Phillips, 2000) and imply that teaching should happen in a way that enables learning to take place. Teaching mathematics for example should involve a teacher in the creation of environments that support learning by construction.

When I train teachers my aim is to make them do things by going through activities that I hope help them develop the knowledge and skills that enable them to teach mathematics effectively. I aim at helping them learn how to actively involve learners in learning. For example, I ask them to develop simple activities for learners, activities that should guide learners to discover mathematical concepts. It is always my hope that after they produce a good activity of that type, they will go on to plan other types of activities that require learners to explore mathematics freely and that guide them to experiment and do problem-solving. It is my hope that I am providing teaching that enables such learning to take place.

### **AIMS OF THE STUDY**

The aim of this study was to enable me to look at my practice, to discover if there was need to improve and if so how to improve. Thus my questions were "what is my practice of training teachers in the use of teaching aids?" "How can I improve upon it?" The use of teaching aids is only a small part of the program that teachers go through in training. However, even in the area of teaching aids, I focussed on cultural objects. So I asked "how can I improve my practice of training teachers in the use of cultural objects to teach mathematics?"

### **RESEARCH STRATEGY**

I used action research as a strategy for looking at my practice. It fitted my research for it enabled me to answer the questions I was asking (McNiff, 2000). Through its use I was able to document my practice and to look at it critically. I carried out two cycles of action research, but the discussions of this paper are based mainly on the first cycle.

## THE STUDY

As a way of looking at my practice, I used two categories of secondary school teachers, in-service (practising) teachers and pre-service (student) teachers. There were two practising teachers and two cohorts of student teachers at undergraduate university level. I held two, two-hour sessions with the practising teachers separated by a period of two weeks. In addition, the teachers were free to consult with me any time during this period (it lasted just over one month). With student teachers, I held one, one-hour session and another of a quarter of an hour. The students were free to consult with me any time they felt the need to do so. This was part of undergraduate course that I usually conduct for student teachers every year.

The content of the sessions with both categories of teachers was 'cultural objects and their use in mathematics teaching'. In the sessions, I explained the term culture pointing out possible benefits of using cultural objects to both the teacher and the students. I involved teachers in activities of identifying mathematics that they could see in the cultural objects that I provided, and in developing activities that they could use to teach specific concepts.

With practising teachers I had a conversational group interview after the first session, while for student teachers, I interviewed five of them individually after each session. In the interviews I inquired of the teachers what they had made out of the sessions.

I observed the practising teachers teach two weeks after the sessions of training and taped the lessons on video. I observed one of them again a year later and recorded her lesson on video and interviewed her. After lesson observations I interviewed the teachers. Student teachers taught eight months after the training sessions some of which I observed. I taped two lessons out of the six that I observed on video. Afterwards I interviewed each student teacher concerning what went on in the lessons.

## DATA ANALYSIS

I viewed the tapes of my sessions and those of teachers' lessons repeatedly looking for actions in teachers' lessons that reflected my practice. In the teachers' lessons, I was on the look out for the way teaching aids were used if at all. Did the teacher simply demonstrate? Or were learners involved in some activity developed out of these materials? Were some of the teaching aids cultural objects? How was my practice reflected in the teachers' practices? What did teachers' actions tell me about my practice?

In the interviews I sought for students' explanations for their actions. For example if they did not use teaching aids, why not? If they did not use cultural objects why not? What were their views about the sessions and the course in general? What were the responses of their classmates, (in case of student teachers) or colleagues (in case of

practising teachers)? I compared the findings from the practicing teachers and student teachers.

## **FINDINGS**

### **Teachers' responses to the training sessions**

#### **Student teachers**

Students' responses to sessions were reflected in their actions during the sessions, their talk amongst themselves after the sessions, their responses to interview questions and the lessons they taught after sessions. On the whole their responses were of a mixed nature. While many of them responded positively during the sessions and did the assignments, they felt that the course demanded too much of their time and yet earned them few marks. Many thought that although the idea of using cultural objects in teaching was good to apply it would be a bother. Some of them were absent in some sessions.

#### **Practising teachers**

The two teachers showed interest in the sessions and associated activities. One of them in particular showed a lot of enthusiasm and commitment. This teacher did all I expected and even more. At one time she came to my home looking for me to discuss the activity she had developed from a cultural object. The second teacher, however, although interested showed less enthusiasm. He for example, did not bring an activity to the second session as I had requested him to.

## **CLASSROOM PRACTICES**

#### **Student teachers**

None of the students was observed teaching using cultural objects in their teaching. They appeared not to have integrated that idea into their practice. Those interviewed disclosed that they had failed to think of any cultural objects to use for the topics they were teaching. They also seemed unclear on the sources of cultural objects. The fact that students in their classrooms are from varying cultures seemed to be a contributing factor. Developing activities that could involve learners was still a problem for them. Those that used teaching aids mainly used them to demonstrate and did not involve learners in their use

#### **Practising teachers**

The lessons practicing teachers taught showed that although they could use cultural objects they still needed to work on their practices. The more committed teacher, however, demonstrated her ability to involve learners more. In the interviews the teachers revealed the many constraints they face in school thus hindering them from being more practical.

## **POSSIBLE EXPLANATIONS FOR THE VARIATIONS**

Teachers in both categories might not have understood what cultural objects are. With the student teachers this might be a result of the speed of my approach. The activities I used with them lasted only a few minutes. Two critical friends commented that the students appeared to have a sense of “false knowing”. That is, they might appear to have understood when in actual sense they have not. This could have been the case because when it came to actual classroom teaching they did not demonstrate it.

The time factor might in part explain the variations in the responses of the two categories of teachers. The student teachers had a total of about one and quarter hours of session. This might not have offered them ample time to benefit from the sessions. For example, they did not use easy sources of cultural objects such as asking the students to bring some. Also, they did not seem able to figure out what objects to use with certain concepts or skills.

Because the sessions with practising teachers lasted longer, they were more settled than those with student teachers. I was not in a rush and so teachers had ample time to do and discuss both among themselves and with me. This could not happen with the student teachers. In addition there were many of them. Even when they came back to bring their assignments, I never gave them enough attention.

Another possible explanation for the variations might be the seriousness and interest with which individual teachers viewed the sessions. Practising teachers appear to have been more committed to the sessions and the project in general. This keenness was demonstrated by one of these teachers when she showed up at my home, which she had never visited before, to discuss her activity before I could see her teach using it. A year later this same teacher willingly demonstrated a lesson to the student teachers in one of the sessions of cycle two of my research.

In literature there are other possible explanations like teachers coming to training with beliefs about teaching (Ball, 1988; Nicol, 1999) that are difficult to change.

## **IMPLICATIONS FOR MY PRACTICE AS A TEACHER TRAINER.**

Implications of the above to my practice of training teachers are that: (i) Time is a big constraint in my training of teachers. But constructing knowing needs mulling over, which does not have to be part of sessions. How can I persuade students to devote more mulling time to this aspect of course? (ii) I need to win individual teacher’s interest and commitment to being effective teachers. In order to construct such learning, the students need to see its importance. (iii) I need to be more practical in my sessions than I was in this cycle. I should do my best to do what I would desire to see teachers do and as Ball (1988) puts it, I need to practice what I preach.

If I believe that knowledge is actively constructed (Noddings, 1990; Dean, 1982; Orton, 1992) and that learners should be actively involved in learning, then I should translate this into practice. I should create environments that as much as possible

- make learners participate. I should create situations for learners to do more and talk more while I do less and talk less. I need to create a 'need to know' which may stir their interest.

The findings of this cycle, which was cycle 1, did inform the actions of the intervention in cycle two of my study. It is not possible to discuss cycle two in this paper. However there is a brief summary of these findings in the proceedings of PME26. My next course of action is to pursue my work with teachers further, exploring ways of balancing my constructivist beliefs with my tendencies to tell.

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