

PRACTICAL CONSTRAINTS UPON TEACHER DEVELOPMENT IN PAKISTANI SCHOOLS

Dr. Razia Fakir Mohammad

Abstract

In this paper I discuss the impact that both conceptual and contextual problems have in inhibiting teachers' disposition towards capacity for development. These problems were highlighted from teachers' participation with a teacher educator in a collaborative culture of learning and within their schools' culture. They were challenged, supported and committed to teaching for achievement of their new aims deriving from an in-service course at a university in Pakistan. The teachers' capacity to learn was increased during the period of research; however, they needed support in dealing with issues for further enhancement of their teaching. The analysis of the teachers' transition from their routine teaching to new teaching revealed the teachers' needs as well as a gap between theory and practices in teacher education. I conclude the paper by suggesting to the community of teacher educators (including myself as a member of this community), that we should revisit our perspectives of teacher development at the university in the light of practical reality in a school context.

Introduction

This study contributes to an understanding of, and hence to improvement of teacher education on which the education of children in Pakistani schools subsequently depends. The guiding principles behind this research were that reflection and justification of self-actions would enable participants to understand the reality and difficulties of practice and their own contribution to achieve improvement in practice in a collaborative partnership (Wagner, 1997; Jaworski, 2000). The research was premised on the idea of shared ownership in order to support and examine teacher implementation of new ways of teaching resulting from their learning in a teacher education course. The findings suggest that during the limited period of this research, the participants were able to go through only the initial stages of the learning process. Nevertheless, I as a researcher came to realise that the teachers had started to adapt teaching strategies, and discuss issues in their teaching such as their misunderstanding of students' responses and their own understanding of mathematical concepts. By working very closely with the teachers, I was also able to understand some of the issues of implementation of teachers' new learning resulting from their university study.

Context of the Research

Three teachers, Naeem, Neha and Sahib participated in the research. They had resumed their teaching after attending an 8-week in-service course for teachers of mathematics at a university in Pakistan. The new way of teaching mathematics discussed in this course was based on a social constructivist perspective of learning, on the idea that learners are active creators of their knowledge and not passive recipients that a teacher can fill with knowledge. A teacher's primary responsibility is to assist in the learners' cognitive restructuring and conceptual reorganisation through providing opportunities for social interaction in mathematical tasks that encourages the discussion and negotiation of ideas (see Cobb, et al., 1991; Jaworski, 1994). My study was designed to follow up some of the teachers after the course and to support the teachers in developing their teaching according to their new aims.

All three teachers aimed to increase students' participation in their own learning and develop students' conceptual understanding of mathematics (adapted from their

learning at the university). This became evident when they accepted my invitation to participate in my research and expressed the following individual aims:

- Sahib’s aim was to talk about the classroom issues and plan lessons according to new methods.
- Neha’s aim was to plan and teach lessons according to the ways that she had learned in the university course.
- Naeem’s aim was to discuss how to teach mathematics with reasoning.

Methodology

The nature of my research was reflective and participatory. I adopted interpretive research methods, collecting data by audio-recorded conversations in pre- and post-observation meetings; maintaining field notes during the teachers’ participation in teaching or in their learning with the teacher educator along with the teachers’ written comments (when provided) and my own reflective journal entries. The data were collected and analysed in the teachers’ native language of Urdu. In my analysis, I studied each teacher across lessons and identified a range of issues in the teachers’ learning. I checked that issues emerging across the three cases were indeed representative of the data as a whole. By listing all the examples that uncovered particular issues for each teacher, I was able to identify those that were common to the three teachers or distinct from each other.

Findings and Discussion

In this section I address issues germane to the thinking and practice of all three teachers that resulted from my cross-case analysis. However, due to the space limitation I discuss the examples from one teacher’s practice according to new aim of teaching.

Teachers’ Understanding of Students’ Answers

The first part of my analysis uncovered teachers’ difficulties both in addressing students’ thinking processes and in helping students get the right answers through their own mathematical reasoning. The teachers’ stated focus was to increase the students’ participation in their learning but their practice did not provide evidence of their attempting to view students’ solutions from the students’ perspectives. Nor did the teachers deal with what seemed like errors and confusion in students’ current understanding. The teachers did not seem to notice that students had developed different interpretations of what the teachers had been asking or presenting in the class. Nor did they clarify what was inappropriate in students’ explanations and why. I observed that the children were left alone with their confusions and were without any clear justification for the correctness or incorrectness of their answers.

Below, I present part of the conversation between the teacher (Sahib) and student, in which I observed only a routine way of dealing with the students’ answers.

- | | |
|------|--|
| 1 T: | Somebody has thought of a number, multiplied it by three, subtracted one and got five.
Tell me the number he has thought of.
<i>The teacher also wrote on the board,</i> |
| | $x * 3 - 1 = 5$ |
| 2 S: | Two |
| 3 T: | How did you find it? |

The teacher called that student to the board and asked him to write his method.

The student wrote on the board:

$2*3=6-1=5$ [the student multiplied 2 by 3 first, getting 6, and then subtracted 1 to get 5]
[The way it appears in writing is mathematically wrong (since $2 * 3$ is not equal to $6-1$); however, the student seemed clear in thinking while writing. He first multiplied and wrote the answer and then subtracted 1 from the product and got the result].

4 T: How did you get 2?

5 T: Good. [The teacher used this word often, I assumed that this was his expression to encourage students' participation] How did you find this?

The student was silent. The teacher then asked other students to explain in words what their friend wrote on the board. There was no response. The teacher then told the student.

6 T: First, you added one to five and you got six on the other side. Then you divided six by three to get two.

In the above example, the teacher explained the student's symbolic representation in a very different way to that used by the student (see line 6 in the data). The teacher's imposition of his own procedure and his rephrasing of the students' answers (after inviting the students to bring their own ideas) first encouraged and then discouraged participation. This led to confusion and sustained dependency on the teacher. This was evident in students' subsequent silence in the classroom in response to the way the teacher dealt with their explanations. The teacher's interpretation affected the student's level of confidence, because after that example none of the students offered their thinking process, either verbally or in writing. For example, Sahib then gave another equation, $x * 4 - 3 = 5$, and asked for the answer. One of the students said it was 2, but none of them then expressed a method to get the answer (either symbolically on the board, or verbally). In my analysis, the first student had his own way of thinking but the teacher ignored the student's way of thinking and did not confirm the student's method (see lines 2 to 4).

During our discussion, I asked the teacher about his different way of expressing what the student had written. The teacher reasoned that he wanted to teach a proper method. He also talked about the students' poor background of mathematics as a barrier in increasing their participation. In the teacher's opinion, it was very time-consuming to involve students and expect them to explain their thinking. He said that if he had taught the same lesson traditionally, he would have finished the entire exercise in the textbook.

Teachers' Mathematical Content Knowledge

The teachers' aim to teach mathematics with reasoning challenged their own understanding of mathematics. The problem of the teachers' limited conceptual understanding, their reliance on prescribed methods and particular answers, became evident when they came to express their mathematical point of view while planning, teaching and analysing lessons from beyond the textbook. All three teachers were, at times, unable to review, clarify and rationalize the mathematical assumptions behind the textbook exercises. The following example of Sahib's teaching 'division in algebra' illustrates the gap of teacher content knowledge.

Sahib began the lesson by testing the students' knowledge of basic algebra; for example, definitions of *variable*, *constant* etc and then he drew the following table and explained the rule of 'powers of two'.

2^4	$2 \times 2 \times 2 \times 2$	16
2^3	$2 \times 2 \times 2$	8
2^2	2×2	4
2^1	2×1	2
2^0		1
2^{-1}		$\frac{1}{2}$
2^{-2}		$\frac{1}{4}$

After that explanation, the teacher wrote the question $\frac{xy}{x}$. He solved the question in this way: $x^{-1}y = y$. However, he did not provide any linkages between his explanation of the rule involving powers of two and his solution to the question. Then he gave another question and invited the students to solve this on the blackboard. The whole class sat listening to the teacher; none of them raised their hands. The teacher's intention seemed to be helped the students to generalise the rule of exponents from that example of 'powers of two', and to apply the rule in the presented task. However, he did not provide adequate explanations to support the students' ability to understand such questions. I observed silence in the class. The teacher himself did not seem to understand the barrier of his own limited knowledge impeding achievement of his aims of helping the students to understand the questions.

Imposed Identity

The shift in the teachers' goals following their learning at the university demanded that they use their intellectual capabilities in planning, teaching and evaluating their lessons, contrary to routine practice. However, the teachers appeared to be highly routine-bound. The new aim in their teaching was to enable the students to be independent through allowing them to solve problems in their own ways. In practice, however, the teachers dominated the discussion, thus limiting the students' participation. For example, in the lessons (discussed above) Sahib discouraged student participation in spite of his expectation that he would increase their participation. Although, the teacher's intention (of child-centred learning) was mentioned as an objective in his oral planning, in his practice he did not move from very traditional interaction. In fact, all three teachers interrupted and directed the students' thinking through their continuous comments and questions. It was difficult for them to reduce their own domination of the lessons, to stop telling the students what to do or to provide the students with the space to organize their thinking. The teachers' behaviour did not allow the students to step back from dependent modes of behaviour, despite the teachers' aims and explicit intentions to do so.

Their habit of working in a teacher-dominated culture seemed to create mental barriers to self-analysis for all three teachers. The teachers' analyses of a lesson focused mainly on what the student said, what the teacher wanted and what the wider social problems

were in relation to the achievements or failures of their new aims of teaching. They appeared unable to critique their own mathematics and mathematics teaching. For example, Sahib talked about students' dependency and lack of interest but he did not to realise that it was possibly his own authoritarian stance that maintained the students' dependency. My view is that the teachers were unaware of the complexity of practice in relation to their new aims. These teachers claimed to be willing to change their practice but were unable to cope with the challenges. Perhaps the teachers lacked understanding of the concept of improvement itself or did not realise the difficulty of introducing changes in their classroom without perceiving and challenging the complexity of their habitual constraints.

Time Consuming Approach

The teachers faced difficulties in achieving their new aims of teaching within available school and lesson time. Their new practice demanded quality time to comprehend and rationalize new aims and new practices; however, that time was out of the teachers' reach. The time these teachers contributed to the research partnership was their non-teaching time at school in which they had to fulfil regular requirements such as marking. They had replaced this routine work with discussion in relation to achieving new aims of teaching. However, the cost of such replacement was their own time at home. Despite their devotion, the time was still not sufficient for the teachers to satisfy the expectations of their new role. This resulted in additional pressure on the teacher to continue the lesson on the following day. For example, Sahib commented on his effort to increase students' participation:

I cannot teach according to the new way; if I give them thinking time I would not be able to concentrate on written work. Tomorrow I have to continue this exercise, I cannot move to another before this. ***Working Conditions***

This section focuses upon the working conditions within which the teachers participated in their development of teaching at the schools. The teachers were under pressure of their annual appraisals, their completion of the textbook and students' examinations. These limitations affected the teachers' practice and confidence in tackling their new aims of teaching. The teachers' prior experience of their appraisal had minimized their capacities to improve teaching. For example, Sahib's reasons for ignoring the student's answer and imposing his rule (as discussed above) were his negative recall of prior experiences of evaluations by an inspector.

I have to consider an observer's [inspector] thinking during my teaching; an observer could evaluate a teacher negatively when the students give answers that the teacher is supposed to tell them. I have mentioned this issue in my reflective journal also. If you [the teacher] ask a question and a child gives an answer then an observer thinks that the teacher has told him it before hand.

Elaborating his comments, Sahib said that in his prior experience an inspector of the school had misjudged his aims of the lesson when a student had provided an explanation, which was supposed to be given by the teacher as an introduction to that topic. The inspector evaluated the teacher as previously having taught that lesson. The inspector did not understand the capabilities of the child in thinking or appreciate the value of the teachers' questioning in the lesson. Sahib said that the presence of the

teacher educator in the class reminded him of the inspector's perspective, and, in consequence, limited his dealing with students' answers. Sahib expressed his concern also in his reflective journal while discussing the issue of students' equal participation in a lesson. He wrote:

If the students do not give an answer then the school [inspector] thinks that they have not learned anything. If they give unexpected answers then the impression is that the teacher had taught the same concept before. The blame is always on a teacher.

All three teachers had pressure to complete and revise the textbook, so the students could memorize sufficiently and practice to pass their examinations. For example Sahib stated:

I have to complete the syllabus before the final examination. ... We check their memory and skills of drawing [geometrical shapes] in examination; conceptual clarification is not a basic requirement of the examination. If we 'check' [assess] their concepts, none of them will pass the examination.

The teachers also discussed the tensions and frustrations resulting from their low financial and social status in society. Their financial stress required the teachers to do more jobs besides teaching. These teachers asked questions about betterment of their financial status, workload and family responsibilities. **Implications and Recommendations**

The above discussion has shown that the teachers' conceptual and contextual constraints restricted them in conceptualising the underlying assumptions of the philosophy of the teacher education course in the practicality of their new roles in teaching. They experienced difficulties making improvement within existing conceptual and contextual constraints although they wanted to adapt their practice according to new aims of teaching. The teachers were aware of some limitations but did not know how to deal with them.

My view is that by encouraging students to participate actively (contrary to a traditional mode of teaching) teachers effectively open up a possibility of learning with understanding. However, teachers' lack in making sense of students' responses and actually dealing with them may encourage teachers to sustain their prior identity wherein they give preference to their own knowledge and impose their own decisions. Thus, this pattern could sustain a cultural norm of 'underestimating students' strength'; that is, placing blame on elders is not acceptable in parts of Pakistani society where it is assumed that children have low potential for thinking, and wisdom occurs through age and experience. My own development as a learner and teacher also testifies strongly to this analysis. Further, teachers' attempts at achieving child-centred learning within the limitations of their own understanding of new practice may itself cause intellectual, emotional and affective hindrance of students' growth. If a teacher does not understand or deal with students' answers, what is the motivation for students to supply their own answers? In addition teachers cannot develop professionally with their limited content knowledge. Teachers need to enhance their mathematical understanding in order to understand what constitutes teaching of mathematics with reasoning (Ma, 1999). Limitations of mathematics content knowledge can be a big threat for teachers' confidence and desire for developing teaching.

In Pakistani schools, mistakes are generally not accepted because there is a focus on the product, on 'the what' instead of on the process and 'the why'. For example, in one case when a parent asked for clarification of the teacher's explanation (that was different from the textbook explanation), the teacher was threatened. The teacher reverted to the textbook and blamed the student's carelessness in listening to the teacher, because she wanted to avoid further complications and misjudgments. The teacher did not want to be dishonest but more important concerns were her job evaluation and her position at the school. Confessing a lack in knowledge is generally considered as a matter of shame and threat. This is highly embedded in the cultural norms. If teachers make efforts to improve their teaching, they may run a risk that their efficiency will be viewed negatively because it exposes their lack of knowledge and this will be seen as having a negative effect on students' learning outcomes.

The analysis suggests that in order to implement new methods of teaching teachers need time to plan lessons, and to consolidate planning so as to act accordingly in the class as well as to reflect on the outcomes of teaching,. However, time is a constraint in the school. Teachers could correct work and transmit knowledge from one class to another class, in the time available to them, but planning, teaching and learning according to new aims require more time. This leads us (a community of teacher educators) to think about ways to alter the 'time consuming approach' to a 'time reaching approach' in order to increase possibilities for child-centred learning in the real context of a school.

Moreover, due to an unsupportive school culture, routine teaching could be considered a secure, convenient and compensated option for teachers, because it protects their time, stress, position and promotion in the school, although it does not enhance their understanding of their professional development or contribute to students' understanding of concepts. From my analysis, questions emerge for the community of teacher educators: Can teachers achieve any improvement, if the culture works against the teachers' improvement? How can Pakistani teachers maximize their learning capacities if their self-esteem is low? What can the nature of teacher education be in these circumstances and within these limitations? How can we, as teacher educators, liberate teachers from the imposed constraints of schools in their contemplation of change?

Thus, due to the practical constraints teachers may put a layer of 'new practice' on top of their traditional practice in response to what they learn from in-service education but without any integration between these layers. This may prohibit them from acknowledging their inner resistance. This conflict might result in a tension of living between two practices, thereby extending the gap between theory and practice instead of closing it.

The following might assist in supporting teacher development:

- Teachers need help in enabling students to understand mathematics with reasoning if they want to promote their teaching practice. In addition teacher educators need to find ways of enabling teachers to conceptualise their work with pupils in the classroom, i.e., how to get right answers with an incorporation of students' mathematical reasoning and teachers' own standards.

- Teachers need to enhance their mathematical understanding in order to understand what constitutes teaching of mathematics with reasoning. Teacher educators need to have great sensitivity to, and understanding of, the consequences of the teachers' limited knowledge of students' learning as well as implementing the learning from a course. They need to relate the content knowledge the teachers have to teach to their students together with appropriate methods.
- Teacher educators need to address the problem of the length of teaching time required for a lesson and length of non-teaching time at the school as well as how to adjust new teaching in the available time in relation to introducing innovative ideas from the university.
- Teacher educators need to discuss ways to establish a learning environment in the school where teachers focus on students' learning and understanding together with fulfilling textbook requirements with limited resources and within the school expectations.

Change is utterly dependent on the needs of teachers, its compatibility with the reality of the school context and the provision of support. Preparing teachers for change without addressing their needs and providing ongoing support at their school would not allow teachers to acquire a breadth of improvement within their new practice. If teachers' needs and the requirements of a support system are ignored the tensions between theory and practice will continue. I conclude the paper with a comment from one of the teachers:

If I move back to my previous style [of teaching] then there will have been some reasons and pressure. It will not only be my fault. We need to work as a group if we want improvement.

This statement suggests many questions from a teacher to a teacher educator; from a school to a university or from practice of routines to a theory of change.

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