August 2003

Researching practice, practicing research: Impact on teaching and learning

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RESEARCHING PRACTICE, PRACTICING RESEARCH: IMPACT ON TEACHING AND LEARNING

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Abstract

An action research study aimed at finding out the potential of the instructional strategies (whole class discussion, cooperative learning and inquiry) taught at AKU-IED on student learning is being carried out in three phases in five developing countries served by AKU-IED.

The seminar presentation will focus on learnings from the first phase of the research. It will focus specifically on identifying the possibilities and challenges PDTs face in preparing teachers to involve the whole class in discussions and in the teachers using it in their classrooms. It will also focus on the nature of discussions in the classrooms in different contexts and the resultant impact on students' learning.

Introduction

To improve the quality of education in developing countries, AKU-IED developed a model of school improvement through in-service teacher education. In the Masters program, teachers are educated to become exemplary teachers, teacher educators and researchers. Ten years down the road, a key question is: what is the impact of the teacher education program on teachers and students. One way of finding out is through classroom-based action research studies, in which teachers use a particular teaching strategy taught to them by a Professional Development Teacher (PDT, a graduate of AKU-IED) and note the benefits that accrue to students (Anderson, 2001). Such studies would indicate

the potential of the strategies taught at AKU-IED for achieving its goals.

As the MEd class of 2002 was completing their studies I suggested to a group of students representing different geographical contexts the possibility of engaging in classroom-based action research. The aim was to investigate the benefits that accrue to their students' learnings, that accrue to teachers and PDTs, and the possibilities and challenges faced in educating teachers in the use of discussion and action research to continue improving their use of the strategy.

Review of the literature

Educators often view learning from two perspectives, either as a product or as a process. In product-oriented classrooms emphasis is on "what" is learned. The learning usually comprises factual information and description of events. In process-oriented classrooms the emphasis is on "how" information is acquired, that is, the focus is on the processes of learning. Research in most developing countries indicates that teaching is product-oriented (Warwick and Reimers, 1995). Teaching is most often the transmission of textbook knowledge from teacher to the students through lectures and teacher directed question and answer sessions. Students are expected to rote memorize the information and regurgitate it in exams. Successful regurgitation of information presented is accepted as evidence of learning. Teaching and learning of this kind while producing "the best parrots" (Hoodbhoy, 1998) fails to prepare students with the knowledge, skills and attitudes required for personal success and the development of society. In process-oriented classrooms the teachers guide student learning. Students actively participate in investigating problems and discovering information in relation to their questions. The focus on product needed to be balanced with process.

Recognizing the above one of the objectives of AKU-IED's in-service teacher education programs has been to facilitate the development of teachers' pedagogical content knowledge through enhancing teachers' content knowledge and instructional repertoire with process-focused strategies, such as, cooperative learning, inquiry, discussion, to enable them to improve the quality of teaching and facilitate students' acquisition and application of knowledge, skills and attitudes in different situations. In addition, AKU-IED has encouraged the development of the skills of action research so as to enable teachers to continue improving their practice.

Action research (AR)

According to Kemmis and McTaggart (1988), "Action research is a form of collective self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices, as well as their understanding of these practices and the situations in which these practices are carried out". Elliot (1991) defines action research as, "the study of a social situation with a view to improving the quality of action within it". Somekh (1995) cited by Descombe (1998) states that "Action research rejects the concept of a two-stage process in which research is carried out first by researchers and then in a separate second stage the knowledge generated from the research is applied by practitioners. Instead, the two processes of research and action are integrated" (p. 58). From the above it is evident that action research can be described as a process, which pursues action (or change) and research (or understanding) at the same time (Dick, 1993). In most forms action research does this by using a cyclic or spiral process that alternates between action and reflection, which allows one to be responsive to the situation as well as rigorous, thus meeting both action and research requirements. Alternating between action and reflection allows one to continually refine methods, data and interpretation in the light of understanding developed in earlier cycles. In most of its forms it is participative and qualitative (Dick, 1993).

Discussion (DS)

Discussion is a form of group interaction, in which people seek to address a question or issue of common concern to them, with the intention of understanding, appreciating or contributing towards its resolution (Dillon, 1994). Aggarwal (2001) describes discussion "as a thoughtful consideration of the relationship involved in a topic or problem under study. It is concerned with the analysis, comparison, evaluation and conclusion of these relationships" (p. 107). A review of empirical research on discussion (Gall & Gall, 1976; 1990) found that five types of learning outcomes accrue from the use of discussion. These are mastery of the subject matter discussed, problem solving ability, moral development, attitude change, and communication skills. Dillon (1994) notes that discussion as a strategy is usually avoided because discussion does not come naturally but has to be learned, there is a lack of experience of teachers in conducting discussions and there are hindering systemic conditions in school and society. Farooq (1993), describing the difficulties from a developing country perspective, notes that discussion is not usually used in daily practice because teachers believe it can only be applied in

small groups, used for particular topics and is time consuming. He too notes that trained teachers are required to conduct it successfully.

Research design and methodology

The research design used is that of action research. And action research was chosen for a number of reasons. First, there is evidence that many practitioners (doctors, teachers, psychologists) do very little research (Barlow, Hayes and Nelson, 1984; Martin, 1989 cited in Dick, 1993). There is also evidence that practitioners learn more if they subject their practice to deliberate and conscious reflection (Schon 1983, 1987). Second, action research is usually participatory. There is evidence that more and better learning accrues from working with others; that a partnership in which one works together with colleagues is more ethically satisfying and may be more occupationally relevant (Dick, 1993). Third, the PDTs who will be leading this research were introduced to the methodology of action research and some have used this methodology for their dissertations. In addition to this, they have first hand knowledge of the possibilities and challenges of undertaking action research. They have also been exposed to and practiced the strategy of discussion during their MEd Course.

The action research in this study is being conducted at three levels all of which proceed simultaneously. The focus of and outcomes expected at each level are presented below. For the purpose of this paper the action and outcomes at level 2 and 3 are described.

LEVEL	WHO	ACTIONS	OUTCOMES
1	Faculty	Develop understanding of action research and the instructional strategies. Facilitate research through support and challenge. Document the process.	Challenges and possibilities of action research for the teacher educator. Nature of impact at all levels.
2	PDT	Teach action research and Peer-coach teacher; facilitate critico-creative reflection. Document the process.	Possibilities of using action research for teacher education in their context. Changes in self, others and context. Nature of discussion.
3	Teachers	Learn action research and use action research to facilitate use of discussion. Document the process.	Possibilities and challenges in using action research and strategies in their classroom. Benefits that accrue to students in terms of knowledge, skills and dispositions.

Research question

The main research question was: What benefits accrue to students from teachers using discussion as an instructional strategy taught to them by the PDTs?

There were a number of subsidiary questions, the questions this paper will focus on are:

1. What possibilities and challenges do the contextual conditions pose to the learning and implementation of these strategies?
2. What learnings accrued to PDTs, teachers and students from the use of action research to facilitate the discussion in their classrooms?

We decided to co-write the research proposal and to develop a common understanding of Action Research and the Instructional Strategy to be taught. For a week, each day we spent 2-3 hours developing the common understanding through presentations, discussion of ideas and concerns and identifying relevant literature that PDTs could take with them. Two members of the group facilitated each session.

Each PDT, on return to their context met with their heads, discussed the research proposal and got their consent. PDTs invited teachers to participate in the research. They engaged in a reconnaissance of themselves, the teachers and the context. Each then developed teachers' understanding of action research and the instructional strategy to enable teachers to use action research to improve use of the strategy in their classroom. The first instructional strategy, PDTs decided to use, was discussion. The rationale being that teachers already use some form of discussion and therefore they would be starting from where teachers are at. The PDTs supported and challenged the teachers through the stages of planning, teaching and reflection as they used the instructional strategy in their classrooms.

Research sites and participants

The research was conducted in six sites in five countries -- Kyrgyzstan, Pakistan (Karachi and the Northern areas), Tajikistan, Tanzania and Uganda. A brief description of each site follows: Rahat Joldoshalieva worked in the Department of World Languages at Osh State University, Kyrgyzstan with four pre-service English language teachers. Antipas Chale worked in the Aga Khan Primary School in Dar-e-Salaam, Tanzania with two mathematics teachers. Unlike other sites this school was a resource rich school and Chale had an administrative position, which provided greater potential for change. Farah Huma

worked in Habib Girls School, Karachi, Pakistan with an English and mathematics teacher in the secondary section of the school. Besides engaging in teacher education she was involved in classroom teaching herself. Haji Karim worked in a school in the rural areas of Northern Pakistan, which is part of a Whole School Improvement Programme (WSIP). Teachers had some understanding of action research and were very enthusiastic about the opportunity to participate in the study. Nakhat Abdulofizov worked in the Aga Khan Lycee, which is the only private English medium school in Khorog, Tajikistan. Unlike the others his sole responsibility was facilitating teacher education at the school. This involved administrative responsibilities and continuing professional development opportunities for himself as well. Mukobe Margaret teaches at the Aga Khan School in Kampala, Uganda. She started the study with the instructional strategy of inquiry. Her work around action research has been included in this paper.

Action research process - reconnaissance

To understand the research context, the research participants and the nature of teaching and learning PDTs engaged in reconnaissance. They gathered data through the use of semi-structured interviews and classroom observations. Besides the interviews and lesson observations, informal talks also provided data for the study. The findings from the reconnaissance regarding the contexts, the PDTs, the teachers and the students are given below.

The school context

In most schools, there was an awareness that quality of teaching was generally poor, therefore, they offered in-service teacher education. In-service teacher education usually consists of workshops conducted on Saturdays. These workshops were conducted primarily by foreign experts but, to difficult degrees, are now being led by PDTs. Processes like action research or coaching which are ongoing are not well understood nor supported. The exception was the Northern Areas (NA) of Pakistan where the school is part of the WSIP. When PDTs were given permission to conduct the action research, the permission did not entail providing the conditions necessary for the conduct of the research, that is, provision equipment (cassette recorders, transcribers) or time for training (planning, observation and critico-creative reflection) for both PDTs and teachers. Lack of reading material for professional development in general and on action research and subject-specific literature on discussion was greatly felt.

The teachers

With the exception of the NAs and Tajikistan, where teachers had had the opportunity to be involved in school improvement programs, the teachers did not know about action research. In Kyrgyzstan research was perceived to be theoretical and experimental "done in laboratories or in libraries". Teachers questioned, "How can you do it yourself in the classroom?" Some teachers were aware of and engaged in reflective practice but their reflections were descriptive. For most teachers discussion was teacher-questions and student-answers.

The teaching-learning context

Observations showed students sitting in rows facing the teacher and the board. In all school contexts lectures was the dominant teaching methodology. When they were more actively engaged it was usually in answering teachers' questions in single words or phrases. Moreover, responding to questions seemed to be responsibility of the same few students all the time. Students passively absorbed knowledge provided by the teacher. In mathematics classrooms Chale and Haji Karim observed that teachers mostly solved mathematical problems on the board and the students recorded them accordingly. In the context of the NAs the secondary school students felt shy to discuss in the class and thus they resisted talking.

PDTs

As PDTs initiating the study we also reflected on ourselves. We wondered, "Is my knowledge and practice of action research and discussion sufficient to work with teachers?", "Will I be able to support the teachers accordingly?" Furthermore, Haji Karim was sent to a new school. He wondered, "Do I know the context well enough to start making changes?" Most of us on returning to our contexts were told our responsibility was teacher professional development, however, we were soon seen as "a man/woman for all seasons".

Reconnaissance-based action plan

These findings indicated the need to develop teachers' understanding about discussion and action research. The PDTs planned to begin by teaching action research and discussion, then support teachers practice in their classrooms and to gradually encourage teachers to work independently.

Cycle 1: Developing teachers' understanding about AR and DS

As planned, PDTs started developing teachers' understanding of AR while Rahat focused on discussion. All of us, except Rahat, shared reading material on AR with the teachers. However, this idea was challenged when teachers either did not read the article because of their workload or found the reading was too difficult to understand.

In most cases the main focus of the training was on the approach of AR, that is, the cyclic moments of AR and data-gathering techniques. In the case of Rahat it started with a concern emerging from practice. Discussion was used in the class and the teacher was helped to identify a concern from practice through reflection. Group discussion helped to identify ways to address it. This deliberation informed future classroom practice.

Four PDTs, Farah, Karim, Chale and Nakhat, after giving a "small dose" of action research, started to develop teachers' understanding about discussion. They started with group reading of the articles about discussion. The content of the articles focused on the discussion process, organizational arrangement, teachers' role, benefits of the discussion and so on. Teachers and PDTs raised questions and discussed. Rationale, for these sessions, was to introduce teachers to the theory of discussion through using the strategy of discussion and build a common conceptual understanding of discussion.

Cycle 2: PDT-supported practice

Putting theories, into practice was carried out differently across the contexts. For instance, in the case of Nakhat and Karim the planning stages were done collaboratively between the PDTs and the teachers. In both the cases, they co-planned with the teachers. The reasons for co-planning were to meet the teachers' requests and to increase their confidence. The teachers then taught the lesson. Dissatisfaction with the lesson resulted in the request for, Nakhat, to co-teach one of the teachers, and Karim, to demonstrate using a discussion lesson in the teachers own classrooms. After some practice, Farah also had to do a demonstration lesson as the teachers saw the necessity of it.

In the case of Rahat, Farah and Chale, teachers planned themselves. They discussed the plans with the teachers before they taught the lesson in their classrooms. During the teaching process, PDTs observed the lessons. In the case of Rahat and Nakhat they were accompanied by at least one teacher at the early stages of the teaching practices. On completing a lesson, rather than engaging in self-reflection, teachers expected feedback as was given by their supervisors, which were mainly condemnatory and focused on the

teachers' mistakes.

In all the cases, after a number of practice sessions, discussions between the PDTs and teachers were conducted to discuss and address issues that had arisen during practice. Apart from immediate self-reflection and discussions, the writing of reflective journals was another source of information to track teachers' activities in and outside the classrooms. PDTs encouraged teachers to reflect on data from the observations to identify areas of growth and requiring growth. With the exception of the teachers Rahat worked with, all the teachers had engaged in writing reflections. Their reflections, however were very descriptive, non analytical and referred only to self-positive feedback. Teachers were guided through the process of reflecting by asking questions and discussing their reflections as they were sharing them with PDTs.

Cycle 3: Independent practice of teachers

Later on, in almost all the cases, teachers were encouraged to move to working independently. For instance, Rahat moved her teachers to independent practice with another teacher taking Rahat's place as critical friend.

Discussion on findings

Below we discuss the learnings that accrued from the study for the PDTs, teachers and students, from practicing action research to improve practice of discussion in classrooms in developing countries.

PDTs' learning

Doing action research results in self-improvement and understanding of one's own practice. In this action research process, PDTs gained different learning experiences related to teacher education, action research, and discussion. In addition, PDTs acquired some skills of educating teachers and improving their own understanding and actions. Below we discuss PDTs' learning.

Data-based reflection changes practice but is a gradual process

All PDTs realized that teachers took considerable time to change their practice of discussion in their classrooms. We share one Kyrgyz teacher's case, to represent the process of change in teachers' beliefs and practices through databased reflection. Initially,

the discussion ended up either in reverting to previous practice: teacher questions and students' answers, or in a debate between two groups. She reflected, "Today's discussion became a 'battle' between two groups. One group preferred marriage by love, while others chose marriage by convenience". The teacher realized that debate resulted from her favoring one group 'marriage by convenience' than paying equal attention to all ideas emerging. The teacher had also seen her role as a guide and recognized that her talking too much during the discussions left few opportunities for students to participate and so did not allow other ideas and opinions about the issues to be discussed. After efforts to change, she reflected, "In this discussion class, I tried to speak less than my students, though it was difficult for me not to participate". After some time, this teacher emphasized, "Today in discussion, I sat among the students and only answered when I was questioned. Previously I found it difficult to let students lead the discussion, now I have learned to sit among them and observe their discussion". From a case like this reflected in almost all contexts, PDTs learnt that this process of teachers' own identification of issues and changing them takes time.

In addition to this, PDTs learnt that a common understanding of discussion strategy does not mean common practice. From observations and discussions PDTs learnt that discussion looked different in different classroom. A PDT, seeing a teacher begin a discussion class with reading, wondered what was happening and wanted to intervene. She soon realized the teacher had used the prescribed reading to facilitate discussion on the issues addressed therein. PDTs saw the uniqueness of discussion in every teacher's use of discussion brought about by differences in subject matter, teachers, schools and wider contexts. So, 'discussion' became 'discussions'. In this case, action research facilitated creative use of the strategy by implementing teachers.

Action research requires development of skills

PDTs learnt that doing action research for teachers requires several skills and a great deal of practice on them. PDTs, after developing teachers understanding of the process of action research, expected teachers to be able to do action research. However, they found that doing action research requires the development of several skills, such as identifying an area of concern or problem, formulating a question, nonjudgmental observation using data collection tools, reflecting on actions, analyzing data and so on. PDTs are now convinced that each skill has to be taught and practiced by teachers several times. Therefore, PDTs need to support teachers through a number of cycles before they

can expect teacher to work independently. PDTs were impatient with the slow process of teachers' developing skills to do action research given the timetable set for the study.

"Seeing" facilitates "doing"

PDTs learnt that teachers need to 'see' in order to 'do'. Some teachers found it difficult to change their practice of discussion simply on reading and discussing how to do discussion differently. Teachers initially asked, "How will we use it in class?" PDTs were reluctant to demonstrate, as they did not want teachers to copy them but two felt a demonstration of discussion in the teacher's class would enable them to see what discussion looked like in their own classes (Pakistan). Another PDT facilitated teachers to micro-teach using discussion with other colleagues giving creative feedback (Kyrgyzstan). Both strategies seemed to enable teachers to build their confidence in the use of discussion strategy.

Teachers are motivated to learn when they see students' positive learning outcomes

Students' positive learning outcomes served as one of the motivational factors for teachers continuing to use this strategy. In mathematics classrooms teachers and PDTs observed that students started to ask each other questions as well as asking their teachers (Pakistan and Tanzania). In addition, students were able to answer questions like 'How' and 'Why' to demonstrate their understanding of concepts taught. So, teachers needed to see outcomes of their work in their students' learning to further improve their practice of discussion.

Transplanting new ideas into different contexts is challenging

PDTs faced challenges in 'transplanting' the new ideas of action research and discussion strategy into their respective contexts. PDTs faced challenges to introduce action research to teachers in schools and universities in all the contexts except the Northern Areas. Although, teachers in the Northern Areas were familiar with the concept of action research they were not skilled in doing action research themselves. In Kyrgyzstan, action research appeared to be a completely new idea, as the PDT could not find either an equivalent term for action research in Russian and Kyrgyz languages or related literature to read and use in the specific context. University faculty did not seem to accept action research as a research methodology. They initially equated it to 'experimental study' only differentiating it as a 'small' research methodology when they engaged in the process of action research. Furthermore, teachers in schools did not seem to believe that they could carry out research on their own. However, when teachers went through the process

with the support of the PDTs, they recognized it as research and themselves as scientists.

Similar to the experience of action research, PDTs learnt that it was difficult to change teachers' ingrained practice of discussion. Initially teachers tended to revert to old practice despite reading discussions and practice. And teachers tended to blame students rather than see students' behavior as a result of their practices. It took a long time for teacher and students to adopt new roles required in discussion.

Teachers' learning

Teachers, doing action research to study the use of discussion strategy, learnt new research skills, came to better understanding of their own practices and developed some positive attitudes. Learning about and practicing the discussion strategy brought changes to different degrees, in teachers' beliefs and practices.

Enlarge their instructional repertoire

Teachers learned discussion, which contributed to enlarging their teaching repertoire. Teachers reflecting on their previous practices stated, "Before I was using boring method. Like other teachers I also spent time listening to one student only. Now I think it is shameful to do so. Discussion strategy helped me to change my teaching practice". Some teachers stated that the discussion strategy they learnt now was different from what they had thought it to be: teacher questions and students' answers. A teacher commented, "I enlarged my methodology of teaching English. Using discussion I learnt how to involve students in it, how to help students to write a summary of the discussion and how to formulate discussion questions". Moreover, the change in the instructional strategy resulted in other changes.

"Shift" in roles

The teachers' claims of their shift in their role from 'controller' to 'guide' were substantiated by PDTs' observation of discussion in their classrooms. Teachers perceived their role as to lead and control students' so that their classroom interaction patterns were one sided. Teachers thought this was necessary because as a teacher exclaimed, "I want to tell students some things which they do not know…. I want to summarize discussion myself as they cannot do it". Teachers acknowledged, "It is difficult to change oneself as teachers used to be at the center of discussion and making conclusions". At the initial stage, some teachers even showed resentment to share their power with the students in

discussion. Although, giving up authority was painful for teachers later they were more willing to share their roles with students. With the shift in roles, teachers' initial beliefs, that "Teachers should be respected", or "There should be a boundary between teachers and students" were also challenged. Due to constant practice of discussion strategy and reflecting on it, teachers came to see themselves as an equal member of discussion.

Skills and dispositions developed

In the process of doing action research on the use of discussion strategy, teachers developed some skills and dispositions. Teachers learnt to formulate open-ended questions, which were 'discussionable' in order to open up discussion to different opinions, ideas, experiences and information. Teachers acknowledged that probing questions enabled students to think deeper, to think about their thinking and answer further. A mathematics teacher stated, "If students are stuck, the teacher has to click on them, questions help them to think deeper rather then give an answer at once". And questions like "What do you think…?" "How would you act?" served for the purpose.

Planning and reflecting for lesson were other skills which teachers claimed to develop. These skills seemed to be developed gradually by practicing them. PDTs also noted that teachers shifted to plan 'in minds' or 'with some notes' to writing detailed and comprehensive lesson planning later. Teachers acknowledged that they learned to think on lesson planning before implementing it. The strategy of discussion facilitated the development of new dispositions. Initially, teachers were impatient and did not wait for students' answers filling in the silent moments. They jumped in to check students' mistakes in pronunciation and grammar (English) and when students did not give the right answer (Math). However, from using discussion, teachers learned to be patient and humble. PDTs observed teachers who provided wait time, which was acknowledged as an opportunity for the students to think and collect thoughts. In English classes initial lessons using discussion rather than accuracy, which was a common practice, focused on fluency. Teachers recognize that identifying and improving mistakes was not only teacher's task but had to be shared by the students. They collaboratively worked on improving mistakes using audio and video recorded discussions.

Learning from practice

Teachers acknowledged that they learnt from their own practices. One teacher stated, "Apart from theories and books, I can learn from reflecting on my own practices". While practicing the discussion strategy teachers learnt to formulate open-ended questions,

choose topics, which are related to students' experiences and life and facilitated learning of social skills and students' participation by developing a set of "Golden Rules". Teachers also learnt to use students' peer evaluation of participation, which helped them to compare with their assessment on participation.

Teachers learnt to identify and act on specific problems they faced in using action research. For instance, one teacher specified her research question as "How can I enable all the students to participate in discussion?" And in her later reflection she shared "I never thought of identifying problems in using a strategy and working on them. Now I have begun to notice my mistakes and try to act on improving the situation". Focusing on specific problems teachers learnt to focus at alternative actions, make decisions, plan for recording observations, and reflecting on actions. However, by its nature action research requires commitment to work documenting action, reflecting on them and making commitments to take actions to improve the situation. To do this, teachers were required to read and study to develop questions, identify problems and take actions. Often teachers felt overburden trying to combine a demanding workload with systematic and rigorous research (Dick 1993).

Students as a resource

Teachers who initially saw themselves as 'the' source of knowledge started to not only see students as a source but also as resource for their learning. Students brought different news into discussion based on their diverse experiences. A teacher said, "Discussion helped not only students but even myself. I got some information from my students" (Tanzania). However, teachers also acknowledged that as teachers, they should know more about the topic under discussion, but accepted and recognized that students could provide information from which they could learn. University teachers realized this more acutely given their students' diverse background and experiences. A teacher reflected, "I realize I could have read more but I can not be expert in all areas. I was learning from listening to my students. It is a shame I did not recognize this before" (Kyrgyzstan).

Students' Learning

Identifying students' learning outcomes was difficult given the issue of defining the nature of learning. Chale expressed this concern, "When I compared students' test scores before and after the research process, I found no difference". This led to other PDTs challenging Chale's conception of 'learning'. Margaret suggested, "Chale, you have looked at learning as content knowledge, as that's what tests measure. I think we need

to look at learning more broadly, including understanding of concepts, skills developed and attitude changed". Chale pointed about what stakeholders wanted to see change in test scores as they equated them with learning. Haji Karim emphasized that there was a need to educate stakeholders to view learning broadly. He further stated, "Having content knowledge is not enough. Research shows that understanding content is important but skills are transferable to other areas and useful for life. Positive attitudes and dispositions facilitate the learning and understanding of content. Even teachers acknowledged that in the long run many positive learning outcomes would emerge from teaching using discussion" (Pakistan).

After this debate we were able to look at students' learning outcomes in terms of understanding of concepts, skills developed and attitude changed due to the use of discussion strategy.

Understanding of concepts

Students demonstrated their understanding of concepts discussed. Initially, in mathematics classrooms PDTs and teachers observed that common practice used was following algorithms and practicing rather than asking students to demonstrate their understanding. If previously math teachers' focus was on the product that is, the right answer now it was replaced by focusing on students' understanding process and explaining their answers. Teachers probed students, "Why do you think so?" "How did you come to this?" and other similar questions. A math teacher shared, "Through discussion, my students have learnt to solve math problems in different ways" (NA). In English classrooms, students appropriately used new vocabulary related to the topic under discussion, demonstrated understanding of the vocabulary.

Skills developed

Students developed social, academic and communication skills while engaged in discussion. Students together with their teachers created "Golden Rules" for discussion, which required students to demonstrate social skills such as taking turns, listening to each other, respecting each other's ideas and acknowledging differences of ideas. Students also learnt to support their ideas and opinion with concrete evidences not only from their own experiences but also from literature, newspaper articles and so on. In addition, students learnt to write discussion summaries. Students demonstrated their communication skills by asking questions, seeking clarification and extending of ideas.

Attitudes changed

Apart from demonstration of understanding and skills, teachers and students perceived the development of some positive attitude from the use of discussion. Initially PDTs and teachers observed students unwillingness to share their ideas negating each other's ideas and refused to recognize differences of views. Gradually, they realized they could learn with and from each other and became more willing to share their ideas, accepted different ideas and views and provided evidence to support their own view. They even became more responsible and independent learners by finding materials to use as evidences to support or reject the views and ideas presented. PDTs and teachers observed 'gain' in some students' self-confidence and self esteem overcoming their shyness and fear of being questioned and answering 'wrongly'.

Concluding remarks

Given the differences in school systems regarding understanding of teacher professional development, teacher and PDT workloads and support of the administrations led to the emergence of contextually relevant models of teacher education. For instance, in Chale's case, he worked with the teachers on planning and reflection. However he rarely observed their lessons. Hence, his role became less apparent and less dominating, thus, enabling the teacher to do research independently. Chale did this, as he wanted to work as much within the existing system as he could. Rahat worked with four teachers, this enabled her to divide teachers into pairs for planning and observation but bring them together for group discussions on similar issues.

PDTs recognized that their facilitation (support and challenge) 'whet the appetite' of teachers to learn not only the new strategy and research skills, but also using the strategies they realized that they could learn by reflecting. In using to learn by reflecting strategies, teachers realized that they could. PDTs questioned, "To what extent and for how long should PDTs support teachers in conducting action research? What will ensure the teachers' continue using discussion, and more importantly, action research to improve practice?"

While writing this paper the messiness of the action research process disappear and it appears seamless. However, during the process PDTs had to address several questions and issues related to the process, for instance the "backing and forthing" rather than consistently moving forward. Moreover, differences in contexts, school systems, culture, subject areas, and even classrooms were apparent but appear erased here. In the quest

for systematic documentation, PDTs wanted to document each and everything that raised the question, "How do we document the lived experiences of PDTs, teachers and students during the action research process?"

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