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ABSTRACT

This paper describes the evolution of an anecdote-based model of professional development. The nature of professional development is discussed, including case-based instruction and the use of anecdotes. The context for this investigation is presented; this professional development program was targeted to K-12 mathematics teachers who desire to recreate their practice in a manner consistent with mathematics reform initiatives. Through detailed analysis of classroom videotapes, the researchers identified the dimensions around which teachers' practice varies and types of contexts created in classrooms that influence students' opportunities to engage in mathematical thinking and reasoning. Problematic issues identified in teacher discussion sessions were consistent with those identified by the researchers' analysis of classroom videotapes. A set of videotapes that focused on these issues was developed, supplemented with a leader's guide. The suggested steps for working with anecdotes were: share an anecdote; reconstruct the details; view the anecdote again and think of related anecdotes; distill or interpret the issues; identify a personal plan; take to practice; and repeat the cycle with individual teachers' tapes. It was concluded that this model can be applied in a variety of contexts where the goal is to empower professionals to develop and improve their own practice. Contains 16 references. (DLS)

Wait 'Till Ya Hear This One: Professional Development through Anecdotes

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This paper is part of a larger their practice of teaching mathematics to be consistent with reform initiatives, and 2) investigating a model of professional development that addresses problematic issues for the teachers. For us, as instructional designers investigation that has the dual goals of: 1) determining problematic issues for teachers as they change and developers, the problematic issues addressed though the professional development process are not as important as how the teachers' knowledge is generated and shared; thus I will focus on the second goal of our investigation. This paper will describe the evolution of our model of professional development as we explored techniques to incorporate technology to provide social support for changed practice.

Nature of Professional development

The professional development of practicing professionals often involves modifying or expanding upon deeply seated ideas and beliefs about the way their business should be conducted. Teachers embark on the mission of teaching with implicit and explicit beliefs about the way classrooms should be managed and content should be taught. These beliefs may be implicit or explicit, but they are the summation of a variety of factors including prior experiences with their own teachers, knowledge gained from coursework or independent reading, and perceptions of themselves in the role of teacher (Kagan,1992). As such, the professional development of individuals with experience in a given area of practice may require that they reconceptualize their professional roles and responsibilities (Goldsmith & Schifter, 1993).

Most attempts to change the practice of experienced teachers have consisted of experts training teachers in new practices (Feldman, 1996). "While these types of inservice education can be effective, they make little use of the expertise of the teachers being inserviced." (Feldman, 1996, p. 513). The challenge for me as an instructional designer was to develop teacher education activities that worked with the teacher, rather than worked on the teacher. Our intent was to create "instruction" that would provide opportunities for teachers to identify issues that were relevant to them and to enhance their practice in areas that were personally meaningful to them.

In addition, we wanted our approach to professional development to be consistent with the theoretical basis of their classroom curriculum. Based on a Piagetian approach to learning, conceptual change occurs through experiences that induce cognitive conflict and indicate inadequacies in current thinking (Piaget, 1985). Learners should be actively involved in trying things out to see what happens, posing their own questions and seeking their own answers, reconciling what was found at one time with what was found at another, and comparing their findings with those of others (Driscoll, 1994). Through the processes of assimilation and accommodation teachers may reconceptualize their roles as teachers (Goldsmith & Schifter, 1993). Through assimilation, new ideas are incorporated into existing schemes; through accommodation, existing ideas are modified to account for new experiences. New ideas must be consistent with learner's experience in order to be acceptable to the learner; modified ideas must account of all new and previous data. In addition, interactions with peers are an important source of cognitive development; through social interactions, as well as through action, learners can become dissatisfied with their existing knowledge. Through comparing their ideas with the ideas of others, learners may find new ideas that are plausible and useful alternatives to their current conceptions (Goldsmith & Schifter, 1993). We wanted to create opportunities for teachers to express and examine their beliefs, values, and practice, and to compare those personal beliefs, values, and practices to those of others.

In addition, many skills needed by these professionals are "ill-structured" (Jonassen, 1997). Ill-structured problems are those for which multiple opinions and perspectives exist; in order to find a solution, reflective judgments must be made about the advantages and disadvantages of a particular solution for different people and contexts. Often there is no "right answer" to dilemmas they may face, only a collection of possible solutions or options.

Cases for professional development

Case-based instruction can provide opportunities for conceptual change to occur and meet the conditions for teaching in ill-structured knowledge domains (Driscoll, 1994; Jonassen, 1997). Cases provide a context through

which learners can explore dilemmas and solutions. They can be a description of a real event, a modification of a real event, or a fictional event. Typically, a case discussion begins with the presentation of the case, a discussion of what is know and not know (relevant facts of the case), and discussion of possible interpretations and solutions to the case dilemma.

They are particularly useful for novices in a content area (preservice teachers, for example) in that they provide a point of reference. Often preservice teachers are unable to imagine what it would be like to be a teacher. They lack a frame of reference to which to apply the new knowledge gained in coursework. They emerge from their education with an idealized view of teaching. And when faced with the complexity of the classroom environment, may abandon what they learned and instead, react by teaching in the way they were taught. They may be unable to resolve conflicts between what they have learned about teaching in their university classes and what they know about teaching from their prior experience, in face of the realities of the classroom.

Experienced teachers enrolled in professional development activities, on the other hand, already have a current frame of reference in which to consolidate their new knowledge. They are acutely aware of the realities of the classroom. We wanted to find a way for practicing teachers to explore new ideas about teaching consistent with reform initiatives and consolidate new ideas with their knowledge gained through practice and the "apprenticeship of observation" (Lortie, 1975). In addition, we wanted to provide social support for changed practice in an arena where teachers could capitalize on their own experiences and those of their peers to explore issues relevant to reform-based teaching of mathematics. And finally, we wanted to provide an opportunity for them to extend their modified ideas to their classrooms.

Anecdotes for Professional Development

Similar to cases, anecdotes of teaching episodes have provided a means for teachers to work on their practice in a variety of content areas (Feldman, 1996; Joworski, 1989; Mathematical Association, 1991; Stock, 1993). An anecdote is "a narrative of a detached incident, or of a single event, told as being in itself interesting or striking" (Oxford English Dictionary, 1971, as cited in Feldman, 1996). Like cases, anecdotes situate "specific teaching-learning moments in the material circumstances in which they occur" (Stock, 1993, p. 185).

In her discussion of the use of anecdotes to examine teaching and learning in English classrooms, Patricia Stock (1993) proposed that teachers continually develop their understanding as they recreate the anecdote through successive retellings. "That teachers tell anecdotes when discussing their teaching is common knowledge. What is not generally recognized are the functions that the shaping, reshaping, and rehearsing of anecdotes play in the research we informally and- I would claim- systematically conduct into our practice" (Stock, 1993, p. 184). By drawing attention to specific incidents in their teaching, teachers invite others to join them in attempting to make sense of the incidents in order to improve their practice (Stock, 1993).

Allan Feldman (1996) also determined that anecdotes played a significant role in teachers' research into their own practice. He convened a group of eight physics teachers to engage in collaborative action research on their practice. The group meet for one and a half hours approximately every three weeks for two years. Feldman audiotaped the sessions to examine "the ways that teachers' knowledge about teaching and their educational situations grow when they are engaged collaboratively with other teachers in inquiry on their own practice" (Feldman, 1996, p. 513) Upon analysis, he found three practices pervading their work together: anecdotes, trying things out, and systematic inquiry.

The role of the anecdote was critical throughout all three processes. Often, teachers would relate an anecdote. Others would respond in one of three ways: by telling a related anecdote, by asking for details of what was described in the anecdote (who, what, where, how, and when), or by asking questions that would provide them with a better understanding of the situation described in the anecdote (why something occurred). When teachers decided to "try something" new, they often tried something that had been described in another teachers' anecdote. When the teachers "tried something" new, they often reported the incidents to the group as anecdotes. And when teachers engaged in systematic inquiry, a narrative analysis of their classroom practice seemed more powerful to them than following traditional scientific methods. The teachers treated the narrative analyses and accompanying data the same way they treated the anecdotes: through relaying other anecdotes, through asking for details, or through questioning for meaning.

Feldman (1996) believed each of these responses to an anecdote was of value to the participants. When teachers responded to an anecdote with another anecdote, the additional anecdotes added context and begin to "indicate to others how their knowledge is related to the situations of the tellers" (Feldman, 1996, p. 522). When they responded with questions that asked for details, "they were seeking information that would help make the

knowledge and understandings presented in the anecdotes more useful" to their own experiences (Feldman, 1996, p. 522). And finally, questions that focused on the understandings that the anecdote tellers had of their situations shifted the focus from the specific details of the anecdotes to interpretations of the events that were relayed in the anecdotes.

These stages in responding to anecdotes are similar to the stages Barbara Jaworski (1989; Mathematical Association, 1991) has outlined for working with anecdotes for professional development. In her workshops with mathematics teachers, she presents an anecdote, either written or on videotape, and has the teachers move through a structured approach of providing an *account of* the events in the anecdote, followed by *accounting for* the events. In her workshops, groups of teachers

- view or read an anecdote (relay anecdote)
- construct an *account of* what they saw or read (clarify details)
- try to *account for* what was seen or read (interpret). In accounting *for* their interpretation of the anecdote, they share related episodes in their own teaching as examples (share anecdotes).

The work of these researchers and teacher educators indicates that anecdotes can provide a concrete reference for practicing teachers, a way of envisioning how ideas would work in their own classrooms. In addition, as a means of professional development, anecdotes rely on the expertise of the teachers and their ability to construct and share knowledge and understanding. Thus, we chose to extend upon the work of these researchers in several ways. We wanted to ensure that the teachers would extend the ideas examined during our professional development activities to their practice. In addition, we wanted to provide opportunities for the teachers to work on their practice over an extended period of time.

In addition, we believed that a video-based professional development program could support in-service teachers as they experimented with new curricular and/or teaching approaches. Common approaches to using videotape include the use of video to construct case studies of exemplary teaching practice. But although video-based demonstrations of "expert" teachers may encourage replication, it does not encourage exploration of issues of personal interest. We wanted to investigate ways that learning environments can be designed to be customizable by teachers and how videotapes can be used to provide opportunities for teachers to link new ideas to their own practice. Building from our examination of the use of anecdotes for professional development of practicing teachers, we explored a video-based approach to professional development using anecdotes.

Context of our investigation

Large-scale K-12 mathematics curriculum reform efforts have been underway for several years (National Council of Teachers of Mathematics, 1989). As curriculum is reconceptualized to emphasize project-based approaches to the development of understanding, the role of the teacher is changing. These changes require a skills in facilitating and coordinating learning experiences for individuals and groups of students; teachers need to conduct active, productive discussions of mathematical ideas.

This professional development program is targeted to teachers who desire to recreate their practice in manner consistent with mathematics reform initiatives. The teachers may be in their first year of practice, or may have many years of teaching experiences. However, all are attempting to modify their practice consistent with reform initiatives. As teachers will voluntarily choose to develop their skills in reform based mathematics teaching, we assume that teachers will be convinced of the value of giving students responsibility for their own learning prior to becoming interested in this professional development program. It is possible that the teachers may have experienced previous frustrations when teaching in this manner. However, we are assuming that the teachers are motivated to succeed and confident that they could successfully develop their practice . Typically, teachers place high value on the learning of their students. Thus, we believed the initial activities should demonstrate the value to the students of adapting alternative methods of teaching mathematics. In addition, we assumed the teachers would like to quickly apply what they learned to their classroom context.

As an instructional design and development team, we began our conversations with discussions of what kinds of "changes in thinking" we wanted to see in the teachers. We knew there were differences in teachers' practice in mathematics class, even though all the teachers all were using the same problem-based math curriculum . However, we were unsure of the nature of these differences.

As we had no answers, we moved to a discussion of how we would know that changes in thinking had occurred. We decided to analyze videotapes of classroom mathematics lessons to identify differences in practice among elementary mathematics teachers. Using a data resource which consists of approximately 200 videotaped lessons collected over a period of one year in five second-grade mathematics classrooms, we developed a classroom

coding scheme, coded, and interpreted the teacher's and students' actions (Wood, Turner-Vorbeck, & Walker, 1996b).

Differences in teacher's practice

Through detailed analysis of videotapes of classroom practice, we identified three dimensions around which teachers' practice varies (Wood, Turner-Vorbeck, & Walker, 1996a; Wood, Walker, & Turner-Vorbeck, 1996).

- Although all the teachers had their students vocalize their way of thinking about mathematics, the teachers varied in the meaning they hold for "children's thinking". Some teachers had students report their solutions to the problem, others required them to tell how they solved the problems, and others asked students to tell why they did what they did .
- Teachers also varied in the extent to which they allowed disagreement: some set up exchanges that were primarily between teacher and student; others established exchanges between students and the rest of the class.
- We also discovered that when children shared their ideas, teachers varied in their expectations for active participation by the "listener" and "explainer".

From this analysis, we developed a theoretical framework that clarifies issues that may be important to teachers as they develop their mathematics teaching. We identified three types of context created in classrooms that influence students' opportunities to engage in mathematical thinking and reasoning: reporting of solutions, inquiry into the solutions, and argument about the solutions. These contexts are a result of ways in which teachers establish with the children the social norms or expectations for behavior in mathematics class. As teachers and their students move vertically throughout the model, students move from reflective thinking to critical reasoning; as they move horizontally, students take greater responsibility for learning. Having identified issues around which practices vary, our challenge was to develop activities that allow the teacher to explore these issues in their classrooms in personally meaningful ways.

Development of the plan

Simultaneously, with our analysis of classroom videotapes, we begin to develop our way of working with teachers. Using the work of Barbara Jaworski and the Open University(1989; Mathematical Association, 1991) as a guide, we developed a tentative way of working with teachers to promote reflection on the practice of mathematics teaching.

In the Spring of 1996, we tested our way of working with seven teachers who participated in ten two-hour teacher development sessions. In these sessions, teachers selected video segments from their own classrooms to illustrate issues of importance to them. Although we had developed a tentative pattern for discussion, we continually reflected on and modified our way of working throughout the sessions to determine the sequence and questioning approach that was most effective in generating discussions of multiple solutions to problems and issues. As we conducted these sessions, we recorded our expected actions for the session prior to the session, videotaped the sessions, recorded field notes, and made reflective notes following the session. The videotapes were logged for analysis. The participants also recorded their reflections and assignments in a notebook. We analyzed these data to identify patterns of behaviors and responses, to determine if the issues teachers identified as important in their classrooms were similar to the issues we identified as important based on our analysis of classroom videotapes, and to refine our way of working with the teachers. After our analysis revealed that the problematic issues that arose from the teacher sessions were consistent with those we had identified from our analysis of classroom videotapes, we felt confident in developing video segments to focus discussions on identified issues.

The plan

From our analysis, we developed a set of videotapes and supporting leader's guide for professional development of elementary mathematics teachers. The materials consist of a series of five videotape segments of mathematical discussions as they occurred in elementary classrooms. The videotapes are supplemented with a "leader's guide" that outlines our way of working with anecdotes. The leader's guide includes statements that should be made to the participants and notes to guide the discussion of the sessions. However, the teacher leader is not the authority in the session, only the moderator, who is charged with moving the discussion forward, to moving beyond anecdotes to identification of issues and plans for action. The leaders role is one of chairing the session. He

or she should ensure that all participants get a chance to voice their opinions and thoughts and should mediate so that all may have an opportunity to do so. The leader's guide contains video notes, which indicate possible issues that may arise from the videotaped segments, or possible paths the discussion may take.

As planned, the professional development sessions we conducted with teachers were to follow the steps outlined below:

1. Share an anecdote. We initially prepared a set of five videotaped "anecdotes". These anecdotes were segments from actual elementary mathematics classes. The segments were selected because they illustrated a particular "block" in our framework. However, we recognize that classroom events are complex; and that each segment could be interpreted from a different perspective than the one for which it was selected to represent. The materials allow for this flexibility. The teacher working sessions begin by showing a videotape anecdote, corresponding to one "block" in our framework.

2. Reconstruct the details of what was seen on the videotape. After viewing the videotape, individuals mentally reconstruct the events of the videotape. Participants spend about five minutes working in pairs to agree on what was seen on the tape, then join together as a whole group and spend about ten minutes discussing what was seen on the videotape.

3. View the anecdote again and think of related anecdotes. Participants watch the videotape a second time, paying attention to what the students may be thinking as they are participating. As the group discusses the events from the perspective of the student, they consider what the child talking thinks he or she is expected to do and what the children listening think they are expected to do. Participants reflect on how the actions of the students are similar or different from what happens in their classroom. They are asked to think of one small event from their own classroom that relates in some way to the events of the videotape and record their reflections in their notebook. The video simply provide a shared classroom experience from which discussions of individual issues could begin. The most important aspect of the discussions involves participants examining their own situations.

4. Distill or interpret the issues. In pairs, participants exchange ideas of how the discussion is similar or different from what they observe their own students doing and saying in their classroom. Then pairs try to identify the themes that lie behind their experiences. The entire group joins together and spends 15 or 20 minutes discussing the theme or issues that pairs identified in their discussions. General statements and interpretations should be illustrated with "for instances" from their own experience. Using participant's own experiences as "for instances" grounds their statements in their practice, illustrates ideas more clearly, and encourages participants to reflect on their own practice.

5. Identify a personal plan. Participants spend a few minutes individually reflecting on specific action that they may want to try out in class to further explore the issues they identified as important. Actions may include looking out for occasions when certain things happen, trying some new approach, or making some small changes in behavior. Then participants join together as a group and spend about ten minutes sharing their ideas for action. Participants are directed to consider the issues identified and possible action steps, and individually think about their expectations for future math discussions in their classrooms.

6. Take to practice. Participants videotape one or more class sessions to document events in their classrooms. Before they videotape their classes, they are to list their expectations for themselves and their students in their notebook. After they videotape the class, they are to review the videotape and compare their expectations to the actual events that occurred in the classroom, recording their reflections in their journal.

7. Repeat the cycle with individual teacher's tapes. When the teacher development group reconvenes, each teacher brings his or her own videotape and anecdotes of classroom events to share with the other teachers. The process of working with videotaped anecdotes is repeated with individual teacher's tapes until the group decides to move to another issue.

Findings

We begin to use our "way of working" with a group of teachers in the Fall of 1996. Through the last 18 months, we have made the following observations:

Things don't always proceed according to plan

Although we initially used a video "anecdote" as a means of initiating discussion on similar events in the teachers classroom, and followed our way of working with videotaped anecdotes, we found that as soon as teachers begin videotaping in their classrooms, we never returned to viewing the prepared tapes. Teachers were enthused about bringing in their own tapes to discuss with the group, and wanted to continue in this way. One issue lead to another, and recognizing teachers desire to work on their own classroom, we allowed them to continue in this way.

In addition, we found that this second group of teachers seemed to need to focus on what the students were thinking. We recognized from the beginning that teachers were more comfortable focusing on the children's responses than focusing on the actions of the teachers, but believed that they could quickly make the connection between what the children were thinking and the classroom norms established by the teacher. We found that was not true: they were simply unable to judge what children were thinking from their responses to math problems.

Thus, the focus of our discussions and videotapes that were shared shifted from an examination of teacher's behavior to a focus on children's mathematical thinking. We realized that this group of teachers lacked an essential prerequisite for focusing on the issues we had identified. Our initial set of videotapes was created to be a rich environment where anecdotes of classroom events could be examined from many different perspectives. However, once the focus of discussions shifted to an examination of children's thinking, we found we had no videotapes appropriate for the altered focus. We depended on teachers to bring in tapes of their own to examine as a group.

With experience, stages in the process merge, alternating between examining details, relating anecdotes, and interpretation.

Currently in the teacher's working sessions, each teacher shares her videotape; discussions merge the "reporting of" details with the anecdote telling and interpretation stages. Although the elements we included in our way of working are present in the sessions, they no longer exist as formal concrete steps. Instead, teachers discuss interpretations, backed by details from the tapes. They share instances where they see their students behaving in similar or different fashions when appropriate. Teachers move seamlessly among the stages in the process, in an cyclical, iterative manner rather than the formal linear sequence we outlined. The teacher educator has to do much less questioning and leading of the discussion than initially. This way of analyzing and discussing video anecdotes has become a natural way to view videotapes.

Comparing expectations with videotaped events is useful for reflection.

The use of anecdotes, in our case as videotaped examples of incidents from practice, can be enhanced through the active process of recording expectations prior to teaching a lesson, teaching the lesson, and reflecting back on the lesson in light of expectations for the lesson. Currently, teachers videotape their students solving a mathematical problem and vocalizing what they are doing and why. Before they tape the sessions, they list their expectations for the children in their journals. As they view their videotapes, they reflect on what happened. The teachers share these videotapes in their working sessions with the group. We have found that the tapes and journals provide a very effective means of assessing what the teachers are thinking about teaching and learning mathematics in their classroom. In addition, the theoretical framework we developed from our analysis of classroom videotapes is useful means of categorizing teachers' thinking.

Teachers are reluctant to conduct similar discussions on-line

Currently, the teacher working sessions are devoted to examining what children are thinking. However, between teacher working sessions, the teacher educator posts action items to a web site and teachers are expected to work on problematic issues that arise in conducting active productive classroom discussions on-line. They are asked to a)record their expectations for their class discussion, b) conduct and videotape their class discussions, c) compare their expectations for the class discussion with what they observed on the videotape, and d) discuss their expectations and what happened with the other teachers in the group though e-mail and listserves. However, for one reason or another, the teachers have not participated in these discussions on-line.

Conclusions

The purpose of this presentation was to outline a "way of working" with anecdotes that channels our natural tendencies to share our stories with colleagues into a strategy for the continued development of practicing professionals. Think back to the last time you sat around a teachers' lounge or met with a group of professionals who work primarily in isolation. Sooner or later, they began telling anecdotes about the workplace. One anecdote leads to another. Participants share stories and develop a sense of community, a sense that they are not alone in their frustrations and joys. But conversations of this nature seldom go beyond developing a sense of shared experiences. Although we investigated our way of working with elementary school teachers of mathematics, this model of professional development can be applied in a variety of contexts where the goal is to empower professionals to develop and improve their own practice.

This approach offers teachers a way of working first as a group with a teacher educator, and later individually as they examine their own classroom context for learning. We have provided support materials and developed a professional development model that encourages teachers to use video vignettes to focus on issues that arise in their classrooms. In this regard, an attempt is made to link the work done as a group to practice in classrooms using video as a tool the bridge the traditional gap between teacher education and classroom practice. The video anecdotes serve as a shared experience to generate discussion of issues in their own classrooms. By working though the steps in the process, the group receives support as they extend the ideas that emerge through the group discussion to practice in their classrooms. Members of the group work together collectively to identify issues, share experiences, and learn more about creating contexts in classrooms for learning mathematics with understanding.

Currently, the project team is analyzing videotapes and journals from the teacher's working group to determine how teachers create and modify their knowledge through participating in this type of professional development program and exploring ways to extend this methodology to distributed learning environments. Although we have began to explore the use of anecdotes for the professional development of elementary mathematics teachers, this approach to professional development is a logical extension of the case method with applicability to the professional development of any practicing professional; I encourage others to explore the use of anecdotes in other contexts and with different groups.

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