Pre-Service Teachers Early Field Experiences:
Cultural Historical Activity Theory

Lisa Kasmer,
Department of Mathematics,
Grand Valley State University, USA.
E-mail: kasmerl@gvsu.edu

Abstract
The aim of this study is to investigate the dilemmas and contractions pre-service teachers face as they embark in early field experiences, and the subsequent instructional decisions they make. The results suggest many pre-service teachers are able to recognize when they need to make shifts in their instructional decisions, but often struggle to incorporate these decisions in future planning.

Key Words: Pre-service teachers, early field experiences, Cultural Historical Activity Theory
1. Introduction

The nature and structure of field experiences for Pre-Service Teachers (PSTs) often shapes their vision for teaching. Mewborn (2000) proposes that early field experiences during PST education can potentially be a positive influence on beginning teachers' views of themselves and the way they intend to teach. Typically, these early field experiences offer PSTs their initial opportunity to practice and begin to develop the art of teaching. Moore (1995) believes that more attention should be placed on the content that is taught, how it is taught, and what is learned from it. In addition, Greeno, Collins, and Resnick (1996) contend that the context in which a PST first teaches plays a fundamental role in shaping what is learned, and according to McIntyre, Byrd and Foxx (1996) what transpires during their field experience is more significant than the length of the experience.

PSTs need to develop and construct new knowledge in situ, which, as Richardson (1996) suggests, “is the only way to develop the practical knowledge that eventually makes routine at least some aspects of classroom practice and provides alternative approaches when faced with dilemmas” (p. 113). This new knowledge can stem from early field experiences in which PSTs are provided with opportunities to face dilemmas or tensions as they consider and enact productive instructional decisions in order to effectively teach mathematics to students. The specific tensions they face and the revisions they make provide opportunities for PSTs to develop and construct new knowledge. This early field experience in Tanzania presents many occasions for the PSTs to revise their work and begin to develop the practical knowledge needed to teach mathematics in an unfamiliar context. Identifying these dilemmas and the revisions the PSTs are able to execute is important as we continue to consider more effective ways to prepare PSTs for the rigor of teaching mathematics.

2. Literature Review

Cultural-Historical Activity Theory (CHAT) provides the theoretical framework that will situate both the activity and analysis of this study investigating the PSTs’ cycles of tensions, instructional planning, lesson enactment, and reflection on their teaching relative to their work in mathematics classrooms. Three fundamental concepts frame the Cultural-Historical Activity Theory: the activity system, the contradictions, and expansive learning (Engeström, 1999). As Meyers (2007) explains:

Learning is not an isolated act; rather it is situated in time and space and influenced by the surrounding actors, resources and behavioral constraints. One should also recognize that agents in the learning process, through their activities, influence the contexts in which such learning takes place. Cultural-historical activity theory, then, as a dynamic model, is particularly appropriate for the study of educational practice.
The activity system highlights the practitioner, colleagues, and the professional community where they share common experiences (Engeström, 1999). Contradictions (dilemmas and tensions) are one of the defining features of Cultural-Historical Activity Theory. The contradictions that surface and their subsequent resolution form the impetus of new practices (Meyers, 2007). In the context of this particular proposed study, the contradictions (dilemmas and tensions) are the obstacles the PSTs face as they teach their mathematics lessons. Engeström (1999) describes expansive learning as using contradictions as a catalyst for changing activity systems. Contradictions should serve as a change agent for innovation and improvement of practice.

This expansive learning cycle supports the Hiebert, Morris and Glass (2003) “experiment” model for teaching and teacher preparation in mathematics. As Hiebert et al suggest, it is important to consider the type of setting PSTs are provided in order to influence their own learning. They contend, furthermore, that PSTs may not develop adequate competencies in their preparation programs and must learn to teach by taking advantage of new knowledge gained by themselves and others. When PSTs are given opportunities to learn from their experiences, they are in a better position to learn more effective strategies (Hiebert et al. 2003). Providing PSTs opportunities to study their teaching affords them the chance to develop tools for monitoring and examining their own practice and the impact of their instructional practices, which enables them to learn from their experiences.

Hiebert et al (2003) further explain that PSTs should consider the lessons they teach as experiments. That is, PSTs must be able to design lessons with well-articulated goals, monitor their implementation and instructional practice, gather feedback, and reflect on their practice with the intention of revising, changing, and improving on future practice. Thus, the Cultural-Historical Activity Theory, and this learning-to-learn-to-teach “experiment model,” shares many of the features of design experiments—a teaching learning cycle in which PSTs plan, enact, analyze, and revise their work. When PSTs approach their teaching as an experiment, the emphasis then becomes the open and public process needed to grow from a shared knowledge for effective teaching (Hiebert et al., 2003). Figure 1 displays the Expansive Learning Cycle embedded within this teaching-learning cycle.
Cultural-Historical Activity Theory is appropriate as a lens in qualitative research, as it provides a framework for understanding and analyzing phenomena in an educational setting. Engeström (1999) confirms that Cultural-Historical Activity Theory is a developmental theory that seeks to explain and influence qualitative changes in human practices over time. Referring to Cultural-Historical Activity Theory, Stillman and Anderson (2011) concur that a collective, mediated, and contradiction-rife context provides an especially useful theoretical lens. With this in mind, this study documents the types of contradictions PSTs face and understand the revisions in instructional practices they are able to make as a result of their contradictions (dilemmas and tensions) teaching mathematics in classrooms situated in Tanzania.

3. Methodology

3.1 Research Questions

1. What are the contradictions (dilemmas and tensions) pre-service teachers face as they plan, enact, reflect, and modify their instruction in mathematics classrooms during early field experiences?

2. What are the instructional revisions pre-service teachers make in response to the contradictions (dilemmas and tensions) they face in mathematics classrooms during early field experiences?

3.2 Data Collection

Audio-taped interviews prior to travel. Interviews of 5 PSTs (randomly selected) captured the concerns and apprehensions they may have about their first whole class teaching experience. The purpose of these data was to record initial dilemmas the PSTs believe they may face while delivering instruction in the Tanzanian classrooms.

Audio-taped class discussions. While in Tanzania, class discussions were audio-taped. The purpose of these data was to record the whole-group discussions the PSTs engaged in while they discussed the contradictions and possible solutions.
Audio-taped interviews following travel. A focus group of the 5 PSTs were interviewed for approximately 1 hour. The purpose of this focus group interview was to provide the PSTs an opportunity to record the actual dilemmas the PSTs faced while delivering instruction in the Tanzanian classrooms. In addition PSTs shared the revisions they made as a result of these dilemmas.

Blog posts. PSTs post on the Study Abroad: Tanzania blog site prior to, during, and post travel to Tanzania. Prompts were provided to the PSTs, although they were encouraged to post at any time and on any relevant topic. Prior to travel each PST posted 1 time, during travel a minimum of 4 times, and post travel 1 time. Blog posts often revealed PSTs dilemmas or tensions and were coded accordingly.

Lesson plans. While in Tanzania, PSTs prepared lesson plans for each of the mathematics lesson they were responsible for teaching. Lesson plans often reflected changes in instructional practices as a result of debriefing sessions, planning, and reflections from previous lessons.

Observations/Field Notes. I observed and took field notes while the PSTs taught mathematics lessons. Observations and field notes took place 2-3 times for each PST. Participants also responded to reflection questions posed during debriefing sessions subsequent to the enactment of their lessons. These sessions were audio-taped.

Reflection papers: PSTs responded to the prompt, “What Do I Know Now That I Didn’t Know Before?” at the conclusion of their time in Tanzania. Some contradictions and subsequent revisions surfaced in these responses.

3.4 Data Analysis

Data were organized and analyzed beginning with the audio data transcriptions and written artifacts and to seek common themes as they begin to emerge. The utilization of an inductive approach to analysis was necessary. As explained by Patton (1990), this approach means that the themes and categories develop from the data instead of predetermined categories prior to data collection and analysis.

Patton (1990) describes the analysis of interview data as the process of seeking patterns, which requires making carefully guided decisions about what is significant and meaningful in the data. Hence, the analysis of these data focuses on the qualitative characteristics of the PSTs’ dilemmas and resolutions. Once categories began to come to light, a constant comparative method of analysis was utilized to compare data bits to other data sources, and other interview statements. Patterns and relationships were described and documented. Maykut and Morehouse (1994) recommend that in qualitative data analysis it is necessary for the researcher to identify patterns within those words and to present those patterns for while at the same time staying true to the intentions of the participants. According to Glaser and Straus (1967) this type of analysis can be used with social units of any size. Qualitative studies such as this one seek to understand, describe, and explain social process from the perspective of study participants.
Rudestam and Newton (2001) refer to trustworthiness as the internal and external validity, reliability, and objectivity of a study. Reliability denotes the ability to replicate the study under similar conditions (Rudestam & Newton, 2001). Measures to ensure internal validity include triangulating the data, peer debriefing, and clarifying tentative findings (Creswell, 2003; Rudestam & Newton, 2001). To address trustworthiness, multiple sources of data was collected for analysis purposes. To ensure reliability, consistency of coding was maintained, and there were external audits of the coding. Tentative conclusions were clarified and verified by an outside reviewer.

4. Results and Discussion

A number of common dilemmas and contradictions surfaced in the analysis of the data. The PSTs remarked that the students often did not understand what they PSTs were trying to teach due to language barriers or cultural barriers. PSTs also recognized that the students did not understand the instruction as result of under-developed conceptual understanding. The PSTs also recognized that they often over planned or under planned the lesson (pacing issues). Additional dilemmas and contradictions the PSTs faced included uncertainty as to the appropriate amount of re-teaching or review of previous taught material. Finally, the PSTs faced dilemmas and contradictions regarding classroom management, and when to allow the students to “explore” or provide “direct instruction”.

The instructional decisions the PSTs were able to implement varied depending on the level they were teaching (primary or secondary), their own confidence, and experiences. For example, the PSTs often simplified word choice, used gestures, drew pictures, asked other students in the class to explain and used code-switching. When the PSTs realized that the context was unfamiliar to the students, they were able to select a different context, which was more closely aligned with the Tanzanian culture. Altering the instructional plan to accommodate the students’ struggles included “re teaching” the concept, decreasing the cognitive demand, and working the problem for the students. Some PSTs at times were able to “step back” and provide cognitive support. Overall, PSTs struggled with pacing issues and classroom management. To alleviate management issues, the PSTs would regroup the students, rewarded students that were demonstrating appropriate classroom behavior, and used “camp counselor” management techniques. PSTs often relied on “direct instruction” approaches in order to more easily manage the class, and they often believed the students responded better to this approach.

5. Conclusions and Recommendations

Often, our PSTs believe that teaching is merely the delivery of instruction. They need to understand there are additional facets of the teaching experience that must be considered. While PSTs understand and we convey the importance of the teaching learning cycle to them, PSTs
often lack real current examples in which they have been faced with actual dilemmas or obstacles and how these have been resolved. Understanding how other PSTs negotiated the challenges of teaching mathematics can also relieve much of the apprehension they report prior to teaching assisting and student teaching. This work however provokes questions such as, why is it that while most PSTs recognize the need to alter their instructional plan to accommodate their students’ struggles, some will “reteach” the concept, some decrease the cognitive demand, while others decide to work the problems for the students? Even though the PSTs are able to shift their instruction, they do not necessarily always consider these shifts when planning their subsequent lessons? Finally, how do we make these dilemmas and contractions more explicit in our work with PSTs, and then make them more aware of this cycle of planning, teaching, reflecting and revision?

References


