

CHAPTER VII

INTERPRETATIONS OF DATA AND IDENTIFICATION OF THEMES

In case study research there is a simultaneous review of field notes and artifacts throughout the study (Merriam, 1998). This give-and-take process allows the researcher to constantly reexamine and refine the research questions throughout the study – ensuring that initial hypotheses guide one to seek truth. In this examination of the reteaching of mathematics, this process was always at the forefront. Each of the five locations provided a rich, descriptive environment in which to observe reteaching at all levels. The beauty in this process is that it created five unique emerging theories regarding reteaching because each location had its own story. Thus, bringing those theories together was initially a difficult and daunting task.

Rather than disregarding the mountainous data I had collected over those several months I found myself needing to reexamine reteaching from a novel perspective – by experiencing the practice firsthand. Because my certification is at the secondary level, I found myself entering the classroom facing students who were byproducts of the reteaching process at the elementary level. At first, I thought it would be second nature, for both my students (because of my previous study) and me. This was far from the case with many students struggling in the secondary curriculum and finding it difficult to commit to their own educational improvement.

As I faced my own struggles and frustrations with student achievement, I found myself seeking advice from my peers within this secondary school. They shared with me their commitment to reteaching. Each struggled in clearly defining what that meant in

terms of classroom instruction. Every teacher is given a handbook (Lincoln Public Schools, 2003) clearly outlining a commitment to retesting – ensuring that every student has multiple opportunities to demonstrate a level of proficiency in the outlined objective areas. However, there is no mention of reteaching – which resulted in an active dialogue throughout the entire academic year within our department regarding the district’s efforts to close the achievement gap.

This rich dialogue among my colleagues prompted us to review both my research notes and the district’s additional elementary curriculum materials (Lincoln Public Schools, 2006b). It is in the latter where reteaching is more clearly defined. In retrospect, Merriam (1998) clearly provided great wisdom in stating “the real learning can only take place in the doing.” Thus, only by allowing myself to experience reteaching from the three unique perspectives of observer, assistant, and educator did clarity arise within the initial data, identifying three major themes describing the reteaching process. Those three themes are:

- the professional practice;
- the instructional materials and their use; and
- the students' development of their learning strategies.

This chapter will further describe how those themes emerged within each classroom and further extend to the reteaching process.

Theme One: Professional Practice

Professional practice denotes all aspects of instruction by the instructors in their classrooms. This includes their own efficacy regarding the subject matter, their recording and use of data to make decisions, and the instructional strategies they utilize.

The self-efficacy of the five teachers was quite high in terms of the subject matter, with the minor exception of Megan. She declared early that in her preservice preparation mathematics was the one subject area she did not feel as prepared to teach in her initial years of teaching. However, her eagerness to expand her knowledge and confidence about teaching mathematics was what brought her to this study.

I did not explore Megan's educational background – which might have supported the research of Ma (1999) in linking student performance to instructor knowledge. It was actually David's current academic pursuits of a Masters degree and his students' struggles that steered me away from this data since his students seemed to struggle in the same ways as Megan's students.

One might also consider that the years of teaching experience could be a contributing factor in the building self-efficacy. After all, Jennifer and Nancy both had several years of working in the school district and had a strong rapport with their students and colleagues. However, Carrie at School #5 had little experience but demonstrated a high degree of efficacy in her instructional practice. It was in her comments surrounding a year of reacting to negative student performance that prompted her to reexamine her own practice and implementing more preventative interventions. Though efficacy is something acquired over time, in Carrie's case it was something that occurred in one year.

Efficacy is also something that is supported through the interactions with peers and my observations at schools 3, 4, & 5 demonstrated an open, robust communication between educational professionals. This was evident in Jennifer's conversations with other professionals on the playground area, Nancy's conversations with younger teachers near her classroom, and Carrie's conversations with many others including fifth grade teachers, district teachers, foreign visitors, and graduate students. These opportunities to discuss teaching appear to impact learning by providing teachers with more confidence in their abilities. This appeared to have extended to their respective students, too.

Moments at schools 1 & 2 suggested a district-wide approach that at times may hinder teacher efficacy. Both instructors clearly stated that they were disappointed in their own pacing within the curriculum. They felt "behind" other district schools. Perhaps the physical isolation of these two teachers distinguished them from the other three. Was David's disconnect a result of his portable classroom? Was Megan's disconnect a result of her location in the building? Perhaps.

In all five sites, teaching practices suggested that reteaching was more ambiguous than was initially anticipated, but always was initiated through the data captured by individual objective. The district's objective cards (Appendix H) clearly provided guidance in terms of the pacing of instruction and were the uniform resource in the recording of student progress. All five teachers had to exert a considerable amount of effort in maintaining the desired pace – with some openly admitting their shortcomings along the way. However, the objective card serves as the document that identifies whether a student has successfully met a specific objective. Each educator manually circles a "yes" or "no" to indicate whether the student met that objective through the

given chapter test. In those cases where the student received a “no”, s/he was asked to be retaught, relearn, and reassess – as is the case throughout the district. This card is suppose to follow each student as s/he moves on her/his educational journey. However, as the data analysis suggested, there should be some concern about the accuracy of the final data reported on this card and indicates an area of further exploration.

There was a uniform process to identify students throughout the five locations for reteaching. However, there were dramatic differences in the reteaching process. In Megan’s case, she treated the reteaching process as an entire class activity because many of her students did not pass one or more objectives.

David began with a similar approach, but found that EDU was a valuable tool to transition students into smaller groups where he could then move between them – engaging each student along the way in a one-to-one discussion to ensure understanding of the material. His tactics would suggest a strong connection into the third area of emphasis in Brown and Quinn’s (2006) Transactional Strategies Instruction (TSI). This focuses on teacher and group member’s actions and reactions to improve learning, relying heavily on the dialogue between the participants.

Jennifer, Nancy and Carrie never had a moment where they had to reteach the entire class. Thus, it was hard to connect David’s transition into reteaching to those of the Jennifer, Nancy, and Carrie. However, these three not only utilized the same TSI strategies, but also employed the facet focused on utilizing groups. In all three cases, they had their students move to a location to focus on the specific content area. In Jennifer’s case, the students simply moved over to a small workstation off to the side of the room and then began by working with other students with the EDU material. In some cases that

generated discussion among the students – helping each other along the way. In Nancy’s case, her students began at the SMARTboard, then transitioned to a small group table, and then to the computer lab. Again, they worked both individually and as a group. Finally, in Carrie’s case her students had established rules within their peer groups that kept each of them in a consistent rhythm – raising the bar, per se, to keep each other on task.

Further evidence of TSI in the latter three cases is with the focus on strategies that enable the link context to prior knowledge. This connection focuses on the individual learners and the strategies they employ. In the three EDU sites, this was often the personal challenge each student put forth to reach that three or four out of four mark. In Carrie’s case, she actually had students who would mouth the work as they mentally processed the mathematics – suggesting they were utilizing mental strategies to automatize basic mathematics procedures.

The other constant between the five sites was the focus on student motivation. Granted, in two of the locations there were some students whose motivation was low. However, they still were actively participating in the instruction, cycling through the materials to keep engaged. Palinscar and Brown (1984) coined the term “reciprocal teaching” to describe this process of keeping the student engaged in the material in order to improve the performance of lower achieving students. The common theme in their process is that motivation, engagement, and achievement are all linked. Thus, keeping motivation high will keep students engaged. An engaged student will produce higher achievement.

When looking at the five classrooms through this lens, it is clear that Megan struggled with motivation with some of her students. Their assessment scores also indicate that they continually go through a process of reteaching and retesting. Carrie had the opposite extreme, where motivation of all of her students was high. Thus, when centers were started, each student had their designated task.

In the three EDU sites, the online materials at times acted as the catalyst to motivate the students – but did so often in an anonymous fashion. In all cases where students would engage in the material in a manner that focused on the process of working through the four questions to a level of success, their level of success on the reassessment was always high.

In both the EDU and non-EDU sites, this link between motivation, engagement and achievement would support the Flow Theory model of Csikszentmihalyi (1971) because of the perceived rewards at the end of the activity. In Megan's case, the reward was not as highly perceived by some of the students. However, Carrie's case showed the community bond was an attribute of that reward.

Addressing student motivation is an area where secondary educators could learn and improve their own teaching. According to my more recent experiences, there is a growing apathy at the secondary level about performance. This is an attribute within all parties of parents, teachers, and students. According to Pressley, Roehrig, Mohan, Warzon, & Bogaert (2003), motivation is the one force that raises the achievement bar and the experiences of those elementary educators suggest several strategies worthy of further exploration.

Finally, stepping back and examining the teaching profession throughout the district, there is a clear goal to support educators by expanding their peer support group. Currently, each school is working in Professional Learning Communities (or PLCs) in order to create a forum in which open dialogue among teachers can explore lessons, curriculum, research, and assessments. These efforts were initiated several years ago at the secondary level, and seem to be proving quite successful in terms of enhancing student achievement. Further literature suggests PLCs are a valuable tool in improving student performance (DuFour, 2004).

Additionally, the district has asked its teachers to begin to examine their own assessment practices and begin to implement formative assessments. It is unclear whether this initiative within the mathematics curriculum was a result of the recent publications by the NCTM (National Council of Teachers of Mathematics, 2000, 2007a, 2007b, 2007c, 2007d, 2007e; National Council of Teachers of Mathematics. Commission on Teaching Standards for School Mathematics, 1991). This emphasis on formative instruction, however, has focused the district's mathematics PLCs in ways that are both student-centered and geared toward using student progress in guiding instruction.

The most important point to take away from this first theme is that selecting any one of these teachers as a prototypical district 5th grade mathematics teacher would give one a significantly different impression of uniform district practice or reteaching. The notion of district-wide practice of reteaching in this context is a myth.

Theme Two: Instructional Materials

Many different artifacts were used by teachers to help students. Nonetheless, the district objective cards were the only consistent artifacts used by all teachers. These documents helped teachers track students' progress. Though there was little indication that performing four additional problems would lead toward success of a given objective, there did seem to be additional opportunities where professional experience came into play.

However, there were other instructional materials throughout the classrooms that supported student learning. Such as those artifacts placed upon each classroom's walls placing an emphasis on basic terminology and number placement. The use of those materials in each of the five cases was different, however, and some possible limitations to learning emerged. At School #1, for example, the one page handout that had been turned into a poster covering the classification of polygons had limited success (unless students went over to the wall to view the worksheet). Extraneous cognitive load factors caused by the materials used by students may cause disconnects in comprehension of the content.

This study began with the intent of assessing the impact of EDU, a computerized learning practice system, in 5th grade mathematics. The dramatic, drastic differences among the five classrooms studied made it clear that a systematic, quantitative study of the use of EDU would not prove possible. EDU was shown, however, to be a valuable instructional tool. Nancy utilized EDU to open up dialogue between students and between her and individual students. EDU supported an environment in which students competed with one another and against the system itself to learn content. In one case,

EDU was used as a whole-class tool. In the end, EDU served as just another learning material.

Theme Three: Learning Strategies

Ultimately the success of reteaching depended upon the individual learning strategies adopted by students. These, in turn, were shaped by the teachers. For example, teachers used EDU materials to give the student additional practice before retesting. At School #2, David used EDU for whole group instruction. EDU was utilized to facilitate discussion. Thus, those students who would be classified as experts were not only able to perform the prescribed EDU activities quickly, but also to assist those students who were struggling. Even though assessment scores did show that using EDU for reteaching could be beneficial, this might just as easily be attributed to increased help-seeking, possibly catalyzed by EDU.

At Schools #3 and #4, EDU was used only for those students who needed the extra assistance and required reteaching. One might think that this use would have narrowed down the focus to the individual students working alone. Though school #3 might actually best model individualized usage, it was at school #4 where a larger number of students using the system at once displayed the help-seeking trait. In the EDU environment, help-seeking was done within the group of students who were already identified as needing more instruction. Thus, their role always began as that of a learner. Once they built confidence in those mathematical skill areas, they took on an instructor role – helping other students to learn the material.

School #5 best exemplified the use of learning strategies consistently throughout the study. The instructor incorporated extensive student practice into her scope and sequence of instruction. One day a student would be engaged in flash cards and rehearsal games, the next embarking on a peer-tutoring role, and so forth. The transformation of skills and knowledge might better be explained in this procedure of rehearsal to build confidence, self-talk or peer tutoring to share knowledge, and then working with the instructor to display knowledge.