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REFLECTIONS ABOUT QUESTIONING: A CONTINUUM OF DEVELOPMENT

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This paper reports on the development of the Reflections About Questioning Continuum, which was designed to characterize teachers' reflections on video recordings of lessons they taught during a 3-year professional development project.

Keywords: Teacher Education-Inservice/Professional Development, Classroom Discourse

A wealth of literature underscores the value of teacher professional development aimed at enhancing classroom discourse, especially teacher questioning (e.g., Bay-Williams & Karp, 2008). In this paper, we report on a professional development program in which teachers identified questioning as a meaningful lens through which to examine and improve their instructional practice.¹ We focus on the ways in which teachers reflected on their questioning when examining video recordings of their teaching and present a continuum that characterizes the nature of teachers' reflections about their questioning.

Theoretical Perspectives

Our research resonates with the growing body of literature on teacher noticing (e.g., Sherin, Jacobs, & Philipp, 2011) and research documenting the benefits of video as a tool for teachers to examine and interpret their instructional practice (e.g., van Es & Sherin, 2009). We relate our work specifically to the van Es and Sherin (2002) study in which prospective teachers were “learning to notice” (p. 572) by being prompted to attend to noteworthy events in video recordings of their teaching and write essays about what they noticed. The researchers developed a trajectory for analyzing the prospective teachers' essays, which included four levels: (a) prospective teachers described events they observed literally and made judgments about those events; (b) they described and judged aspects of practice as they happened but were somewhat more interpretive of the events they observed, although they did not necessarily provide specific evidence to support their argument; (c) they interpreted classroom situations and related specific events to particular principles of teaching and learning; and (d) they connected their noticing to principles of teaching and learning and provided “pedagogical solutions based on their interpretations” (p. 581). The van Es and Sherin (2002) *Trajectory of Development in Learning to Notice* provided a lens through which we interpreted data in this study.

Context of the Study

The data for this study were collected within the context of a mathematics-science partnership project conducted as a 3-year Master's degree program in which teachers earned a degree in either mathematics or science education. The 22 teachers participating in the program were from a public school district in a mid-sized city in the Midwest. Throughout the program, the project team² collected data from a variety of sources to document changes in teachers' content knowledge and instructional practice. The most robust source of teaching data we collected came from a three-phase *video reflection cycle*. At the beginning of the program, each teacher planned, taught, and video recorded a lesson that became the basis for reflection and

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revision throughout the program. About halfway through the program, teachers reviewed their initial lesson plan, viewed the recorded lesson, and reflected (in writing) on their teaching in light of the coursework, readings, and program activities in which they had subsequently been engaged. They modified the lesson plan, wrote a rationale for the modifications, re-taught and recorded the modified lesson, and reflected on the differences between the two lessons as taught. This process was repeated a third time, at the end of the program.

Analyses of the recorded lessons indicated changes in the teachers' instruction and we have evidence that the video reflection cycle was an effective means of prompting the teachers to reflect critically and meaningfully on their instructional practice (Langrall, Morey, & Mooney, 2012). In this paper, we report on the development of an analytical tool to examine how teachers reflect on their questioning when analyzing video recordings of their teaching and to characterize the nature of the teachers' reflections.

Methods

We identified ten teachers who produced substantive reflections for all three phases of the video reflection cycle. Using a constant comparative approach (Strauss & Corbin, 1998), the first author analyzed each teacher's written artifacts to characterize the nature of the reflections. For the analysis reported in this paper, the teachers' written reflections were parsed into units of data that contained direct or indirect references to questioning. Typically, reflections were comprised of about five units of data. For each unit of data within a reflection, the first author wrote descriptive phrases that characterized the teacher's comments related to questioning. She then examined all phrases (across teachers and reflections), clustered similar phrases, and generated descriptors for each cluster. The phrases describing units of data suggested differences and similarities in the focus of teachers' reflections on their questioning. For example, phrases such as "links questioning to multiple strategies," "links questioning to student explanations," and "links questioning to accessing student thinking" collapsed into the descriptor "utilizes questioning as a pedagogical tool." Three descriptors were generated and ordered as points along a continuum that represented a progression in the depth and level of sophistication of the teachers' reflections. At this point, the second author became involved in the analysis and two end points were developed for the continuum. At one end of the continuum, we created a point to indicate that none of the teachers' reflections during the first phase of the video reflection cycle addressed questioning. At the other end of the continuum, we created a point to accommodate characterization of a teachers' reflection that was more sophisticated than the fourth descriptor and allowed us to avoid the ceiling effect with the continuum.

Reflections About Questioning Continuum

The Reflections About Questioning Continuum (Figure 1) is defined by five anchor points that we believe represent a progression in the development of teachers' reflections. This continuum shares important attributes with the *Trajectory of Development in Learning to Notice* developed by van Es and Sherin (2002). In the discussion that follows, we describe each point on the continuum and relate it, as appropriate, to a respective level on the van Es and Sherin trajectory.

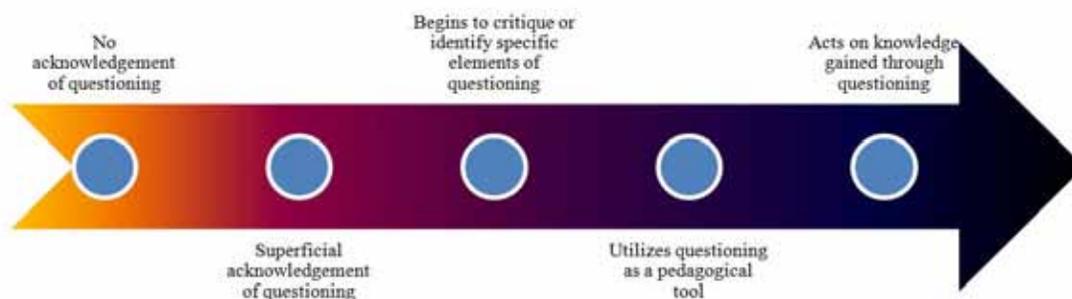


Figure 1: Teacher Reflections about Questioning Continuum

No Acknowledgement of Questioning

The continuum begins with the category “no acknowledgement of questioning.” We included this point on the continuum because none of the teachers in this study reflected on their questioning in the first phase of the video reflection cycle.

Superficial Acknowledgement of Questioning

A reflection was characterized as acknowledging questioning in a superficial manner if it merely indicated that questions were asked or referred simply to the quantity of questions posed. For example, teachers made statements like “I need to ask more questions” or “In this lesson I asked a lot of questions,” but did not go further to critique the nature of their questioning. We consider this characteristic similar to the first level of the van Es and Sherin (2002) trajectory in which teachers provided literal descriptions of the events they noticed and made judgments of the pedagogy they observed.

Begins to Critique or Identify Specific Elements of Questioning

Reflections at this point on the continuum made reference to different types of questions posed or provided a critique of the questioning teachers’ observed in the current or previous video recording. Teachers would often identify the questions they asked as being high level, low level, procedural, conceptual, guiding, or probing, but not provide examples of the types of questions they referred to. When teachers critiqued their questioning, they referred to questions they perceived as important to ask but did not explain *why* it was important to do so. For example, a teacher claimed: “I need to ask more conceptual than procedural questions.” This point on our continuum relates to the second point on the van Es and Sherin (2002) trajectory in the sense that the prospective teachers in their study were becoming more interpretative in their essays, but generally failed to provide specific support for the events they described.

Utilizes Questioning as a Pedagogical Tool

The fourth point on the continuum characterizes reflections that contain evidence of questioning being used as a pedagogical tool. That is, teachers acknowledge the role of their questioning in encouraging discourse in the classroom, requiring students to share multiple strategies, and providing insights into students’ thinking. Furthermore, the connections between these pedagogical practices are clearly stated in teachers’ reflections. The following reflection illustrates the connection between questioning and student thinking: “After watching my first lesson I realized I answered more of my own questions than my students did, which is not a good thing. Students cannot learn if I am doing the thinking, they need to be able to communicate their own ideas.” This point relates to the third level of the van Es and Sherin (2002) trajectory, where

prospective teachers' interpreted classroom events with principles pertaining to teaching and learning.

Acts on Knowledge Gained Through Questioning

The upper bound of the continuum characterizes reflections in which teachers comment on *how* they can use knowledge gained through questioning to inform instruction. Although this point was not fully developed in any of the reflections we analyzed, one teacher did indicate that she could adapt instruction based on what she learned about her students' thinking through questioning. We see this as similar to the fourth level of the van Es and Sherin (2002) trajectory, where prospective teachers provided pedagogical solutions to the instructional challenges they noticed.

Discussion

The Reflections About Questioning Continuum was sufficiently robust to characterize the data collected from our professional development work with teachers. The potential of the continuum to be used more broadly is strengthened by the characteristics it shares with the work of van Es and Sherin (2002) and we believe that other teacher educators could use the continuum to examine teachers' reflections on their questioning practice. The research literature identifies different types of questions that can be posed in the classroom (e.g., Boaler & Brodie, 2004) and this continuum extends such work by providing a way to describe how teachers reflect on the questions they pose and the questioning techniques they employ. Future research needs to examine the connection between teachers' actual practice and reflections on their teaching. The Reflections About Questioning Continuum will be a useful tool in conducting this kind of research.

Endnotes

- ¹ The work reported in this paper was supported by the Illinois Mathematics-Science Partnership Grant No. 4936-72-064-5450-51.
- ² Members of the project team included Cynthia Langrall, Marilyn Morey, Josh Hertel, Elif Safak, and Edward Mooney. Nicole Wessman-Enzinger joined the team for the analysis of teacher reflection data.

References

- Bay-Williams, J. M., & Karp, K. S. (Eds.) (2008). *Growing Professionally: Readings from NCTM publications for grades k-8*. Reston, VA: NCTM.
- Boaler, J., & Brodie, K. (2004). The importance, nature, and impact of teacher questions. In D. E. McDougall & J. A. Ross (Eds.), *Proceedings of the twenty-sixth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 773–782). Toronto: Ontario Institute of Studies in Education/University of Toronto.
- Langrall, C., Morey, M., & Mooney, E. (2012, August). *Institutes for Integrating Content-Knowledge with Classroom-Instruction: Final report*. Unpublished report submitted to Illinois State Board of Education.
- Sherin, M. G., Jacobs, V. R., & Philipp, R. A. (2011). Situating the study of teacher noticing. In M. Sherin, V. Jacobs, & R. Philipp, *Mathematics teacher noticing* (pp. 4–13). New York, NY: Routledge.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.
- van Es, E. A., & Sherin, M. G. (2002). Learning to notice: Scaffolding new teachers' interpretations of classroom interactions. *Journal of Technology and Teacher Education*, *10*(4), 571–596.
- van Es, E. A., & Sherin, M. G. (2010). The influence of video clubs on teacher's thinking and practice. *Journal of Mathematics Teacher Education*, *13*, 155-176.