

# Noticing as a Form of Professional Development in Teaching Mathematics

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As a teacher, I constantly change my practice. I make changes not to correct something but to respond to students and to answer my own questions about teaching mathematics. These changes are a form of professional development because they are often derived from readings or working with other teachers. This article focuses on how John Mason's book *Researching Your Own Practice: The Discipline of Noticing* (2002) can enrich professional development. In particular, I will look at *accounts-of* and *accounts-for* experience, professional development and connections to mathematics.

## Accounts-of and Accounts-for

Mason's (2002) work centres on developing sensitivities for attending to, or noticing, aspects of unexamined and habitual practice, so that choices in moments of teaching practice might be better informed. Mason's research has shown the importance of reflection in developing professional practice by offering a "detailed, structured, systematic" (p 25) way to record and act on reflections.

Mason differentiated between an account-of and an account-for an experience. An account-for an experience includes explanations, judgments and evaluations surrounding an event; an account-of an experience minimizes these aspects. The idea is to write up the account so that others recognize the experience. Mason (2002, 41) wrote that collecting these accounts-of "is one step towards ... identifying a type of situation, tension, issue or interaction which is exemplified in several different incidents or experiences." I decided to try it by writing an account-of a teaching moment.

## Account-of Fractions

While James presented his ideas about dividing fractions, he drew circles on the whiteboard. He

explained his method for dividing one-half by one-quarter, and his classmates asked him questions. James re-explained his method using different words and the same drawings. When he stopped talking, students turned their heads from James and looked at me. James sat down and I elaborated on his strategy. Students then discussed fractions in groups and made drawings of the fractions.

In this account-of a teaching moment, I distilled the experience into a short paragraph. I avoided emotional words and explanations of my thinking, which was difficult because emotions were important in my decisions that day. I also had difficulty identifying the essence of the experience. I had to work at stressing certain aspects, such as what I could remember about the physical situation, and ignoring others, such as my emotions. At first I thought that I was writing about listening to students, but I realized that the essence in this account-of was a moment of taking authority in the classroom. This is different from my original account-for.

## Account-for Fractions

One day I talked about dividing fractions and how simply knowing the procedure is not helpful. It's easy to forget what to do to which fraction. I explained that if you understand it, the procedure is meaningful. I drew an example on the board.

While students were working on a problem, I circulated and chatted. James explained his thinking about the division of fractions to me a couple of times, and I had difficulty understanding him. The students at his table were also confused. We all asked many questions until some students began to lose interest. We were off task, but I thought that the exploration was important.

I asked James to record his thinking for me so that I could consider it some more. I puzzled over his ideas and fraction circles until next class and then

asked him for more clarification. When James presented his ideas to the class, his classmates had lots of questions. Students were getting annoyed because the method made no sense to them. Although James was good at explanations and answering questions, I needed to intervene. I told him that I didn't understand his thinking. James sat down and I presented a similar strategy. The class was focused and silent as I spoke and wrote. I was nervous about adding to the confusion, but I could almost hear that audible aha from students. They began to excitedly talk in groups. I hoped that meant that they were sharing their understanding and not getting bored or confused.

A few days later a student mentioned that she had never understood the division of fractions until that class. I wondered how those teaching moments came about. A lot had led up to that moment, including positive and negative feelings. I'm not sure that the moment would have been as meaningful if the students hadn't struggled to understand a classmate's unfamiliar idea, if there hadn't been time to think and discuss, if they hadn't been emotionally involved or if they hadn't already spent time listening to each other's ideas.

In this account-for, I skipped ahead of simply describing the incident to explaining my actions and trying to draw a lesson out of the experience. If I shared this account-for with others, it might be difficult for them to support me in my re-examination of the experience because I have already explained it and there are no alternatives to explore. Sharing accounts-of (not accounts-for, though, the line between the two is unclear) experiences might be "used explicitly to foster and sustain professional development in others" (Mason 2002, 139).

## Professional Development

Although Mason (2002) mainly focused on how to use noticing for one's own practice, he also wrote about how to use accounts-of to support professional development in others.

A good way to expose people to alternative practices without pressuring them to suddenly adopt one and to act differently is to arrange that one person gives a brief-but-vivid account of some problematic situation, and then others recount situations which they think have some similarities. In the process, different practices will be revealed, but in a non-threatening manner... It is a matter of offering a brief-but-vivid account without the intention of "offering a solution." (p 146)

Following this suggestion, preservice and inservice teachers could write accounts-of their teaching and share them with others, but they must be open to this sort of inquiry and look to change their own practice. Developing trusting and collegial relationships would also be important, though, Mason did not write about this explicitly. Assuming that these conditions are met—which is no small feat—this could be a fruitful way of interacting with teachers. Blending teachers' practical concerns with professional development is possible. These concerns might also be used as a basis for research, whereby theory and practice overlaps. This research might be done by teachers from the inside of practice or by researchers in conjunction with teachers from the outside of practice.

## Connections to Mathematics

The discipline of noticing and Mason's previous work *Thinking Mathematically* (Mason, Burton and Stacey 1985) are parallel. This helps me to better understand how professional development of teaching in general is connected to teaching and learning mathematics.

The acts of stressing and ignoring are part of both mathematical thinking and professional development through the discipline of noticing. When thinking mathematically, I often stress one part of the question while ignoring other parts; for example, looking at a geometric shape and stressing the global characteristics (it looks like a diamond), while ignoring the specific characteristics, such as the angle measures. What I stress and what I ignore can be described as habitual and depends on the situation's context. By stressing and ignoring, I can first specialize and then generalize; both are essential features of mathematical thinking (Mason, Burton and Stacey 1985). The discipline of noticing calls me to attend to what is stressed and ignored in my own mathematical work as well as in my teaching practice. In addition, I am invited to stress the essence and ignore the emotions in writing accounts-of experience. Stressing and ignoring are mathematical ways of examining teaching practice.

Accounts-of experiences are described as "brief-but-vivid" (Mason 2002, 47). A problem of teaching practice is distilled into a few sentences. In this discipline of noticing, a number of these accounts are examined for relationships and inconsistencies. This is similar to the work of mathematicians, which might be characterized as compressing information, and of teachers, which can be thought of as unpacking this condensed knowledge (Ball and Bass 2003). Through

noticing as a form of professional development, teachers condense experiences and then reconceptualize their accounts to transform practice.

## Questions and Issues

This article explains how to consciously notice. Practices can be transformed by attending to experiences, recording them systematically, questioning the accounts and then acting deliberately. Though Mason's description of the discipline of noticing resonates with my own process of reflecting, I also wonder about the power of accounts-for in this discipline. I have used accounts-for in my writing, talking and thinking with meaningful results. Though I resist the focus on the accounts-of (as opposed to the accounts-for), part of this resistance comes from the difficulty and work involved in writing a compelling account-of an experience. Writing and using both accounts-for and accounts-of have been fruitful ways to engage in professional development in my teaching of mathematics.

## References

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