

Mathematics teacher educator noticing: A methodology for researching my own learning

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I present here my interpretation of Mason's four interconnected actions within the Discipline of Noticing as a methodological framework for my research, that is, what I notice as a Mathematics Teacher Educator working with a group of teachers. My research concerns how and what I am learning in becoming a mathematics teacher educator. As a method of research, I am using the Discipline of Noticing as a way of developing my expertise. I explore what constitutes data in such a study and how working with this data, in a way guided by the methodological framework, supports my learning as a mathematics teacher educator.

Keywords: Discipline of Noticing; mathematics teacher educator; methodology; professional learning

Learning as a mathematics teacher educator

Within the field of mathematics education there is a distinction made between what is termed the education of mathematics teacher educators, where the focus is on teacher educators learning through formal courses, and the mathematics teacher educator as learner, where the emphasis is on "teacher educators' autonomous efforts to learn, in particular, through reflection and research on their practice." (Krainer, Chapman & Zaslavsky, 2014, p.432). My study aligns with the second of these terms.

It is research through reflecting on developing as a mathematics teacher educator where an insider approach is often taken. According to Jaworski (2008), "teacher educators as researchers take mainly an outsider position in reporting their research; only a few reflect the insider position of teacher educator learning and its impact on their practice" (p.7). In other words, the majority of reports from mathematics teacher educator research presents the outcomes as sources of learning for the reader rather than the researcher.

My research concerns what and how I am learning in becoming a mathematics teacher educator, having made the transition from secondary school teacher of mathematics to working at a university as a mathematics teacher educator. I am currently working with a group of in-service secondary school teachers in the UK who are developing the mathematical reasoning of students in their mathematics classrooms. My research problem, which lies within the domain of mathematics teacher educator learning, can be framed as becoming a mathematics teacher educator via self-reflection on my own professional trajectory through in-service activity with practising teachers. The foci for my study are my actions, choices and the structure of my attention in that I am working with what I notice during conversations with these teachers both as a group and individually based on their classroom experiences.

Noticing-Marking-Recording

To notice is to make a distinction, to bring something to the fore from the background. When we notice something, it is brought to our attention. Attention to noticing turns studies focused on other people into studies which “learn about other people and situations through learning about oneself” (Mason, 2002, p.183). In a study based on noticing, I am not solely interested in what I have done, or what I am doing but also what is possible to do in the future and how these possibilities might be realised.

Mason (2002) distinguishes between *noticing* and *marking* and suggests that we must become disciplined in our noticing if we are to improve our professional practice. If, having been prompted, we are able to recall an incident shortly after it has occurred then we have *noticed* the incident. If we can initiate mention of the incident, this indicates further significance and that the incident has been *marked*. Remarking to others on what has been noticed demonstrates the salience of the moment or event, and makes it available for further evaluation. To clarify the distinction between the terms noticing and marking, I have found it useful to consider an everyday experience which I share here:

I regularly use a multi-story carpark and park my car on a variety of floors and in a variety of spaces. In the past, I have, on occasion, returned to the carpark not knowing where my car is. On these occasions, I have tried to take myself back to my arrival into the carpark and recall anything that I might have noticed, for instance, whether I walked up the stairs or down the stairs to exit the carpark or whether I parked next to a pillar or in a corner. If I am able to recall something I have noticed this will often be enough to locate the car. On occasion, I have been unable to recall anything I might have noticed (or I did not notice anything) and subsequently had to search the carpark for my car. Having had these frustrating experiences, what happens now is I not only notice my route from where I have parked my car to the exit but I mark it in that I am acting intentionally, for example, counting the floors and making a ‘mental note’.

It follows that if somebody else gives an account of an event that you recognise from a description then you too noticed the event. In this way noticing is subconscious. If you are able to initiate a description of an event that you noticed for yourself then it has been marked. Noticing, marking and recording have differing energies associated with them (Mason, 2015) and these different energies support differing potential for action. If an incident that is noticed is salient to the observer in that it gets marked, then there may be sufficient associated energy to lead to the recording of that incident (for example in the form of a written note).

In the context of my research, I am working at what I intentionally notice during the transcription of the audio recorded discussions with the teachers I am working with. What I notice and simultaneously mark seems to be triggered by something in me, a change in the status quo, a release of energy. This change may manifest itself as an uncomfortable feeling, or a sense of surprise or confusion and signifies when a moment has salience. When this happens during the process of transcribing the discussions I have had with the teachers I am working with, I have recorded these moments (see underlined moments in table 1) so that they become available for further evaluation and analysis.

What constitutes data?

Principal components of research of course include data collection and analysis. The data collected in the practice of inner research (that is, research from the inside) consists of fragments of experience (Mason, 1988) where experience lies within the domain of Phenomenology (e.g. Merleau-Ponty, 1962).

Within the Discipline of Noticing, Mason talks about data as consisting of moments of noticing which “may be recorded as brief-but-vivid accounts-of incidents which are used to enhance future moments of noticing” (Mason, 2002, p.185). In my study, these accounts or fragments of experience are based on classroom incidents or events that teachers report on in the group and individual conversations with me. Table 1 shows lines from the transcription of one such account given by one of the teachers from the group. The line numbers come from the original transcription and underlined are the parts of the account that stood out to me in the transcription of the account, that is, what I marked during the process of transcribing (and recorded by underlining). These recorded moments have formed the basis of the data for my research up to this point.

| Line | Transcription of account |
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| 15 | they are. <u>It completely split my class massively.</u> Um, the ones who I’m confident will |
| 19 | understanding the structure. <u>On reflection, I think I should have done something</u> |
| 20 | <u>much simpler</u> first I just made these because I’m doing similar triangles with them |
| 34 | two years ago, um, so, I but my maths is ok, <u>I think a lot of my department would</u> |
| 35 | <u>really struggle with opening that, opening themselves up mathematically to that,</u> um, |
| 43 | <u>interesting, it was quite hairy at times,</u> and it took about, that took about five |
| 48 | get it and I’m really cheesed off that I don’t get it and <u>I had to put some emergency</u> |
| 49 | <u>repairs in place</u> um so. That’s me. |

Table 1: Partial transcripts of audio recorded discussion. Underlined recorded moments.

A study which reflects on events begs the question, what is it that constitutes an event? Events are experienced. These experiences are often confused with stories that get told about the events which become elaborated over time. There can be a tendency for the story being told to become the experience itself. For example, there is the story my mother used to tell me of when I hurt myself quite badly at the age of about two. The story which I heard on a number of occasions, includes detail of the visit to hospital. I can bring this event to mind immediately and vividly including where I was sat and what the doctor said. I am convinced, given I was so young during the time of the event, that the image that comes to my mind is based on the story I have been told, this story has become the experience rather than the experience itself. Within the Discipline of Noticing it is acknowledged that there is a complex interplay between a story and an experience and that experience is seen as being broader than language. As Mason (2002) puts it “I can (attempt to) say only a small part of what I experience, but differentiating experience is assisted by language which is social and all encompassing” (p.228). Merleau-Ponty (1962) suggests what is biologically possible is related to our history of experiences and what is experienced is related to our biological constitution.

As an educational researcher, I am concerned with the generation of new knowledge. Furthermore, I must find ways of not only representing the conclusions of my enquiry but representing the path of thinking that has led me to any conclusions that I come to. This is not simply a case of following a set of methodologies but

instead it involves me showing the connections between myself and the subject of my enquiry. The subject of enquiry is what I notice and what I notice is deeply part of me.

Noticing as a methodology

Self-awareness and expertise

Central to Noticing as research is Mason’s notion of an inner witness (2002). In developing an inner witness, we are developing our self-awareness which supports the possibility of acting in-the-moment. The inner witness “watches without participating, without being caught up in the doing” (Mason, 2002, p.19) and acts as a source of advice and comment. The awakening of an inner witness (known also as having self-awareness) is that which makes an expert be expert. According to Mason (1998) “it is possible to develop an inner witness who observes but does not comment, who extends the structure of attention. Such an observer is independent of attention, but a component of awareness” (p.251). Developing an inner witness means developing part of myself that can remain separate to the emotions of the moment so that when an emotional response to what is being said is triggered in me, I am able to remain neutral and act without judgement, opening myself up to act in an expert way based on what I am noticing.

The Discipline of Noticing can be summarised in four interconnected actions. Mason (2002) terms these four actions: *Systematic Reflection*, *Recognising*, *Preparing and Noticing*, and *Validating with Others* (p.95). These four actions are not meant to form a sequence to be followed mechanically but instead offer me a methodological framework on which to base my study. This framework, which informs my methods of data collection and analysis, is the focus of this paper and what follows is some detail on each of the four actions in relation to my research.

Systematic reflection

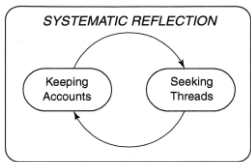
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|  <p>The diagram is titled 'SYSTEMATIC REFLECTION'. It features two ovals: 'Keeping Accounts' on the left and 'Seeking Threads' on the right. A curved arrow points from 'Keeping Accounts' to 'Seeking Threads', and another curved arrow points from 'Seeking Threads' back to 'Keeping Accounts', forming a circular process.</p> | <p>Keeping and using accounts, through noticing, marking, and recording brief-but-vivid moments, and considering what might have been done, in retrospect; looking back over a period to find common threads, themes, and issues.</p> |
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Table 2: Image and description of *systematic reflection* from Mason, 2002, p.95

Having transcribed a number of the discussions from the group of teachers and discussions with individual teachers, I plan to continue working at creating data that consists of my markings. As this data will have been created over a period of a year, the extra layer of *systematic reflection* consists of me looking back over this period to find common threads, themes, and issues within the data and to track whether what I notice is changing in any way. It should be possible for me to track, not only what I am noticing and marking during the process of transcription, but also begin to record what I notice in the moment through future discussions. It is important for me to capture when there is a change and if this has been through the development of my sensitivities to notice. Themes within my markings will emerge as I begin with my own observations, from and through which categories and theories might gradually emerge. As themes and threads emerge I will search deliberately for similarities and differences. Once these categories have emerged, I will analyse for fit and non-fit –

for me this means setting myself to look for features which contradict or complexify what has so far been noticed.

Recognising

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| | <p>Being alert to the actions of others, as distinct from the effects of those actions, helps extend the range of acts and tactics upon which to draw; picking up ideas of ways to act from other people and from writing and thinking, making a note of these. Identifying and labelling typical situations can help recognition occur in the future.</p> |
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Table 3: Image and description of *recognising* from Mason, 2002, p.95

Through identifying and labelling typical situations by looking across data from the first year of discussions, the aim is to help further recognition occur in the moment of future discussions with teachers. Labelling a salient moment, for example, as a “slide” (Helliwell, 2017, p.4) from an account-of to an account-for has resulted in me being more sensitised to when a subsequent slide occurs. This in turn has signalled me to respond accordingly. In the moment of these discussions I will aim to record when this recognition may have occurred and if this is not possible then as quickly afterwards as is possible. It is important that I continue to seek multiple perspectives (Helliwell, 2017) on what I notice by seeking resonance with other mathematics teacher educators.

Preparing and Noticing

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| | <p>Developing sensitivities through vividly imagining oneself carrying out chosen acts in order to make it more likely that they will come to mind in the moment in the future; setting oneself to notice specific events or acts.</p> |
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Table 4: Image and description of *preparing and noticing* from Mason, 2002, p.95

Having identified themes and issues from data collected across the year I will be working to develop my sensitivities by vividly imagining myself carrying out chosen acts in order to make it more likely that they will come to mind in the moment. This is likely to be most effective in preparation of the discussions that I will be facilitating and audio-recording. Data collection after this will be the beginning of a different phase of analysis where revelations that have arisen from the first year are vividly imagined prior to each discussion in the second year. What I notice and react to in the moment will then become the object of study as well as what gets noticed in the process of transcription. In the case of, for example, a slide, imagining how I might like to respond given a slide is noticed will make a response more likely to occur.

Validating with others

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| | <p>Selecting and honing descriptions which others instantly recognise; refining task-exercises which highlights fruitful issues or sensitivities.</p> |
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Table 5: Image and description of *validating with others* from Mason, 2002, p.95

Within the Discipline of Noticing; validation is something that happens in and through my own experience. Validation is therefore situated and specific to the time and place. The generality of my research findings lies “in whether [my] future action is informed, and whether readers [of my research] are alerted to something they can test out in their own experience” (Mason, 2002, p.186). Thus, my focus is on myself, but I look for evidence that teachers’ sensitivity to notice is enhanced. But changes in sensitivity to notice and act, and development of informed practice, are not usefully or consistently evaluated by study, they are evaluated consistently through the “self-same action of checking out with others that they too notice something and are informed to act in the future” (Mason, 2002, p.201). Furthermore, validation lies in the development of ways of working which enable others to take up and try something similar for themselves, rather than in external measures of their improved performance, i.e. through my development of task-exercises. Validation also occurs through seeking resonance with others.

Ultimately the purpose of my study is to develop my own ability to notice and act differently in the future through developing my sensitivities in the moment. A further purpose is to develop sensitivities to notice in others. This will most likely come about through working on how I frame and enact both group and individual discussions and through devising specific task-exercises. I can imagine, for example, suggesting that a teacher pays special attention to what they notice during the lesson – even making a brief note in a quiet moment where possible. The detail of these task-exercises will only become fully apparent through the collection and analysis of my own data alongside my reflection on the process of my research and learning.

References

- Helliwell, T. (2017). Salient moments: The potential for using multiple perspectives in mathematics teacher educator learning. *BSRLM Proceedings*, 37(1). Retrieved from: <http://www.bsrlm.org.uk/wp-content/uploads/2017/06/BSRLM-CP-37-1-07.pdf>
- Jaworski, B. (2008). Mathematics teacher educator learning and development. In B. Jaworski, & T. Wood (Eds.), *The international handbook of mathematics teacher education Vol. 4: The Mathematics teacher educator as a developing professional*. Rotterdam: Sense Publishers.
- Krainer, K., Chapman, O., & Zaslavsky, O. (2014). Mathematics teacher educator as learner. In S. Lerman (Ed.), *Encyclopedia of mathematics education* (pp.431-434). Dordrecht: Springer.
- Mason, J. (1988). Fragments: The implications for teachers, learners and media users/researchers of personal construal and fragmentary recollection of aural and visual messages. *Instructional Science*, 17, 195-218.
- Mason, J. (1998). Researching from the inside in mathematics education. In A. Sierspiska, & J. Kilpatrick (Eds.), *Mathematics education as a research domain: A search for identity* (pp.357-377). Dordrecht: Springer.
- Mason, J. (2002). *Researching your own practice: The discipline of noticing*. London: Routledge.
- Mason, J. (2015). Responding in-the-moment: Learning to prepare for the unexpected *Research in Mathematics Education*, 17(2), 110-127.
- Merleau-Ponty, M. (1962). *Phenomenology of perception*. Translated by Colin Smith. New York: Humanities Press