

SUBJECTIVITY AND CONFIDENCE IN MATHEMATICS EDUCATION

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Relationships to learning and teaching are distinctly formatted when it is the learning of mathematics that is under consideration. In this site there is a sharp divide between those who derive pleasure and those who do not form productive relationships to learning. Further, despite decades of innovation and change the effects of learning mathematics seem to be repeated and remain recognisable across generations. National and local initiatives may re-format surface features of mathematics teaching however, research in this area continues to report repeated effects and unchanging results. As mathematics education researchers, our understandings of these stagnations and repetitions are dependant on the framing we use to make sense of learners' experiences and relationships in this site. From this perspective, mathematics learning and teaching provides a valuable site for uncovering paradigms that are both unproductive and discouraging for education research with concerns for inclusion and social justice. My focus is the professional learning of teachers who will be responsible for teaching mathematics. My starting point is their relationships with teaching and learning mathematics and my concern is with issues of inclusion for their learning and practice.

This paper is intended to exemplify of how models of teachers' learning can produce limited and alienating accounts of teachers and their practices; to outline how 'subjectivity' can open these up and to indicate what sorts of questions would give a productive direction for future work in the social world of mathematics teacher education.

I have found socio-cultural theories and poststructuralist framings of identity can open up accounts of people's developing relationships to the experience of learning and their learning trajectories. In common is a notion of subjectivity, a discourse-aware frame which presents the human subject as produced and positioned in and through language, as an effect of language (Lacan 1962). Subjectivity is a process through which individuals, are constituted and through which, in implicit ways, they constitute themselves - a subject both as agent and 'subjected to'. This frame does not purports to produce the true version of events, rather it opens up alternative accounts, in particular, accounts discouraged by more rationalist modellings.

The formation of subjectivity produces a subject existing as a set of multiple and contradictory positionings. These multiplicities are not seen as contributing to a resulting coherent and rational individual. (Henriques et al 1984 p. 204).

I offer an analytical example from mathematics teacher development that shows how identity is not fixed but rearranged in relation to others and subject knowledge and captures ambiguities caught up in the process of identity formation,

The discursive field of teacher development is textual rich. Professional discourse around learners, classroom and schools, wider public understandings, media reporting of policy and research findings circulate to carve up mathematics teaching creating categories and truths about teachers and teaching ('effective' teacher, 'confident' learner, teaching strategies 'that work'). As this plays out in today's UK context, primary mathematics teaching is 'produced' as a persistent problem where a major difficulty has been located in the subject knowledge of those who are trained to teach mathematics in primary schools (Hardy under review). This is symptomised by entry audits and exit numeracy tests for training students. Such regulative tools classify student teachers and their knowledge of mathematics as insufficient. Further, primary teachers do not have the right sort of knowledge. For effective teaching the required mathematics knowledge has been described as 'secure' (McNamara et al 2004). This generates the possibility of teachers' knowledge as insecure, and evokes a teacher who her/himself is insecure. By association their teaching and planning also becomes suspect. Along similar lines, offering professional resources to be used to 'audit your knowledge in order to gain confidence and competence in mathematics subject knowledge' (DCS 2007) produces the possibility that teachers need to be more confident in their subject knowledge.

Reference to internal states (confidence, insecurity) implicates not only teachers' knowledge and competence but also establishes a more personalised failing.

Essentialising forms ... generate internal categories of personhood that are unchanging and timeless, that come to be inescapable, and hence that bear a determining influence of sorts on the person in question... one effect of a strong (essentialising) discourse is the production of a fixed fictionalised identity. Why does this matter? This discourse determines in so much as that person comes to understand themselves and how they understand others. (Parker, 2004 p. 139)

References (often hardly noticed) within a discourse to deep internal states activates not only what we know of teaching and its problems but also produces possible positions and identities for teachers to take. Teachers also take on such positions to understand themselves and their teaching, e.g. when teachers describe a 'discomfort' with their own level of mathematics content knowledge.

PERFORMING CONFIDENCE, PERFORMING CONSISTENCY

Subjectivity also relates to theorisations of 'how agency as constantly subverted to desire, and the extent to which we behave and experience ourselves in ways which are often contradictory' (Henriques et al. op cit p. 205); portraying a fundamental irrationality. To illustrate how this can play out there follows an example that draws on a project with students attending a mathematics module as start of a primary education course. The course has been described as an opportunity to learn to learn mathematics, to develop 'secure' mathematics knowledge, to re-negotiate relationships with learning mathematics and teaching mathematics. Here they do learn some mathematics at their own level. When identifying valid approaches for

researching identity formation in this site, I sought tactics that challenge essentialising discourses and open up fixed conceptions that have emerged during this module. For this purpose the device of 'confidence' and confident learners of mathematics has potency. This derives from its hard to define nature and its common use as faintly noticed modifier. Confidence is produced as a category, an essential characteristic; a confident learner, good at maths. In individual and group interviews the students were asked to complete unfinished statements about learning mathematics and what they thought confident learners were like. My students had no difficulty identifying who is confident - their fellow students that they thought were confident in maths (Hardy 2007). Key themes recurred in their responses; 'speaking out; willing to offer answers; explaining; asking for help; taking risks; having a go'. Students were identifying forms of participation to indicate confidence in their peers. Their descriptions of their experiences also emphasised that contributing in a class or group session is to open oneself up to be judged by peers and by teachers. It seems that the performance stands in for the learner, that is the performance is used as a basis for judgement and so produces the learner as confident or not. The students are aware that to be attributed with confidence you must act particular ways. Visible participation and performance in front of others is necessary; you must speak out, you must offer answers. Valid contributions are fast, slick, and appear to be made with ease. Interestingly, their descriptions referring to themselves have a different tone 'I will have a go at an answer when I know the subject very well; when I'm 99% sure; if I can have a go on my own; if no one is watching if I get it wrong. The students' articulations advise that it is only safe for a learner who is sure and understands to contribute to the group and warn that there will be little time to work on ideas, to clarify and evaluate.

In applying the framing of 'subjectivity' the students' articulations can be scrutinised for repetition and inconsistencies. The attribution of confidence as an inner characteristic of personhood seemed to follow from predominately performance-based elements. Confidence is performed and a competence is presumed to follow. An ambiguity is revealed between the students' description of conditions where they feel confident to contribute, and their descriptions of the acts of their peers to whom they attribute confidence. Notably only one student suggested that it was possible to be confident and not prepared to speak out.

To open up essentialising constructs such as confident learners to alternative understandings there is a need to interrupt and to question what motivates these identifications. Henriques (p. 204) suggests that psychoanalysis frames agency as constantly subverted to desire as we repeatedly position ourselves within particular discourses and endeavour to maintain a coherent image of ourselves as deciding, choosing subject. For my project I can use this notion to examine some apparent contradictions in students' descriptions and to pose questions such as, 'At whom are the students' articulations and behaviours aimed?' What image of the subject and themselves is it necessary to maintain? I am also prompted to consider how a performative element is able to hold sway in learners' and teachers' descriptions: the

key theme from my example. Rather than reporting 'findings' which in themselves can come to form essentialising truths, my tactic is to produce semi-fictionalised narratives to generate new understandings of the students' articulations of their lived experiences. These 'fictions' are imagined researcher commentaries for learners seeking to complete their image of themselves. Here is one for a pre-service student:

She identifies herself in the performances she perceives as those of a confident learner. This requires participating in sessions in particular ways. In doing so she puts her trust in the tutor's assertion that participating and trying is what matters. An unreliable process. There is no guarantee that this will lead to her attribution as confident by her tutor or peers. In an interview she describes confident learners to include those who know how to start a problem, extend their work and who can say why something works. These are rich descriptions of forms of engaging with maths, richer than some of her peers have given. However they are difficult behaviours to replicate. If she glosses over this and limits her view of maths to be about right or wrong answers, she can sustain a more complete picture of herself as a learner in relation to maths. It is easier to trust the mathematics if it only requires her to get the right answers.

This analytic fiction allows consideration of whose interests are fulfilled by a focus on performative aspects. When confidence and competence can be performed, the learner is offered something to strive to do. Some learners feel discomfort with need performing maths in front of others. This will strengthen a sense that they are and never have been any good at maths, an identification that allows them to sit back and keep quiet. For others the alienation will take other forms. As in Jo Boaler's (1997) study, a learner's desire for understanding and for time to work things out will go unfulfilled. These desires and these learners are marginalised - achieving well enough but still not participating in the right way. As a consequence they do not identify themselves as confident learners of maths and as such are unlikely to map mathematics into their future identities in a positive way.

Those opening up understandings of relations to mathematics and learning need to be aware of how disabling narratives of inconsistency may be. Accounts that locate the responsibility for contradictions within particular individuals will constitute these as failings and disorders of the individual. Recent UK policy in mathematics teacher education has been premised on a perceived lack of confidence and competence for primary teachers in this area. This premise seems to have shifted little to date. From this scrutiny, I would suggest that advice to educators and researchers will need to acknowledge the tangle of confidence and competence that frames understandings of learners' relationships to mathematics. A further tactic to interrupt this stagnation is to ask different questions in radically different terms. As an educator, what might I do that would be in radically different terms as I design courses, as I plan activities? I suggest a start of asking how interactions (and so available relationships) can be configured so that subject knowledge is not presented as an object: to be learnt, refreshed or topped up but rather as knowledge which in itself is something to be challenged and interrogated.. An example of this is offered by Haywood (2007) with his attempt to interrupt in how his pre-service course talks about itself and so the

relationship students will form with it and so their teaching selves. Another question that might open up new possibilities is posed by McNamara and colleagues (op cit Cp 4) “How can students develop a capability for working on their own professional development (in mathematics education) in a way that relates to their personal aspirations of what it is to be a teacher?”

And finally, from an understanding of research itself as culturally constituted, there is a challenge to how researchers read ‘data’ and ‘tell’ what emerges. We need to be mindful that the resources and commentary used in report research in learners’ relation to mathematics and learning can also contribute to disabling narratives.

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