Exploring the interaction between teaching for mastery pedagogy and social justice in the 'lived experience' of mathematics mastery for children in Key Stage 1.

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Teaching for mastery is the government's policy initiative for improving outcomes in mathematics. However, the impact of the teaching for mastery pedagogy on children's experiences of their mathematics classroom from a social justice perspective is rarely attended to. Data was collected as part of a constructivist grounded theory case study of one school. This was formed through contextual interviews with teachers, participant observation of mathematics lessons and focused interviews with children, designed to co-produce data to illuminate children's experiences. The data from one teacher and their class are explored through initial and focused coding, and emerging themes are examined. For the teacher involved, there were many pedagogical dilemmas relating to teaching for mastery and a discourse of ability was apparent through pedagogy and reflection. For children, experiences were expressed in terms of agency and being in control of their own thinking or work.

Keywords: social justice; mastery; constructivist grounded theory; primary

Introduction

This interpretivist research evolved through classroom experience teaching in Key Stage 1 of a primary school in the East Midlands of England, and an interest in pedagogical practices in teaching and learning mathematics. The aim of this paper is to explore the coding of data using constructivist grounded theory methodology (Charmaz, 2014) and how emerging themes were identified for preliminary exploration using social justice as a lens.

Mastery: establishing the context of the classroom experiences

Mathematics mastery in England has been adopted and normalised through political discourse and the move towards professional development for primary mathematics teachers via the National Centre for Excellence in the Teaching of Mathematics (NCETM) and local Maths Hubs. The definition of mathematics mastery in research is inconsistent, while the impact of mastery pedagogy on learning is difficult to measure as many component practices that are attributed to mastery pedagogies have been used by teachers for a number of years (Boylan et al., 2018). Mastery itself is often considered in terms of a set of beliefs about learners' potential and mindset, a type of curriculum, a type of quality of learning and a pedagogy that is informed by East Asian approaches to mastery (Boylan et al., 2018). In trying to understand what is understood by teachers in England in terms of mastery, Simpson and Wang (2023) found that the term is inconsistently defined, but also that there was a danger that almost anything could be claimed as being done in the name of mastery. Therefore, research is needed to understand what happens in the classroom in the

name of 'mastery' in terms of the context of classroom practice in mathematics and the resulting experiences of children. Clarity in this area might reduce the current feeling of frustration with mastery that some teachers experience in their work (Clapham and Vickers, 2018).

Social justice: a lens to interpret classroom experiences

Similarly to definitions of mastery, definitions of social justice are complex, often contested, and lacking in relation to mathematics (Colquitt, 2014). From an interpretivist perspective this could be due to the concept of social justice being dynamic in terms of the social construction of reality and the context and time specific nature of this reality. For the purposes of this research two types of social justice are distinguished. 'Social justice in education' refers to the way social justice is enacted in the classroom (Boylan and Woolsey, 2015) and 'social justice from education' refers to the wider effects of social justice on society, including the way mathematics should challenge social and political issues (Felton-Koestler, 2019). A focus on equity and fairness in terms of social justice is inadequate (Gates and Jorgensen, 2009) and therefore consideration of the relations of power, access and equity that are lived in and through social practice is also required (Bourdieu, 1984). This research focuses on the enactment of teaching for mastery pedagogy in the classroom and the children's lived experiences of these social practices in terms of social justice, therefore, situating the research within the 'social justice in education' approach.

Methodology

The research question to be addressed is: How is social justice reflected in the lived experience of the enactment of the mathematics mastery policy in the mathematics classroom for children in Key Stage 1 in England? The design of this research to answer this question was heavily influenced by restrictions in primary schools during the Covid-19 pandemic. During 2021, when ethics approval was sought from the University of Birmingham Ethics Committee, the Covid restrictions in terms of access to schools and moving around classrooms in school was dynamic and unpredictable. Therefore, to ensure access to data in a longitudinal study, the decision was made to construct a case-study of the school in the East Midlands of England, which I was working in at the time. This approach is appropriate as it enables exploration of a situation where the boundaries between the enactment of the policy of mathematics mastery and the actual lived experience can be examined in depth (Yin, 2018), enabling a thick description through the exploration of multiple perspectives (Geertz, 1975). However, close consideration was also needed in terms of insider researcher issues, as all the children who were eligible to participate in the research had been taught by me in some capacity when they were in Early Years Foundation Stage.

Constructivist Grounded Theory was used as a methodological approach for designing and conducting the research as this approach enables the construction of findings from the data, not just their emergence (Charmaz, 2014). The iterative approach of simultaneously collecting and analysing the data, focusing on actions and processes rather than themes and structure, and constantly comparing, enables a relational understanding of the data to be developed (Jarvis, 2018). This enables critical inquiry to emerge which encourages reflexive self-gazing in terms of the research process and the empirical world (Charmaz, 2017).

Keeping children central to the research methodology was essential when considering the development of this research as children are the experts in their own

experience of mathematics withing the classroom space. Phase 1 of the research was a context establishing round of semi-structured interviews with teachers working in Key Stage 1 of the school during the 2021-2022 academic year, and teachers who had worked in the Key Stage the previous year. Phase 2 of the research was longitudinal, spanning the whole of the 2021-2022 academic year. Four participant observation mathematics lessons were conducted for each of four classes (two Year 1 and two Year 2 classes). Following each participant observation lesson, a brief teacher reflection interview was audio recorded. During the same afternoon, interviews with children from the lesson were conducted and audio recorded. The first round of children's interviews involved paired interviews where the children talked about their mathematics lesson. Photographs of the lesson were taken by the researcher and shown to the children to remind them of the lesson during the interview. The second round of interviews were also paired interviews, but a selection of mathematics manipulatives, identified by the teachers as important, were used as an impetus for discussion. The final two rounds of children's interviews involved individual children constructing their own representation of a school maths lesson using Playmobil to focus for discussion (see the work of Gripton, 2020). By utilising different techniques for data collection with children, both in paired and individual situations, the data could be co-constructed in a way that allowed multiple voices to be heard.

This discussion focuses on the data collected from one Year 2 class (Class 3) and their teacher (Teacher F) during the initial teacher interview, first two participant observation lessons, teacher reflection interview following those lessons and the subsequent first two sets of children's interviews from that class. The Head Teacher interview was also included in this analysis.

Findings

One of the initial difficulties in starting to code the interview transcripts and researcher fieldnotes was avoiding being descriptive and analysing the relationships between the constructs. Charmaz (2014) suggests achieving this by using words to describe the actions rather than a categorical description. Adopting this approach on a line-by-line basis through the transcripts, enabled a close familiarity with the data to be established. Following this initial coding phase, 161 codes were identified, including: having pedagogical dilemmas, managing support, being high ability, belonging to a group, believing you can do it, facilitating change, holding children back, being comfortable, working with friends, having agency or control, and encouraging talk. A need for some more focused coding was clear, as this was unsustainable for coding the whole data set. Therefore, comparison of codes and a broader coding of themes was initiated, constituting a more focused coding phase (Charmaz, 2014). Some of these emerging focused codes will now be discussed.

Having status in the classroom

There was a clear sense that status in the classroom was created through the pedagogical approaches of Teacher F. Although Teacher F talked about 'whole class' teaching, she did not conceptualise this as mixed ability teaching in the way the Head Teacher did. At the start of the academic year the tables were required by the school to be in rows, facing the front, due to Covid policy in the school. However, when this changed later in the year the layout remained the same. The children in Class 3 were specifically arranged so that those that were identified by Teacher F as 'low ability' were sat at the front, so they were easy for her to 'get to' when teaching. Also, during

independent fluency activities Teacher F would engage predominantly with the children in that row. Mid-way during Observation 1, a group of children were also called to the carpet to work on an alternative problem to the rest of the class. The children all knew who were in that group as they had worked together before. Therefore, grouping was an everyday means of organising the classroom despite the overall philosophy of whole class teaching and the fact that Teacher F identified in their interview that "Being in the bottom group isn't good for anyone." This commitment to whole class teaching but the perpetuation of an 'ability' discourse with fixed expectations would seem to show that issues discussed in research ten years ago are still in play in the classroom today (see Marks, 2013).

Within this discourse of ability that was established through Teacher F's general classroom organisation and pedagogy, the experience of the children was interesting to explore. Whilst the teacher felt they had a whole class pedagogical approach, the children were tuned into the fixed nature of grouping within the class. The following interview transcript excerpt shows how two children talked about why some children had different mathematical problems to attempt:

> Researcher: You didn't do that one, so why do you think you didn't do that one? Why did some people do that one?
>
> Child 3N: It was only the group that I used to be with. Because when they were in purple, I was in purple.
>
> Researcher: Okay, so…
>
> Child 3C: Now I'm in gold and my group is in white, I'm not in the group.
>
> Researcher: Right, okay, so what does that mean then? Do you know why they did that and you didn't?
>
> Child 3C: I think it was because they are on the last level of reading books.

There is a sense of belonging to a group that the children have linked with being 'good enough' to participate in a particular learning activity. The fact that this grouping is related to their reading, shows the level of importance they attach to the membership of a group in terms of being able to achieve, even when they are learning in a different core area. Despite the aim of mastery whole class teaching being equal access to the curriculum, this attempt at equal distribution does not ensure social justice (Gates and Jorgensen, 2009). Gripton (2020) found that children's experiences of ability in classrooms differed in terms of the way they internalized and made meaning of the same classroom contexts. This is an area that will need deeper analysis. The critical question of whether grouping is used flexibly to meet children's needs or whether it is linked to 'fixed-ability' thinking is crucial here.

Tensions arising between equity and equality

A contradiction between equity and equality was clear in the contextual interviews of Teacher F and the Head Teacher.

> "…it's more about equity than equality in a situation and some children need more support, and in order to be to meet that need to meet everyone's needs equally that needs to be equity, you know in that children have higher need, need to have more support in order to attain the same as someone who is already have a higher ability or making significant progress." (Head Teacher)
>
> "…the teacher's time is given equally to all children over time so that so that all children are getting that equal input from the most skilled professional in the room." (Head Teacher)

These quotes from the Head Teacher transcripts show how a dilemma between equity and equality is perpetuated through the expectations of the school leadership and cause tension within classroom practice. Teacher F also demonstrated this:

> "…to have more, is just, if that makes sense. For them to have additional support is it just thing, because then it puts them on the equal playing field." (Teacher F)

> "…if we're being just, you know, I'm pulling all the children to their highest potential, then they would get just as much time…" (Teacher F)

Deeper analysis of this, and the rest of the data, will be approached by asking critical questions, such as: Why do teachers give support that way? Why is there a choice to be made? Is their talk of 'fairness' in work or practices in the classroom or is this shown through activities or relationships observed? (Charmaz, 2014).

Having access to choice and control

For children, there was a sense that the 'teacher knows best' in terms of what manipulatives or pictures they might need to be able to learn mathematics. Although there was a strong sense of liking for particular manipulatives, for example Dienes equipment, there was not a sense of agency in terms of identifying equipment for themselves and being able to go and access it independently, despite this being one of the aspects of agency that the Head Teacher was looking for when observing for mastery learning in classrooms.

For the teacher, pedagogical agency was another dilemma or tension as she accepted that there was an expectation of school leaders that mastery learning in mathematics involved the children moving together through the curriculum, but she used very emotive language to describe that 'doing the best' for her class meant that some children needed something different:

> …there is a massive gulf and actually I can let them drown by pretending that we're all together, but they can't actually cope with it and they're not actually making progress they're just copying from their neighbour or just watching what they're doing, or I can actually try and teach the next bit that they need.

Again, this dilemma surrounding adaptive teaching and 'one size fits all' will need further critical exploration in the data.

Conclusion

Constructivist grounded theory is enabling an inductive approach to the analysis of the data that has been co-constructed in the classroom. Although the data reported here only touches on the beginning of a more focused coding stage, some theoretical underpinnings to the data in terms of social justice can be examined to enable sense-making to occur. For example, Watson (2021) locates care for the learning of mathematics as the overlap between care for students and care for maths, elements of which are emerging from this data. Also, the field of the classroom and social reproduction of inequalities in education is also visible in the data (Bourdieu and Passeron, 1990). Theoretical coding will become more established following more focused coding of the whole data set. Through a social justice lens and constant comparison with the research question, the themes emerging suggest that social justice is terms of children's classroom experiences is not guaranteed emerges through the pedagogical dilemmas of the teachers and school system that reproduce inequality despite teachers caring for social justice within mathematics education.

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