THE VOICES OF STUDENTS LABELLED AS LOW ATTAINING IN MATHEMATICS: ECHOS OF DOMINANT DISCOURSES

Rachel Helme

University of Bristol

Dominant, deficit discourses can be prevalent in the culture that surrounds students labelled as low attaining in mathematics. Drawing on a model of deficit discourses in mathematics education, this report reflects on how the echoes of dominant discourses pervade the students' own stories about their lived experiences of the teaching and learning of mathematics. Using the poetic inquiry method of the Listening Guide to lean in and listen carefully, I examined how students talked about themselves in relation to mathematics and found that there was a clear influence of these cultural discourses on the stories told by most students, However, defying these discourses allowed one student to re-narrate themselves from a more positive viewpoint.

INTRODUCTION

Thompson (2014) states that students will perceive themselves as others see them and, as such, deficit discourses around the low attainment label in mathematics education have become reifying (Sfard & Prusak, 2005), that *doing* has become *being*. In this research report I reflect on the findings from a broader study, based on the work of Sfard and Prusak (2005), into the stories-as-identity-work of five students labelled a low attaining in mathematics (Helme, 2023). These students had been compelled to continue to study mathematics in college after not attaining a pass grade in their mathematics examination at the end of compulsory education. The discussion that follows focuses on the cultural discourses that echo in and around the stories that the students told about their lived experience of learning mathematics. I highlight that these echoes were employed by students however there was also evidence of defiance, a re-narrating within the shared stories.

DEFICIT DISCOURSES AND THE LOW ATTAINMENT LABEL

Adiredja and Louie (2020) proposed a model of deficit discourses, in relation to the teaching and learning of mathematics, made up of two elements: namely, narratives about students from marginalised groups, and narratives about what counts as mathematics. The authors stated that the reproduction of deficit discourses goes beyond the biased individual, such as a teacher, being nested in local educational practices and cultural discourses in wider society. Students labelled as low attaining can be described as marginalised in the sense that their voice is not often heard over the voices of other narrators, such as teachers and researchers. The notion of silencing and preconceptions creating the marginalisation of these students. In addition, what counts as mathematics for students labelled as low attaining, the second elements of the model, relates to what

2026. In H. Krzywacki, M. Hähkiöniemi, E. Haataja, M.S. Hannula & P. Hästö (Eds.). *Proceedings of the 49th Conference of the International Group for the Psychology of Mathematics Education: Research Reports*, pp. 611-618. PME.

counts as success and failure in mathematics. How they see themselves as mathematicians is viewed through their outcomes from both informal and formal assessments (Norris, 2022). For students labelled as low attaining, their *voice*, either spoken or evaluated via assessments, is more often than not missing from these discourses.

Narratives about and by students labelled as low attaining.

The first element of the model of deficit discourses proposed by Adiredja and Louie (2020) relates to narratives about marginalised students, in this case students who are labelled a low attaining. Learning in mathematics is often described using linear metaphors, such as narrow paths or stepping stones, with new knowledge built incrementally on what is previously learned (Norris, 2022). A hierarchical metaphor supports a notion of fixed ability, the sense that some are ahead and some are behind in relation to mathematical knowledge or other students. Particularly for students labelled a low attaining, the view of an inherent nature to characteristics and learning behaviours leads to the assumption of individual, personal faults that determine a student's position on the linear metaphor of learning. There is a sense that the students themselves have responsibility for improving, rather than for example addressing issues with teaching practice, implying that lack of success is a result of lack of effort and motivation (Zavala & Hand, 2019).

Assumptions around students labelled as low attaining can lead to discourses about classroom behaviours and learning needs, leading to lower expectations and overly structured lessons to control perceived negative learning behaviours. These assumptions can result in restrictive teaching and learning practices; a modified curriculum delivery, intended as supported and nurturing, but implemented as revisiting and reteaching previous topics (Coles & Brown, 2021). Students have described the impact of practice and policy decisions, such as the need to retake examinations to improve the outcome as well as the allocation of, and interactions with, significant others, for example teachers (Noyes & Dalby, 2020). Students labelled as low attaining report feelings of powerlessness, shame and inferiority, unable to address the impact of the low attaining label (Hargreaves et al., 2019).

Narratives about what counts as success and failure in mathematics.

The second elements of the model of deficit discourses considers what counts mathematics; for students labelled as low attaining, what counts as success and failure in mathematics. Mathematics has been described as a set of established facts, rules and algorithms that should be followed correctly to be seen as a mathematician (Adiredja & Louie, 2020). There is a characterisation, often in popular media, of an individual pursuit that should be quick, efficient and without mistake (Mendick & Moreau, 2014). A struggle in mathematics, whether working slowly or making mistakes, is seen as sign of failing rather than the process of developing understanding. However, taking a different view, struggle could be argued to be a conflict between a student's own

informal knowledge and the formal, standardised way that the subject is presented. The teacher, seen as the holder and presenter of the mathematical knowledge, is to be privileged over any informal knowledge of the student, thereby sanctioned as correct and to be mimicked by the student (Francome & Hewitt, 2020).

Alongside the discourses around the characterisation of a success (and failure) in mathematics and the privileging of teacher knowledge, is a discourse around the result of high-stakes, summative assessments. The outcome of a pass is perceived as a currency; a ticket to future success which has devalued any lower outcomes (Norris, 2022). This is despite the hard work and effort that the lower grade might represent. Students talk about cycles of failure that in turn impact their motivation, exacerbated by government policies in which students are compelled to continue study mathematics in college if they did not achieve the pass level outcome.

METHODOLOGY

The broader study was based within a post-16 college in England. Four students, Ava, Betty, Christine and Darren, were observed and interviewed between October and December of 2019 (pre covid) and one student, Claire, was interviewed online three times between November 2020 and May 2021 (during covid). In the broader study, but not discussed here, their teacher was also interviewed as a significant other in the stories-as-identity-work of the five students.

The data collection methods involved object-elicited interviews, including discussions around artifacts such as students' classwork, conversations and actions observed by the researcher in the classroom, and digit images sourced by Claire to represent her experiences of learning mathematics. The purpose was to learn in and listen carefully to the lived experiences of students, labelled as low attaining, from their own point of view.

Poetic data analysis

Poetic inquiry is a methodology that has been used in mathematics education research as a promising technique for discourse analysis, such a poetic repetition in dialogue (Staats, 2021). In this study, listening to the data was seen as embodied and relational; decentring self as a researcher to make space for the voices of others. Hence, the study drew on a poetic inquiry methodology to go beyond narrative content towards feeling language, experiencing emotionally the words of participants (Faulkner, 2019). The *Listening Guide* is a poetic, voice-centred, relational method of analysis developed through the work of Gilligan et al. (2006), which describes voice as the core of self, often called the root voices. There is a sense of relationality with multiple voices intermingling in counterpoint (a term taken from music theory) to create an overall melody of meaning. This radical way of listening to data has a range of perspectives, including examining who is speaking; in what body; stories about relationships; in which societal and cultural framework (Macaulay & Kaukko, 2025). This report considers both who is speaking, and how they are speaking, against the backdrop of

cultural dialogue, that is the echoes within individual stories of dominant, deficit discourses.

The Listening Guide has four different listening stages, with a key innovation of the creation of a I-poem to draw the researcher attention to the various ways the participants talk about themselves (Gilligan et al., 2006). The creation of the I-poem (more recently described as pronoun poems) involves the underlining of the speaker's use of a pronoun in their narrative as well as the related verb and any other words that seem important. These phrases are then extracted, in order, to create a poetic structure. A demonstration using data from the study is below:

> I have to go off my instincts which is not always right so like in class I will be like 'is this right?' and it will be but sometimes I will be a little bit away from it so will get the right answer but I need to do more {pause} expand the answer {pause} but in the exam I have to write it down and I start questioning it if it is right.

I-poem:

> I have to
>
> I will be
>
> I will be
>
> I need to do more
>
> I have to
>
> I start questioning

The I-poem focuses the researcher on listening closely to the speaker's choice of words, without the associated noise of the whole narrative. Returning to the example above, there can be seen the voices of both personal action *I have to* and the more poignant voice of struggle *I start to question*. The process of creating and examining pronoun poems enables the researcher-listener to return to the whole narrative with a more nuanced sense of the voices of the speaker to consider how these voices both present themselves, and intermingle, in the data.

FINDINGS

Creating and examining the I-poems from the student participants' narratives data, I identified a multitude of voices, however most had similar wider characteristics, that is voices of action, and voices of motivation and affect. The voices of action, personal and by others, included: *I am looking at it* (Ava); *I didn't get much help* (Claire); and *I have got to* (Darren). The voices of motivation and affect included: *I am just trying to get through* (Betty); *I just can't be bothered* (Christine); and *I get confused* (Darren). In addition, there were some examples of other voices, such as: mitigation, *I had loads of different teachers* (Betty); want/need, *I need to get [a pass grade]* (Christine); and struggle/understanding *I could finally understand* (Claire).

Returning to the full narratives, I focused on the voices and looking for how they communicated the stories about the lived experiences of the students. It was through the process of returning to the narratives that I began to recognise the echoes of dominant, deficit discourses. In rest of this report, I discuss how some of the students employed the discourses, however echoes were also defied, re-narrated by one student.

Echoes of dominant discourses

In examining the stories identified in the full narratives, I noted that dominant discourses could be heard to echo in the students' story telling. Darren used an intermingling of his action voice and that of affect to talk about his struggle showing working out:

> Darren: I know how to do it, but it is tricky to explain I just leave it at least I know how to do it but, in the exam, I need to get those marks, so I need to write it down.

Darren sounded vulnerable as he described his individual responsibility to improve in lessons and examinations, that "writing down" was an expected classroom learning behaviour. Ava also used action and affective voices to talk about struggle:

> Ava: I was ok with everything but when I think about it, I think differently.…I am trying to convert it like that and now it is quite hard to convert it on that [sic]. Yes, and so that is why I was struggling.

Ava suggested that the reason she struggled, in this case with converting between metric measurements, was because the teacher had demonstrated a method "to convert it like that" which was different to her own. In both these examples there was an echo that the teacher's way of working, both learning behaviours and demonstrated methods, had priority over their own ways of being mathematical. There was the implication of an individual responsibility, where being mistake free is compared to a teacher's method and writing down a measure of success.

Alongside taking personal responsibility for progress, there was a clear echo of the importance of a pass outcome in high-stakes examinations. As Christine stated using her affective voice:

> Christine: Obviously in year 11 I went to P0 and stuff because I wanted to pass…. {sigh} I don't know I have failed four times and I literally can't be assed {paused}I need maths, but I just can't be bothered to do anything about it.

Christine talked about going to revision classes before school (P0) but still did not passing her examination. She expressed her frustration, knowing she needed to pass her mathematics as currency for university, however despite acting in the way she thought was necessary, she repeatedly failed, which was impacting her motivation.

The student participants shared stories about their personal characteristics and their affective responses to learning. Betty used her mitigating voice to describe issues with concentration:

Betty: The attentions gone I can't just sit and do anything for a long time let alone maths. Even on my actual course I can't just sit there …. I will start chatting.

It seems that Betty believed that becoming distracted was both inherent and inevitable. There was an echo of characteristics and affective responses as personal faults that negatively influenced learning behaviours and hence lead to lack of success in mathematics.

There were stories told about past and present learning experiences, highlighting the impact of significant others including teachers and wider institutional policies. Betty used her mitigating voice, intertwined with affect, to talk about the frustration of being move to a different examination tier:

Betty: I was put in [the higher tier class] in year 11 and I don't know why and then I had to drop down to [the foundation tier] so that was like {pause} towards the end of year 11 so literally [sic] just got into the exam just as I went into foundation again.

For Betty, the changes in the level of exam were both unexplained and last minute, happening in her final year of compulsory education. Alongside frequent changes in staffing, she saw these changes as mitigating factors in her examination outcome. There were echoes of being powerless, that the policies and practice of others were more important than her own decision making; made for her, not by her.

The defiance of Claire's stories

For Claire, there were still echoes of dominant discourses, however some she employed and some she defied. The most significant echo was the status of a pass outcome:

Claire: I personally think that I am approving [sic] massively and that I am pushing myself to get the correct grade that I need to get to pass maths this year.

In her language of success or failure, understanding or not understanding, she compared her progress in terms achieving a "correct grade" in assessments. Being successful was a matter of being mistake free in order to gain the desired outcome. However, Claire's experience was different to the other students; she may have been aware that she would not sit a final examination, due to covid-19 restrictions, rather her outcome would be teacher assessed. The pass outcome was relevant in all her work, every day, towards building up a positive picture of her capability in mathematics.

Claire told stories of characteristics that benefited her learning, ways in which she was personally overcoming issues with learning:

Claire: Maths did annoy me and made me feel like I couldn't understand but as I kept trying and trying it got clearer to me, and I felt like I could finally answer questions.

Claire saw that through her own efforts, using facets of her characteristics such as perseverance, she was seeing improvement, although once again this was measured

against the echo of the pass outcome. Claire defied the echo that issues with learning were personal faults, re-narrating characteristics as personal strengths rather than a hinderance, a way to overcome the barriers to learning.

Claire challenges the echo of solely personal responsibility for improvement:

> Claire: I didn't get much help therefore I struggled a lot and every time I asked for help and support I wouldn't get it …. whereas now I get support and help from my maths teacher, and he always explains in a way I understand.

Claire contrasted her previous and current experience of learning mathematics. She suggested that success (or failure) was the joint responsibility with the teacher. However, in later interviews, she goes on to talk about needing to "brush up on skills" and "pushing herself to get a pass grade"; it seemed she saw both personal and joint responsibly for success. She was re-narrating that both her own actions, and those of the significant other that was her teacher, were key factors toward gaining her success of a pass outcome, changing her relationship with learning mathematics. It is interesting to note that for this theme of significant others, rather than being narrated by echoes of dominant discourses, was re-narrated by Claire, not just passive but actively influencing the discourses.

DISCUSSION AND CONCLUSIONS

In this research report, I reflect on the findings of a broader study into stories-as-identity-work told by students who had been labelled as low attaining in mathematics. Supported by a poetic methodology that focused on the voices of the students, the findings demonstrated echoes of dominant, cultural discourses permeating the stories told, the most prevalent being the status of a pass grade in a high-stakes examination. However, there was also evidence of the re-narration of the echoes of dominant discourses, challenging the cultural stories that seemed otherwise influential.

It is clear that the findings of this study are limited by the small number of participants involved, however there are discussions in wider research that support the importance of challenging dominant discourses about low attainment. Thompson (2014) talks about student seeing themselves as other see them, with Mkhize (2017) arguing that given the opportunity, students will define themselves in positive terms. I argue that the notion from that there is a core of self or a root voice should be measured against the cultural discourses. Fundementally, as teachers and researchers, there is an imperative to challenge the dominant, cultural discourses that seem to influence how students see themselves in relation to the teaching and learning of mathematics.

References

Adiredja, A., & Louie, N. (2020). Untangling the web of deficit discourses in mathematics education. *For the Learning of Mathematics, 40*(1), 42-43.

Coles, A., & Brown, L. (2021). Differentiation from an advanced standpoint: Outcomes of mathematics teachers' action research studies aimed at raising attainment. *Mathematics Teacher Education and Development, 23*(3), 166-181.

Faulkner, S. L. (2019). *Poetic inquiry: Craft, method and practice* (2nd ed.). Routledge.

Francome, T., & Hewitt, D. (2020). “My math lessons are all about learning from your mistakes”: How mixed-attainment mathematics grouping affects the way students experience mathematics. *Educational Review, 72*(4), 475-494.

Gilligan, C., Spencer, R., Weinberg, M. K., & Bertsch, T. (2006). In the Listening Guide: A voice-centered relational method. In S. N. Hesse-Biber, & P. Leavy (Eds.), *Emergent Methods in Social Research* (pp. 253-271). SAGE Publications, Inc.

Hargreaves, E., Quick, L., & Buchanan, D. (2019). "I got rejected": Investigating the status of ‘low-attaining’ children in primary-schooling. *Pedagogy, Culture & Society, 29*(1), 79-97.

Helme, R. (2023). Foregrounding the voices of students: Extending the Listening Guide in a feminist poetic inquiry into identity work in the context of low attainment in mathematics [Doctoral dissertation, University of Bristol]. Explore Bristol Research. http://research-information.bristol.ac.uk/.

Macaulay, L., & Kaukko, M. (2025). From 'I-Poems' to 'Pronoun Poems': Listening for the collective voice through a voice-centred relational methodology. *International Journal of Qualitative Methods, 24*, 1-10.

Mendick, H., & Moreau, M.-P. (2014). Using popular culture. In D. Leslie, & H. Mendick (Eds.), *Debates in mathematics education* (pp. 17-26). Routledge.

Mkhize, D. R. (2017). Forming positive identities to enhance mathematics learning among adolescents. *Universal Journal of Educational Research, 5*(2), 175-180.

Norris, J. (2022). The positioning of GCSE and Functional Skills in Further Education: How do vocational students make sense of post-16 mathematics pathways? *Research in Mathematics Education, 24*(2), 1-19.

Noyes, A., & Dalby, D. (2020). *Students' perspectives on mathematics in Further Education colleges. The mathematics in Further Education colleges project: Interim report 3.* https://www.nottingham.ac.uk/research/groups/crme/documents/mifec/interim-report-3.pdf

Sfard, A., & Prusak, A. (2005). Telling identities: In search of an analytic tool for investigating learning as a culturally shaped activity. *Educational Researcher, 34*(4), 14-22.

Staats, S. (2021). Mathematical poetic structures: The sound shape of collaboration. *Journal of Mathematical Behavior, 62*.

Thompson, G. (2014). Labeling in interactional practice: Applying labeling theory to interactions and interactional analysis to labeling. *Symbolic Interaction, 37*(4), 458-482.

Zavala, M. d., & Hand, V. (2019). Conflicting narratives of success in mathematics and science education: Challenging the achievement-motivation master narrative. *Race Ethnicity and Education, 22*(6), 802-820.