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Critiquing Bourdieu: Implications for doing critical pedagogy in the mathematics classroom

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Bourdieu's ideas are highly influential amongst critical mathematics education theorists, and yet there is little consensus on how they might be applied to classroom practice. This paper develops a critique of Bourdieu's theoretical tools that offers greater insight for practitioners. We argue that a greater understanding of the dialectic between the use value and exchange value of school mathematics can help in exposing and challenging exploitative practices. Through applying our critique to the 'Teaching Mathematics for Social Justice' research project, we generate further insight that will inform others committed to doing critical pedagogy in the mathematics classroom.

Introduction

The popularity of Bourdieu's theories amongst mathematics education researchers was evident in the high turnout at a recent Critical Mathematics Education Working Group session at a day conference of the British Society for Research into Learning Mathematics (BSRLM) which offered an opportunity to discuss how these theories might inform classroom practice (Wright, 2020a). Whilst there was consensus that Bourdieu's theoretical tools can help to explain the exploitative nature of school mathematics, and the associated reproduction of inequities in educational outcomes, there was less agreement on how to use them in developing practical strategies to challenge the status quo. This paper explores how Bourdieu's theories might be developed and built upon to inform the classroom practices of those committed to challenging the exploitation of mathematics learners from marginalised groups.

Bourdieu's theoretical tools applied to education

Bourdieu argues that one of the primary functions of schooling is to reproduce existing power relations within society by affording systemic advantage to students from already-dominant groups over those in less dominant positions (Bourdieu & Passeron, 1990). He singles out mathematics as playing a key role in this function:

Often with a psychological brutality that nothing can attenuate, the school institution lays down its final judgements and its verdicts, from which there is no appeal, ranking all students in a unique hierarchy of all forms of excellence, nowadays dominated by a single discipline, mathematics. (Bourdieu, 1998, p. 28)

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School mathematics serves as a critical filter in regulating who has access to more prestigious higher education courses and better-paid employment (Jorgensen, 2016). The persistent and strong association between socio-economic background and success in school mathematics is a manifestation of how mathematics functions as a tool of stratification or ‘gatekeeper’ (Gates, 2003) in excluding marginalised groups in society from accessing broader forms of economic, cultural and academic capital.

Bourdieu highlights how the reproductive function of schooling relies on a misrecognition of the school as a meritocracy in which those who succeed do so as a result of their natural ability or giftedness, thus hiding the systemic advantage (or capital) that is afforded to students from more privileged backgrounds (Bourdieu & Passeron, 1990). This explains the common belief that mathematical ability is innate and the predominance in many countries, including England, of ‘setting’ (or grouping students by prior attainment), despite contrary research evidence suggesting this has little impact on educational outcomes (Francis et al., 2017). The act of ‘symbolic violence’ involves children and families from marginalised groups accepting, and contributing towards, their occupation of lower or dominated positions in the field by assuming responsibility for their own lack of success (Bourdieu & Passeron, 1990).

Bourdieu (1986) describes how some social and cultural resources, i.e., ‘symbolic capital’, are more highly valued and legitimised by the school. He argues that families from dominating class positions accumulate higher levels of social capital, which they invest in helping their children develop a ‘mathematical habitus’ that aligns more closely with the values of the school, e.g., through consciously initiating counting games to prepare them for mathematics lessons. This gives students from more privileged backgrounds an advantage in accumulating the ‘mathematical capital’ that helps them to identify as mathematics learners and to take advantage of opportunities presented in the classroom (Williams & Choudry, 2016).

Whilst Bourdieu’s theoretical tools offer critical insight into the structural conditions that produce and reproduce inequalities, they are limited in identifying ways for classroom practitioners to disrupt or even transform such cyclical structures (Wright, 2020a). Bourdieu and Passeron (1990) pose the following paradox in highlighting the dilemma faced by teachers who wish to challenge the exploitation faced by students from marginalised groups in their classrooms:

Either you believe I’m not lying when I tell you education is violence and my teaching is legitimate, so you can’t believe me; or you believe I’m lying and my teaching is legitimate, so you still can’t believe what I say when I tell you it is violence. (p. 12)

By acting as its agents, such teachers themselves might be seen as endorsing the system they wish to call into question. How, then, might teachers and educators wishing to fight injustices and challenge inequities within the mathematics classroom do so within a system that appears to be inherently stratified? One approach that has been advocated is to help students from less privileged backgrounds realign their habitus with the middle-class values recognised by the school (Jorgensen, 2016). However, Bourdieu contends that the structuring

of habitus and symbolic capital functions to (re)produce positions in the field, meaning ‘success’ in mathematics for the few is always held relative to the failure of others. He would therefore argue that this approach enables some students to join the dominant group and share in the exploitation of others, whilst giving credence to the claim that school is a genuine meritocracy (Bourdieu & Passeron, 1990).

Gutiérrez (2008) warns of the dangers of ‘gap gazing’, highlighting how mathematics education researchers often focus too narrowly on closing attainment gaps between different groups, whilst ignoring issues of learners’ identity and power/agency. This serves to reinforce deficit thinking and negative narratives about students from marginalised communities. Those advocating for equity and social justice must aim to expose and challenge systemic injustices as well as looking for strategies that help marginalised students become more successful. Understanding the reproductive function of education might well be a precondition for appreciating its potentially transformative function (Wright, 2020a). In the following sections, we develop Bourdieu’s analysis in relation to school mathematics with a view to identifying actions that might be taken by those wishing to disrupt its reproductive nature.

Relating ‘use value’ and ‘exchange value’ to teaching and learning mathematics

Williams and Choudry (2016) argue that understanding mathematical knowledge as ‘mathematical capital’ focuses on the ‘exchange value’ of school mathematics, i.e., the extent to which mathematics knowledge/qualifications can provide access to positions of power and the means to dominate others. They argue that attention should also be given to the ‘use value’ of school mathematics, i.e., its application to modelling/solving real-life problems (functional knowledge), as well as the pleasure/ satisfaction of doing mathematics (consumption of knowledge). This reflects what equity-minded teachers often see as the two most important but contradictory aims in supporting students from marginalised groups in their classes (Wright, 2016): enhancing their enjoyment of, and engagement with mathematics through providing meaningful/relevant problem-solving activities (promoting the ‘use value’ of school mathematics); and helping them to attain the grades in school examinations that will broaden, rather than restrict future life opportunities (promoting ‘exchange value’).

Black, Choudry, Howker, Phillips, Swanson, and Williams (2021) draw on the praxis of ‘Funds of Knowledge’ (FOK) to address the above contradiction with implications for developing critical pedagogy in mathematics education. The FOK approach emphasizes how knowledge and experiences that students bring with them from their home/community environments offer rich resources for the development of a school curriculum which establishes meaningful connections with their lives beyond school (Moll, Amanti, Neff, & Gonzalez, 2009). It challenges normative assumptions that children from marginalised communities are in some way ‘deficient’ and highlights how funds that learners might contribute towards learning are often ignored by the teachers/school.

Black et al. (2021) offer a critique of the FOK approach, whilst also recognising its critical aspects (in that it rejects a deficit view of marginalised learners). They highlight how FOK does not necessarily challenge the process of capital exchange but can serve to transform resources learners bring with them from their community primarily into resources with exchange value within the educational field. Hence, ‘domesticated’ approaches to FOK may allow some marginalised students to gain greater access to the formal curriculum without challenging the hegemonic practices of schooling that maintain the marginalisation of others. This critique aligns with Freire (1972) who argues that emphasis should be placed on empowering learners to use the resources they bring with them to raise their consciousness, i.e., become more aware of structural inequalities so that they may challenge them, rather than merely to achieve success within a formal curriculum. He sees the role of the ‘educator’ as enabling learners to develop collective agency so that they begin to see oppression as a limiting situation that they can transform. In mathematics education, we argue that teachers and educators should go beyond enhancing the mathematical capital of marginalised students and instead seek ways to expose and challenge common assumptions and myths, e.g., that the mathematics classroom is a level playing field, which serve to disguise the arbitrary characteristics of mathematical capital (Williams & Choudry, 2016). By challenging dominant discourses, the exploitative aspects of school mathematics can be exposed and undermined.

The above critique suggests a need to reconceptualise FOK as a ‘cultural commodity’ that can be used to mobilise collective power to challenge exploitative practices associated with school mathematics (Black, et al., 2021). This recognises the dynamic unity of both use value and exchange value (capital) involved in coming to know mathematics. The knowledge, competences and academic identities that allow learners to gain school qualifications offer exchange value in the form of mathematics capital and this capital also has more immediate exchange value in that it enables individuals to acquire the power needed to manage power relations within the educational field for their own benefit (Williams, 2016). Additionally, the use value of knowledge, competences and academic identities can be interpreted narrowly, as preparing individual students for future study or employment (meeting economic needs), or more widely as fulfilling an individual’s social, political and recreational needs. From a Freirean perspective, use value can also be seen in terms of meeting the collective needs of the community (or humanity), through mobilising solidarity with those who are exploited and engaging in collective action to challenge oppression. Black et al critique ‘domesticated’ versions of FOK that aim to help individual learners accumulate mathematical capital for private gain, rather than mobilise funds for public good. The appropriation by the school of the resources that students bring with them from their home/community means that the potential use value of these resources, particularly relating to its critical use in challenging oppression, may not be realised.

This critique of domesticated versions of FOK highlights a potential contradiction between enabling individual learners to accumulate power within the educational field (exchange value) and addressing the collective needs of the community (use value). Developing students’

knowledge and identities as a 'cultural commodity' involves harnessing this contradiction through taking actions that enable marginalised students to become successful in school mathematics whilst also challenging the conditions that result in their marginalisation. In seeking such actions, teachers and educators must take account of 'dark FOK' (which we refer to as 'difficult FOK'), i.e., knowledge/experiences directly related to exploitation that may be painful or challenging to confront, rather than focusing on 'light' FOK, i.e., positive experiences (Zipin, 2009). Similarly, teachers/educators need to engage with the full range of emotional experiences that students experience in their struggle against oppression.

Application of theory to practice

In this section, we apply some of the concepts discussed above to the Teaching Maths for Social Justice (TMSJ) research project. Whilst the project was not consciously designed around a FOK approach, we highlight below how considering the dialectic between use value and exchange value (see previous section) helps to generate new insight from the project findings and to inform others wishing to do critical pedagogy in the mathematics classroom. The methodology and findings from the TMSJ project have been reported in detail elsewhere (Wright, 2016, 2017, 2020b). Here we focus on those aspects of the project we consider most relevant to our argument.

The project was a collaboration between an academic researcher (the first author of this paper) and five teacher researchers (Anna, Brian, George, Rebecca and Sarah – all pseudonyms), based in four different multi-ethnic and non-selective schools in deprived areas of London. All four schools had a relatively high proportion of students in the following categories: those eligible for free school meals, those speaking English as an additional language, and those identified as having special education needs. The project involved three participatory action research cycles, spread over the 2013/14 academic year, in which the research group planned, tried out in the classroom during 'research lessons', and evaluated a series of teaching ideas, approaches and activities. The findings were generated from the action research cycles through an iterative process that included various methods of data collection (including surveys, interviews, research journals) and analysis (including reflective discussions, planning/evaluation meetings, thematic analysis, coding).

The research group adopted the following conceptualisation of teaching mathematics for social justice, drawn from critical mathematics education research literature (e.g., Gutstein, 2006; Skovsmose, 2011) that teacher researchers were encouraged to read:

1. Promote engagement through collaborative/discursive problem-solving approaches.
2. Provide meaningful activities by drawing on learners' real-life experiences.
3. Use mathematical inquiries to enable learners to better understand their own situations.
4. Develop learners' agency through facilitating mathematical investigations.
5. Develop a critical understanding of the nature/position of school mathematics.

These five aims appear to relate closely to the notion of the cultural commodity presented earlier. Taken in isolation, aim 2 might suggest a domesticated approach to FOK that focuses

on exchange value and ignores systemic causes of marginalisation. However, aims 2, 3 and 5, taken together, offer the possibility of utilising resources students bring with them from their community to expose conditions that result in their marginalisation. Aims 1 and 4, alone, might suggest a focus on accumulating mathematical capital through generating powerful knowledge for the individual. However, as noted above, such powerful knowledge is also vital for mobilising the collective power needed to challenge exploitative practices.

The teacher researchers articulated how this conceptualisation resonated with their reasons for becoming mathematics teachers in the first place. However, they initially perceived these aims to be in direct conflict with the need to enable their students, particularly those from marginalised groups, to achieve the grades in terminal school exams that will enhance future life opportunities and choices (reflecting the exchange value of school mathematics). The perceived conflict between the exchange value and use value of mathematics generated significant discomfort amongst teacher researchers in relation to their identities as teachers.

Whilst other teachers would probably love to do this stuff [TMSJ aims], they don't have the confidence that the children would get the grades that they need to get in half term tests. That is the single main constraint, I think. And also, unless teachers have read up on this way of teaching, they won't necessarily trust that it will get long-term results either. They'll just think that it's a very risky strategy. (Anna, Interview 2)

The teacher researchers highlighted constraints they faced in adopting alternative practices that promote the use value of mathematics. These include the lack of time and easily accessible resources, the pressure to get through a rigid scheme of work, and a culture of performativity in schools that discouraged risk taking in the classroom. For instance, senior managers would often undertake 'learning walks' that involved short and unannounced visits to classrooms to make 'on-the-spot' judgements about the quality of teaching and learning. However, the mutual support provided by the research group gave teacher researchers the confidence to take risks in their classrooms and to begin to put into practice the five TMSJ aims. They tried out a series of classroom activities that drew on students' real-life experiences and linked these to mathematical concepts and social justice issues. For instance they instigated a debate on how to distribute a fixed amount of money as wages amongst a group of workers (e.g., doctor, nurse, cleaner, ...), taking into account the value attached to each person's work, and how to display/measure the resultant levels of inequality (e.g., using Lorenz curves/Gini coefficient). Through jointly planning and evaluating activities in research group meetings, they became more aware of strong links between particular social justice issues and mathematical concepts, making it easier to identify opportunities in the scheme of work to introduce TMSJ activities.

It's given me the confidence to step off the scheme of work treadmill, of getting through different topics or chapters, and actually saying: 'Well, these topics, say cumulative frequency, or percentages, I can fit these within a project on something to do with these kids' world, or to do with our world as a whole'. (Brian, Interview 3)

The teacher researchers described how providing students with learning experiences with greater relevance to their lives outside school led to significant increases in the engagement and enjoyment of students, particularly those from marginalised communities, not just during the research lessons, but with school mathematics in general. This relates to the notion of individual use value. Providing more meaningful contexts enabled students to gain a deeper understanding of mathematical concepts whilst increasing their motivation to learn more formal/abstract mathematical procedures needed for achieving success in school mathematics.

Many of the activities tried out in research lessons drew on positive FOK, e.g., the 'Election' activity introduced students to the mathematics behind different methods of counting votes by exploring how these could be used to agree the class's 'favourite film of all time'. However, other activities drew more on difficult FOK, e.g., by tackling issues around debt and pay-day loans. The teacher researchers recognised the need to tackle these issues sensitively as they directly affected the families of some students in the class. They also reported how these activities provided opportunities to develop a greater appreciation of the struggles some students faced on a day-to-day basis and how these impact on learning. Building empathy between teachers/students seems essential for enhancing the collective use value of school mathematics.

Whilst the teacher researchers decided the focus for many of the activities, for the 'Making a Change' activity, they provided an opportunity for students to explore their own issue. Students were encouraged to choose an issue of interest to their group, to identify a change they would like to see made, to use mathematics to construct an argument in support of this change and to present their findings to other students in the class. The teacher researchers were surprised by the overwhelmingly positive response to the activity and the strength of students' arguments for change, particularly from those previously identified as low attaining or disengaged.

I liked the presentation as I got to do something that I felt strongly about. It gave me a chance to express how I feel, also including maths to support my presentation. (Student in Rebecca's Year 9, set 3 of 4, survey response to 'Making a Change' activity)

The agency demonstrated by students in using mathematics to argue for the public good, in some cases around issues relating to systemic causes of inequity (e.g., one group chose to investigate favouritism exhibited by teachers towards students whilst another group explored discrimination experienced by disabled people), highlights the potential for developing the collective use value of school mathematics.

The teacher researchers acknowledged the opportunity provided by the research group to engage with academic research, and to use this in challenging dominant discourses and to reflect critically on their own practice and that of others. They began to question their previous beliefs, e.g., that equality could be realised merely by working harder to help marginalised students gain greater success. They started to recognise systemic causes of inequality and barriers to learning, e.g., they became increasingly aware of the damaging effects of setting (grouping students by prior attainment), which was used in all four schools. They also became conscious of their tendency to avoid trying out innovative teaching approaches and ideas with lower-attaining students and began to appreciate the importance of providing

all students with engaging and empowering learning opportunities. Indeed, they noted how the ideas tried out during research lessons had the greatest impact on students from marginalised backgrounds and those previously alienated from school mathematics.

What struck me through incorporating TMSJ activities into my lessons was primarily how engaged students became, particularly low-attaining students who had previously hated maths. (Anna, final report)

The project suggests it is possible to harness the apparent contradiction between the exchange value and use value of school mathematics, by enhancing the engagement and achievement of students from marginalised backgrounds, and, at the same time, developing their appreciation of how mathematics can be used to solve real-life problems, understand their social/political/economic situations and to begin to develop arguments that challenge the conditions leading to their marginalisation. This helps to explain the significant interest in the project amongst colleagues in all four schools, as evidenced by requests for teacher researchers to share their findings in department meetings and to incorporate their ideas in developing schemes of work. The clear appeal to others of revealing the use/exchange value dialectic highlights the potential of methods adopted in the project for legitimising the teaching approaches and exposing/disrupting exploitative aspects of school mathematics on a wider scale.

Conclusion

Applying the concept of ‘cultural commodity’ to the TMSJ project demonstrates how the school mathematics curriculum can provide a site for collective struggle and for taking practical actions for the public good, whilst also recognising it as a site for the accumulation of capital. In attempting to put into practice the conceptualisation of TMSJ outlined above, teacher researchers enacted several changes that, whilst not necessarily revolutionary, might be seen as stepping stones towards disrupting the reproductive function of school mathematics, which restricts the accumulation of mathematics capital to students from privileged backgrounds. These included enhancing students’ agency and identities as mathematics learners (particularly those from marginalised groups) through seeing themselves in the activities (Gutiérrez, 2008), and becoming conscious of systemic causes of marginalisation, e.g., the stratification caused by setting. A broad conceptualisation of TMSJ, which harnesses the dialectic between use value and exchange value, is essential as, given the high-stakes nature of school mathematics, teachers/schools will not buy into the ideas and approaches that promote the former unless they also clearly embrace the latter.

Teachers need to be ready to become ‘activists’ (Gutstein, 2006) in developing empathy and building solidarity with students and marginalised communities and taking practical actions that expose and challenge the conditions that lead to their oppression (Freire, 1972). This is likely to be daunting for many teachers as it will require care and attention in tackling sensitive issues and may unearth raw emotions. It is also likely to encounter resistance, as the reproductive function of education serves to protect the scarcity of resources that hold exchange value so that privileged groups can maintain their dominant position (Bourdieu & Passeron, 1990). Educators should support teachers in this common struggle by establishing

networks of teachers that can provide the mutual support needed to encourage teachers to take risks and overcome constraints in the mathematics classroom. They also have a vital role to play in facilitating teachers' engagement with critical research literature that encourages them to challenge dominant discourses and interrogate existing practice.

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