Happier teachers and more engaged students? Reflections on the possibilities offered by a pedagogical approach co-developed by teachers and researchers

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Education, contradictorily, has been proposed as both a source of oppression (being a key institution involved in the reproduction of social inequalities) and a potential tool for social mobility, liberation and transformation. As is the case in various other nations, the current education system in England is characterised by the dominance of neoliberal ideas, expressed as educational performativity, in which schools are increasingly governed by the "methods, culture and ethical system of the private sector" (Ball, 2003, p.216). Notably, schools are subject to a regime of surveillance and inspection in which they are held to account for examination results and are placed in competition with other schools within an educational 'market' (Ball 2003).

As various commentators have noted, performativity can entail negative consequences – such as eroding and constraining teachers' agency, professionalism and pedagogy (e.g. Hennessy & McNamara, 2013; Murray, 2012), instrumentalizing learning, damaging student learner identities (Reay & Wiliam, 1999) and exacerbating inequalities between students and different types of school (Ball, 2008). Arguably, performativity makes transformational education more difficult to enact, as 'technicism and standardisation' (Hennessy & McNamara, 2013: p.6) prioritises attainment as narrowly defined, denying the legitimacy of teaching 'beyond' or 'around', side-lining concerns for equality in deference to the service of 'quality' and reducing the spaces available for teachers and students to innovate, reflect and 'think otherwise'.

In this article, we share insights from an ongoing research project ('Enterprising Science')i in which teachers and researchers have been working collaboratively to develop a pedagogical approach that aims to meaningfully engage students from socially disadvantaged backgrounds with science in ways that go beyond performative concerns with the learning of science content. Instead, this work seeks to find ways to both reform science education in more inclusive and socially just ways and to develop and realise the latent potential for science education to support and provide a space within which to develop young people's critical agency and active citizenship. Although our approach has only been developed in relation to science, we believe it could have resonance with any subject area, but especially those which are traditionally experienced as 'high status' fields and/or those with patterns of post-16 participation that tend to privilege dominant social groups.

Science classrooms provide an apt context for the study of inequalities. In the UK, as in most western nations, the profile of a typical university student in areas such as Physics and Engineering, remains male and middle-class. Women and those from working-class and Black Caribbean backgrounds remain starkly and persistently under-represented (e.g. Smith 2011; AAUW 2010). Moreover, criticisms have been made of the 'white, male, middle-class' dominant culture of science (e.g. Harding 1988; Ong 2005) and science teaching and learning (e.g. Atwater, 2000; Lemke, 1990).

Developing the 'science capital' pedagogical approach

As researchers, based at University College London[ii], and King's College London[iii], we have been working with teachers for four years to co-develop a pedagogical approach that can engage students from traditionally under-represented communities with science. Our starting assumption was pragmatic: most teachers are required to deliver a particular curriculum and work within institutional constraints, hence we wanted to develop an approach that can work 'with' everyday teaching, rather than creating new resources or curricula, or requiring too radical a change in school structures. Our approach is essentially a theoretically-informed 'lens', which enables teachers to work with 'how things are' but which can also enable some shifts in dominant power relations and the symbolic order and can support teachers to better connect with, value and engage students from historically under-served backgrounds. We drew on US 'funds of knowledge' approaches (Moll et al. 1992), which have been proposed as an equity-orientated, non-deficit approach to working with students from minoritised communities. We combined this with a sociologically-inspired approach (derived from the work of Bourdieu, e.g. 1977, 1984, termed a 'science capital approach', see Archer et al., 2015) that aims to focus attention on changing the 'field' – that is, the power relations and symbolic order which set the 'rules of the game' within a context (see Archer et al., under review, b).

Over the course of several whole year cycles, we worked collaboratively with teachers (through group sessions and regular lesson observations and one-to-one reflection meetings) to develop an approach that elicits and values students' ideas, experiences and cultural knowledges, and links these with science, with the aim of reducing the 'gap' between student '*habitus*' (their dispositions, 'feel for the game'), their '*capital*' (their cultural, social and economic resources) and the '*field*' of science education/ the science classroom. The approach involved teachers modifying existing lesson plans to take account of student contributions, identities and experiences and to then link these back to the science topic, skills or content in question, a process that was denoted by the shorthand 'Elicit-Value-Link'. The *Elicit-Value-Link* method of modifying lesson plans aims both to support teachers' valuing of students (and their diverse ways of being/ doing) within science classes and facilitate the translation of students' experiences, identities, interests and 'real world' knowledge and competencies ('use-value capital') into outcomes that might enhance their agency and social mobility ('exchange-value capital'). We also explicitly asked teachers to modify their lesson plans in ways that ensured the challenging of stereotypes (e.g. about 'who' does science) and to broaden and diversify the range of ways that students might be recognised as 'doing science' within their class (e.g. what 'counts' as science, valued ways of performing scientifically). In this way, we hoped that the approach might help reconfigure the dominant culture of science, particularly along gendered, classed and racialized lines. Teachers thus sought to move beyond contextualising science, to a more immediate and tailored reconfiguration of science as *personalised and localised* for their students.

Participating teachers

As work is still ongoing at the time of writing with our current sample of teachers and schools (from schools in Newcastle, York and Leeds), in this article we focus on findings from work conducted in 2015/16, with nine teachers from six inner-London schools, who participated in a nine month development and trial of the approach. Schools were selected on the basis of having relatively high proportions of students who spoke English as a second language and were registered as eligible for free school meals, compared to other schools in the same local area. The teachers each chose one main class to focus on, which produced a spread of year groups (1x Y7 class, 3 x Y8, 3x Y9 and 2x Y10) and attainment (set) groupings (4 x bottom set, 2 x middle set and 3 x top set). With the exception of students in Ms. Smith's school, students came predominantly from working-class backgrounds and a range of ethnic backgrounds, of which African, Caribbean, Bangladeshi, Turkish, Polish and Portuguese were most commonly represented. Data include field notes from nine months of classroom observations, 13 discussion groups conducted with 59 of the participating students and interviews/ workshop discussions with the nine teachers and survey data collected from students in each class.

'Happier' teachers and 'more engaged' students

Overall, as we discuss in more detail elsewhere[iv], we found that teachers and students were overwhelmingly positive about the approach, identifying a range of desirable outcomes. For instance, students and teachers reported that the approach made lessons more 'interesting' and, as end of year surveys indicate, students in intervention classes were significantly more likely than students who took part in a wider, national survey to agree with survey items such as 'I learn interesting things in science' (e.g. 75.7% intervention students vs. 68.2% national sample). As Tanisha, a Y7 mixed ethnicity girl, put it: "It makes the lessons fun".

Students and teachers felt that the "big difference" was that the approach had notably increased student understanding and engagement with science because it enabled students to see and experience a personal link with science, rather than it remaining abstract and at a distance from students' everyday lives. The personalisation of content also provided a more immediate frame of reference to help students make sense of the content and concepts they encountered. As Tahir, a Y10 Turkish boy explained, "it's a better way to make us remember things". Some teachers also reported quantifiable gains in attainment over the year.

Student participation in classes and class discussions broadened over the year and observations showed how the approach seemed to encourage a wider range of students to voice their views in class, particularly among those who were usually quiet and tended not to participate publically. As one student reflected, "cos like it brings everyone together, like, everyone has like something to say, instead of it just being like one or two people that know the answer".

While for some teachers, the approach was quite close to their existing practice, representing more of an enhancement and development of how they usually taught, for others it was a more significant departure. For instance, Ms. de Luca explained how she had changed her

usual 'strict' practice from closing down student discussion, explaining "now I kind of give them a bit more space to talk because I know that it's helping them to relate and engage more with the topic".

All the teachers felt that the approach had supported them to change their practice in meaningful ways (a change that was also noted by their students). Even the very experienced and highly competent teacher, Ms. Smith, reflected: "That's been a best part, you know - it really has changed how I teach". Teachers reported that they felt the approach had helped them to get to know their students better – and students reported feeling like the social distance between themselves and their teachers had been bridged a bit. Or as one student termed it, they felt the approach had made science lessons more "friendly".

For us, one of the key changes was an increase in teachers' own personal satisfaction and agency (see King et al., in press). As Mr Hobbes explained, "It's making me happier as a teacher". It is not uncommon for teachers to report experiencing sustained professional development in these terms, but one of the interesting aspects for us, was teachers' views that the approach helped to provide a framework and impetus for 'meaningful' teaching, which valued their professionalism, renewed their sense of purpose in teaching and enabled them to push back (to an extent) against educational performativity. Teachers described how they valued teaching for understanding (rather than 'to the test') and the approach helped justify this and shift their students' expectations away from instrumentalized approaches. Students themselves noticed (and liked) the difference in their teachers' approach, which they commonly described as 'going off topic'.

The teachers also reported how, over the course of the year, their colleagues came to show an increased interest in the project. At the outset, some teachers reported that some of their colleagues were uneasy or expressed concerns as to whether their 'trialling' of the approach might impact negatively on test and examination scores. However, these concerns seemed to dissipate as the year progressed – not least when such fears were not realised. Although cascading of the approach was not part of the project remit, by the end of the year, teachers were reporting positive interest and even a strong demand for them to cascade and share the approach with colleagues.

Of course, the trial was by no means an unbridled success – alongside the positive developments and gains reported above, the participating teachers needed to invest considerable time and energy to get to grips with the approach, particularly in the early stages. They all recounted needing to dedicate extra planning time and most found it substantially harder to enact with KS4 classes, where the demands of educational performativity were experienced the most acutely. In this respect, we suggest that the findings should be interpreted as interesting and promising, rather than definitive. Moreover, the findings suggest that many teachers would have benefitted for more than just one academic year's worth of support to fully embed the practice and that while the approach was deliberately formulated as a pragmatic, 'here and now' instrument for mitigating some of the pernicious effects of performativity, it's potential was still constrained by the demands and injuries of performativity - which we interpret as underlining the importance of continuing to

argue for both immediate and longer-term ideological changes in education in order to foster greater social justice.

Conclusion

Changing professional practice and trying to develop and enact social justice-orientated interventions within the existing education system is incredibly difficult and challenging – considerable investments of time, energy and emotion are required, alongside significant levels of cultural, social and economic resourcing. In this respect, the approach described in this article is certainly not a 'quick fix'. However, it may offer interesting insights to other teachers and researchers, not least as it suggests that some meaningful changes can be enacted in ways that are supportive for teachers and students from under-served communities and relatively easily (in terms of being cost-effective and not requiring substantive changes in curricula or teaching materials) through a change in 'mind set'. Moreover, our findings lend additional support to ongoing calls regarding the importance of providing teachers with regular time and support for reflection and opportunities for dialogue and development so that they feel able to grow and innovate in their practice - something that is arguably even more crucial within the current regimes of educational performativity.

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[i] The five year 'Enterprising Science' project – a research and development project conducted by King's College London, in partnership with the Science Museum, funded by BP. See www.kcl.ac.uk/enterprisingscience

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[iv] Archer et al. (under review a); Archer et al., (under review b); King & Nomikou, in press; Nomikou, Archer & King (under review).