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Policy and the standards debate: mapping changes in assessment in mathematics

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ABSTRACT

The influences on governments for policy changes in schools range across many agencies, including the political party in power. When policies change, the sources of these influences are not always clear. The project whose work is presented in this special issue examines what these changes look like in terms of the differences in assessment tasks of school pupils' mathematics, over time. In this article we attempt to develop a graph, which we argue will have general applicability internationally, that can help to reveal the sources and nature of those influences. We construct the graph in interaction with an examination of the most recent changes in two countries. We argue that our analysis is a necessary complement to the project's findings in that it enables us to identify the fields of recontextualisation, their relative strengths in terms of influence and hence conjecture their impact on the mathematics curriculum.

KEYWORDS

mathematics education; policy; curriculum

Introduction

Changes in curricula, pedagogical demands, modes of assessment and schemes of marking are effected by governments and examination bodies, which are themselves under the influence of a range of groups both official and unofficial. The ESRC funded project, The Evolution of the Discourse of School Mathematics (EDSM) has studied what school students are expected to learn in mathematics in England through the examination of GCSE assessment items across a selection of years since 1980. The project's goal is to shed light on the question of how well aligned English school mathematics is with its declared goals. In doing so, it also highlights what changes there have been in forms of assessment and language use, indicating how making comparisons in performance of school pupils over time is a much more complex process than politicians and the media seem to take into account. Our aim is to develop a graph that can enable identification of how and why the declared goals of school mathematics in any country or region change over time through identifying the agents making or influencing policy and their relationships to each other. The graph then becomes a tool for identification of how and why the declared goals of school mathematics in any country or region change over time.

We use the term 'graph', drawing to a limited extent on graph theory, as it enables us to discuss the nature of the nodes/vertices and also the different kinds of edges, directed,

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strong or weak, depending on the connections between the agents and agencies represented by the nodes.

The graph we develop in this article is drawn from Bernstein and the extension of Bernstein's work by Morgan, Tsatsaroni and Lerman (2002). We offer it as a means of investigating the ways in which the changes referred to above come about. We recognise the weak grammar of educational discourse, that is to say a discourse in which meanings of terms are weakly specified. 'Understanding' will have many meanings across educational discourses, whereas 'group structure' is unambiguously identified in the strong grammar of mathematics. Consequently, we encounter the impossibility of there being a 'right' way to teach and assess (Lerman, 2010). As will be seen in our discussion below, research findings are sometimes taken up into official guidelines and curriculum content but can then fall out, being seen as somehow harmful to the learning of children. Furthermore, in the background is the school mathematics curriculum itself, a body of knowledge determined at any time through a selection from (and inevitable change in) mathematical discourses (e.g. school mathematics as problem-solving, or modelling, or for acquiring algebraic skills, or based on other principles of selection from academic mathematics). This further places mathematics education at the whim of politicians determining policy through what can appear to be arbitrary decisions, though underlying the policy will be ideological positions, as we will attempt to demonstrate. Bernstein (e.g. 2000) makes it clear that the shift of knowledge/discourse from one context to another – recontextualisation in his terms – and indeed the pedagogic device as a whole (which determines the transmission of knowledge), is effected by and within the space created for ideology. The research community can play a part in policy in two ways: by producing research on teaching and learning that can be seen to have direct relevance to practice; and to address policy directly by examining the effects of previous changes in policy or predicting the effects of planned future changes. The standards discourse has a huge impact on children, parents and society and on the mathematics education research community – all the more reason for the EDSM project, and for our attempt here, to show how politics and policy influence curricula and assessment.

That standards are dropping is a lament shared across countries and contexts as different, for example, as the UK, an established democracy and so-called developed country, and South Africa, a developing democracy with increasing challenges confronting the post-apartheid state and its stubborn and persistent high levels of poverty and inequality. We believe that it is useful to consider these two very different contexts because of their apparently similar responses in curriculum terms to mathematics through a 'back to basics' move, but also because these similarities reflect global forces towards standardisations of curricula and forms of assessment, as we will outline below. The power and usefulness of the EDSM project methodology lies in the development of tools that are neutral with regard to time and location (where the examinations are of the standard format explored in the project) and hence enable empirically based identification of changes.

This article is a theoretical contribution to the policy debate that forms the background to the EDSM project. We have worked with Bernstein's theories, in particular in relation to this article, his theory of fields of production and of recontextualisation, and found them essential for understanding how the circulation of texts in the educational context is regulated. In Morgan, Tsatsaroni, and Lerman (2002) the graph developed from his theorisation (Figure 1) was crucial in our analysis of teachers' positioning in assessment

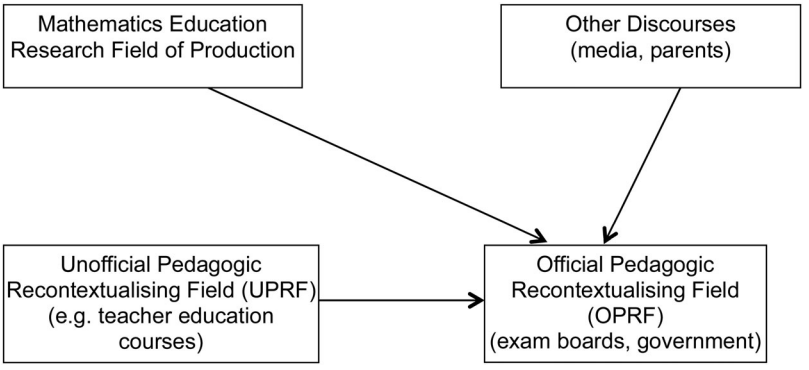

Figure 1. Recontextualising fields of mathematics classrooms (Morgan et al., 2002).

practices. Our research question here is whether an extended graph, taking into account the new powerful agents and agencies in the field, foreseen by Bernstein but not yet fully operative during his lifetime, will similarly prove critical in our current project to understand the policy influences behind curriculum, and in particular, assessment changes in school mathematics in the two contexts.

As we elaborate below, we draw on Bernstein's theory of recontextualising fields and the actions of agents and agencies, and in interaction with data – texts emerging during periods of policy change in two countries – extend the graph beyond Bernstein's framework. All the concepts drawn from Bernstein's work will be explained as they are required. As we worked on the graph, we 'tested' by asking whether it helps us understand the influences of the various agents and agencies in a way that made the motives for changes apparent. The validity of our work will depend on similar 'testing' by readers and by others who may take up the graph and examine its relevance and application in their own context. Thus the method of our study has been the unearthing of typical relevant documentation and, through intensive discussion, carrying out the two parallel stages of elaborating the graph and 'testing' for illumination of the two contexts.

We aim to develop a graph of influences that is as 'neutral' as the tools of the EDSM project and therefore as useful across other contexts. Inevitably, just as our graph has been developed in interaction with our analysis of documents in the two contexts, it is likely to look different in new locations. We are attempting to present a method of determining the agents and agencies acting in the field, and the nature of the relationships between them as represented by the directions of the edges, and it is this method that we suggest can be transferred.

In the first section of this article we will set out the analytical context drawing on Bernstein's sociological framework and other recent literature from the policy domain, and discuss the construction of the graph. We will then take one key change in national curricula in each country as empirical cases, examine a range of purposefully selected texts and allocate them to the graph, creating new categories of agents and agencies as we deem necessary. In the final part of the article we reflect on what the graph indicates regarding the conflicting discourses circulating amongst the various stakeholders in an attempt to reveal the major influences in educational change, including in particular changes in assessment.

Graphing relations between agents and agencies in the field of education

Whilst official policy emerges from government departments of education, as interesting for us is the rhetoric of the politicians whose responsibility it is to construct such policy. It is important for us to examine the extent to which they draw on unofficial discourses such as the media and parents, the discourses circulating amongst the mathematics education research community nationally and internationally, as well as unofficial fields such as teacher education courses, whose programmes are themselves regulated by official discourses (Lerman, 2014).

We present first, in Figure 1, a graph (called 'map' in that paper) from the work of Morgan, Tsatsaroni and Lerman (2002) (see also Lerman, 2012), which attempted to capture the range of influences on official policy and the relations between them in England at a particular time in relation to issues of assessment. This graph was drawn in the manner of Bernstein's (1990, p. 197) analysis of the production, reproduction and recontextualising fields[1], though in our case acting in the specific area of assessment, the focus of Morgan's (1998) study. In that paper we revisited Morgan's research in order to put Bernstein's theories to work. We concluded there:

> Whereas Morgan identified tensions between a discourse of 'investigation' and a discourse of 'assessment', we now see this tension as being between liberal progressive and traditional modes of pedagogic discourse. Thus, the map helps us describe teachers' assessment practices systematically, explaining apparent consistencies and inconsistencies. (p. 458)

We consider the graph developed in that paper to be an appropriate starting point. We will revisit the rationale for it but will then extend it to take account of relevant changes in agents and agencies in this century.

In this section we will briefly present the theoretical concepts on which we have based our work in this article and which we have developed as Figure 2. Whilst these concepts are elaborated at length by Bernstein, we can only give some key pointers here. In all cases the quotations are from Bernstein (1990).

We are working on a theory of cultural reproduction, which can be thought of as a theory "of distorted communication" (p. 170) with a goal of generating descriptions of agencies of cultural reproduction. As well as the primary context of discursive production, in which 'new' ideas are selectively created, modified, and changed, and a second context of discursive reproduction, which "refers to the selective reproduction of educational discourses" (p. 191). Bernstein distinguishes a third context: "which structures a field or subset of fields, whose positions, agents, and practices are concerned with the movement of texts/practices from the primary context of discursive production to the secondary context of discursive reproduction" (p. 192).

Bernstein goes on to say:

> The function of the positions, agents, and practices within this field and its sub-sets *(e.g. mathematics education research is a sub-field of educational research – our comment)* is to regulate the circulation of texts between the primary and secondary contexts. Accordingly we shall call the field and the sub-set structured by this context the *recontextualising fields.* (p. 192)

With these concepts Bernstein sets out the relations between agents and agencies and their classification both by purpose and by the hierarchy he proposes in the recontextualising fields. Hierarchies are evident where agents and/or agencies speak to, but do not need

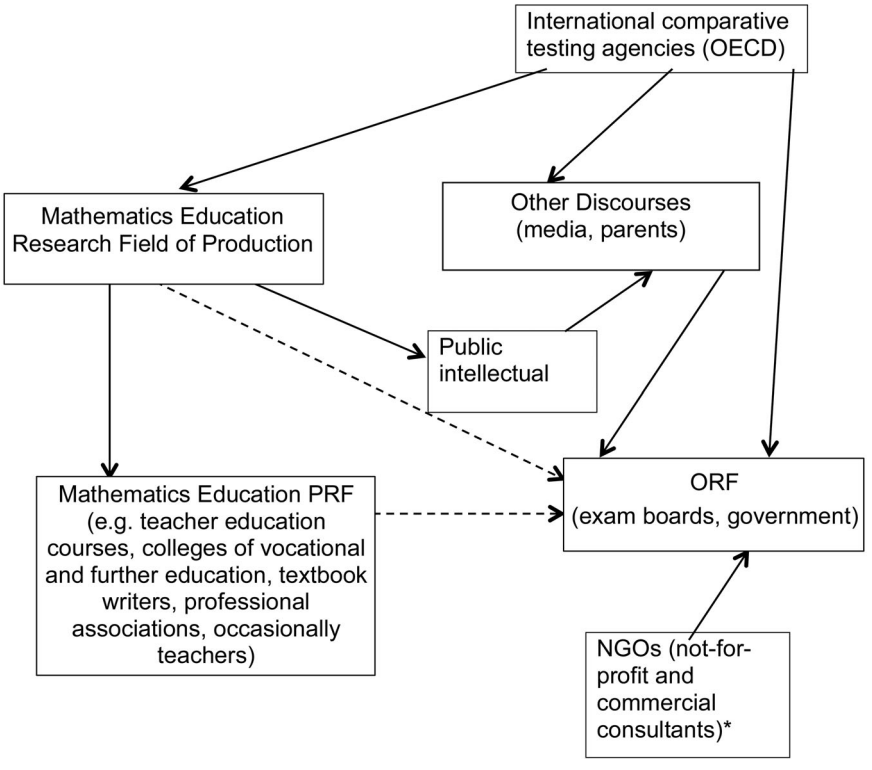

Figure 2. Revised graph of recontextualising fields of mathematics classrooms. * These take different forms and have varying influence across different sociopolitical contexts.

to listen to, other agencies. We will draw on these as we develop our graph. We are aware that a graph such as this needs to be adapted as political systems change both locally and globally, and the relationships between agents and agencies also change.

As a Field of Production, research in mathematics education appearing in journals, books and conferences presents discourses on mathematics learning and teaching. On the one hand these are recontextualised in teacher education courses, in professional journals and blogs: the Pedagogic Recontextualising Field (PRF). On the other hand, they may be taken up in the Official Pedagogic Recontextualising Field (labelled OPRF in Figure 1). Bernstein calls these PRF and ORF. We will adopt Bernstein's abbreviations in Figure 2.

As an example of hierarchy, the UK National Numeracy Strategy in 1998 adopted Dutch research in its decision to postpone teaching formal algorithms for number calculations and encourage children's flexibility in number thinking and methods (Anghileri, 2005); this became common practice in primary schools. Recent changes to the National Curriculum have transformed practice again with renewed emphasis on algorithms; thus demonstrating the control that the ORF can exert in its choices from the productions of the research field. We can say that agents acting in the Mathematics Education Research Field of Production, at least in the UK, remain outside the sphere of influence on the official field. Hence in Figure 2 the revised graph has dotted lines from this field to the PRF.

At the same time agents in the ORF are likely to be conscious of the developing discourses in the sector containing the media, parents and others, given that a major goal

of Governments is to succeed in being returned to power at the next election. Media in the UK and South Africa are widely considered to play a large part in the popularity or otherwise of political parties and hence in their electability.

Other agencies, which may have their main roots in other activities, have recently moved into the field of education, especially in the last 15 years. We will now address these changes and so make the graph more nuanced.

Recent changes in agents and agencies

In this section each change will be identified by its own sub-section.

The Pedagogic Recontextualising Field

The unofficial PRF needs elaboration, as we wish to identify some of the key elements that did not appear on the earlier graph. First are teachers. They are sometimes invited to join in consultations or participate in committees that inform policy directly and hence may have influence on the ORF. This may also be the case for teachers' unions and professional teachers' organisations. We place these agents and agencies in the PRF, following Bernstein. We retain the term 'field' where Bernstein used the term, for the Field of Production, the ORF, the PRF and the Field of Reproduction. The other 'boxes' in Figure 2 we will call spaces. We should make it clear that membership of the fields and spaces is not tightly demarcated. It may be that a teacher union has teacher educators as members, for example. Our allocation of membership is therefore a generalisation. Both the PRF and the Field of Production have dotted line connections to the ORF to indicate a weak influence. The strength of this connection will certainly vary across the world as there are some governments which regularly work with the agents in these fields.

Non-governmental organisations

There are non-governmental organisations (NGOs) active in the field too, both for profit and not-for-profit. In the UK a most significant new element is the large-scale activity of agents and, mostly for profit, agencies that tender for work from the Government in all public services. In South Africa, NGOs, largely not-for-profit, were very active during apartheid, with funding from international aid agencies as well as the South African private sector. Aid agency funds have since been directed to the post-apartheid state, necessitating a realignment of NGO work. Some of the larger NGOs were able to adapt and now obtain funding through government tenders as well as from private sector foundations.

As Ball (2009) has pointed out, the involvement of the private sector in educational research and development in the UK is substantial, many times bigger than the money invested in research in universities. The contracts on which they work impact at the very heart of schooling, including: how teachers might 'deliver' the requirements on pedagogy; and how learning can be assessed. In his paper, appearing in the ninth year of the New Labour government, one year before the general election which brought in a coalition of the Conservative and Liberal Democrat parties, Ball suggested the will to out-source work in the public sector seemed to have been flagging:

> On the other hand, the institutional outsourcing market in education in the UK is virtually moribund at present and the education businesses are pessimistic about the political will for

> future growth in this field of activity. Not all experiments in privatisation are successful or sustained. (Ball, 2009, p. 84)

That changed dramatically after the 2010 election as the more right-of-centre government sought to implement their ideologically driven agenda. For instance, the Government has made substantial progress towards its policy of taking all schools out of Government (both local and national) control as well as privatising all support services to schools in England and Wales. The status of the examination boards in England is very interesting. They are for-profit consortia involving commercial companies, including Pearson, as well as university and other educational organisations. However, there is strong government regulation of exam specifications and increasing attempts to tighten up regulation. We therefore retain the examination boards' place in the ORF in spite of their technically independent status.

In South Africa, now 20 years since the first democratic elections, government has had to confront an intractable and evidently poor performing education system that persists despite two decades of policy and curriculum reform and pro-poor state funding policies and practices. At the same time, private sector funders have had to confront poor return on substantial investment in improving education over a few decades. While the state and private sector have different roles with respect to educational policy and practice, they have realised that a co-ordination of efforts related to interventions in the system is needed. In 2014, the National Education Collaborative Trust (NECT) was set up bringing the private sector, various state education agencies, teacher unions and other stakeholders together to co-ordinate interventions in education. The major principle is that the state will match all private sector funding for the NECT, thus levering up substantial funds for non-state large scale interventions. The NECT thus straddles, to some degree, the official and unofficial fields. However, the CEO of the NECT was the CEO of an influential and successful educational NGO, while the Chairperson of the trust board was the CEO of a major bank in the country. With these as key leadership positions, the Trust is indicative of the potential and ongoing influence of the private sector in both implementing and influencing policy. In a manner similar to that described in the UK, NECT projects will call for tenders for work to be done.

These agents and agencies, having tendered for the work and being appointed, belong in a space of their own with direct access to the agents in the Official Field; hence their location on our graph.

Main ideological determinants of policy in post-apartheid South Africa are more complex: the 'transformation agenda' (undoing the damages and ravages of apartheid) creates tensions between the interests of the growing multi-racial middle class and those who continue to live in poverty. The inevitable consequence confronting the state is a public education system that is not serving the poor, with various agents highlighting the threats of deepening inequality for the country.

A particularly influential South African NGO, with an explicit pro-market framework, is the Centre for Development and Enterprise (CDE). The CDE is a think tank that commissions studies and writes reports on critical issues, not only education, in the country. Two recent reports have salience for this paper. First was a 2013 report entitled *Mathematics outcomes in South African schools: what are the facts? What should be done?* The summary comment on the front page of the report states:

> Business leaders need to incorporate an understanding of private education and other market experiments and schooling innovations in their overall perspective and priorities for intervention and reform. (CDE, 2013, p. 1)

The report concludes, as is a common feature of education discourse in the country, that a key issue in the system is the quality of mathematics teaching, advocating that teachers be rewarded for learner performance, and that:

> Business can look at ways in which experts in the private sector could provide management training for principals, and aspects of future teacher training … Looking to market forces such as introducing best practices … from the private sector [are] good places to harness market forces to help in improving South Africa's education system. (CDE, 2013 p. 13)

In 2010, the CDE published a report on low-fee private schools in South Africa, referring to these as a "hidden asset". The study reported far more such schools than acknowledged by the state, and found higher parental satisfaction and greater teacher accountability in such institutions. They conclude that:

> … a more competitive environment that provides schooling options at all fee levels can only benefit the national quest for improved education.

And recommend that:

> The main aim of future policy reforms should therefore be to build up an enabling environment in which quality schooling is expanded, regardless of whether the providers are public, private, or a combination of both. (CDE, 2010, p. 4)

A current and very successful for-profit schooling 'company' in South Africa is 'Curro' (See www.curro.co.za). Curro has set up a range of private schools across the country, offering education to different socio-economic groups. The company is growing, and as reported in the *Sunday Times* newspaper, financially is a huge success (*Sunday Times* [SA], 11 January, 2015)

Public intellectual

Singh (2015) discusses the role(s) of a public intellectual. She points out that such a position would be occupied by a scholar taking a critical stance, a notion from which Bernstein distanced himself. As we would see it, typically such a person, that is, those in the sector looking outwards, would be based in the academy and hence would be located in the Mathematics Education or general Education Research Field of Production. But she/he would in the main speak to the Other Discourses, publishing books, article and/or essays that are in the public domain and hence might influence the OPRF directly, indirectly or both. However, Lerman et al.'s study of research publications in the mathematics education community between 1990 and 2001 suggested that there was no sign of a positioning in the field of mathematics education research where the *public intellectual* would have a role to play, and thus perhaps that there is no value in recognition as such

Although it is possible now to identify some such public intellectuals (e.g. Boaler in the USA), we could not identify such people in England. In South Africa, we have found some speaking in the public domain from education in general and from mathematics education. Perhaps the most well-known public intellectual in education at a general level, and fierce critic of the new post-apartheid 'outcomes-based' curriculum (OBE),[2] is

Professor Jonathan Jansen, now vice-chancellor and principal of the University of the Free State. He has written extensively – academic papers and articles in the media – arguing practically, politically and principally "Why OBE will fail" (Jansen, 1999), in particular why the envisaged curriculum would exacerbate inequality. Three curriculum revisions have followed, vindicating to a large degree the concerns of which Jansen warned.

Currently, with international assessments and annual national testing in the country, an influential public intellectual is the economist Nic Spaull, who is frequently invited to comment across various public and intellectual fora about national results (see http://nicspaull.com/media). In January 2015 alone, his website records three media reports on the 2014 National Senior Certificate (NSC) results. His influence and that of other public intellectuals in the official field was recently given credence. In August 2014 he published a working paper and a related piece in the weekly Mail & Guardian newspaper with Professor Hamsa Venkat, a primary mathematics education professor, on their more detailed analysis of the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) 2007 data, revealing the poor levels of primary mathematics teachers' knowledge (Venkat & Spaull, 2014). The following day, the national department issued a formal response publishing it on its website, stating this was "old news" and that the article ignored state developments to address these concerns.

In England, prominent mathematics educators may be published in the education press but rarely in the press more widely. We might expect that a public intellectual would also have the ear of the Official Field, even if only because he/she is being taken up by the media, as indicated in the South African case above; hence the space we have created in our graph for the public intellectual.

International comparative testing agencies

The international comparisons enterprise has come to dominate education both in those countries that opt to participate in the Organisation for Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA) tests and those that choose not to participate. We make some comments first about the developing agenda of the OECD in relation to becoming dominant in the field internationally.

In setting out the content an edited collection which arose from a conference in 2011 Meyer and Benavot (2013, p. 9) suggest the following: "Through PISA, the OECD is poised to assume a new institutional role as arbiter of global educational governance, simultaneously acting as diagnostician, judge and policy adviser to the world's school systems."

Sellar and Lingard (2013) argue similarly:

> The rise of the OECD as an influential soft power in global education policy and global education governance is linked to the 'economization' of education and what we might see as the simultaneous 'educationizing' of economic policy, all linked to the growing significance of the skills agenda for the OECD across multiple directorates. (p. 191)

And: PISA provides a measure of human capital flows into economies. (p. 193)

It is suggested there that PISA's orientation "reflects a change in the goals and objectives of curricula themselves, which are increasingly concerned with what students can do with what they learn at school and not only with whether they have mastered specific curricular content" (p. 16). It is argued in many places (e.g. Mangez & Hilgers, 2012; Meyer &

Benavot, 2013; Ozga, 2012) that the effect of PISA is to bring about this change, rather than simply reflect what is taking place in countries within the scope of the survey.

Our concern is to locate the international comparisons enterprise on our graph. They certainly have effects on the Research Field in that sociologists take up the critique we have pointed to and mathematics education researchers take up the issues in learning and teaching that are raised by the comparisons across years of performance. We see also significant evidence of the appearance of these test results in the media. For example:

> UK [bbc.co.uk/news 3 December 2013]: The UK is falling behind global rivals in international tests taken by 15-year-olds, failing to make the top 20 in maths, reading and science. England's Education Secretary Michael Gove said since the 1990s, test performances had been "at best stagnant, at worst declining" … Mr Gove [Secretary of State for Education] told MPs that his reforms, such as changing the curriculum, school autonomy and directing financial support towards poorer pupils, were designed to prevent schools in England from "falling further behind".
>
> SA [mg.co.za/article/2012-12-11]: Results from two international assessments, Progress in International Reading Literacy Study (PIRLS) and Trends in International Mathematics and Science Study (TIMSS), released on [11 December 2012], show … overall, the performance of South African pupils in these international benchmarking assessments remain at rock bottom of the study rankings. … The basic education department said the results showed there were some improvements. "We are certainly not where we should be, but it's showing progress," [said the] deputy minister Enver Surty.

In these examples from the press we can see that agents in the ORF take up the results and we will see below the effect on the latest versions of the National Curricula in England and South Africa. Thus we place the international comparisons enterprise in a space that shows their relationship to the fields we have referred to here.

Our revised graph (Figure 2) has been developed using principles and concepts from Basil Bernstein and modified according to our knowledge of the educational contexts in South Africa and in England and Wales, but also through our research on a range of documents from various sources. We recognise that we are unable to demonstrate any kind of completeness in our analysis. It is also the case that others may look at the two contexts and propose modifications. It is certainly the case, as noted earlier, that the graph may well look different in other countries. Thus far we have attempted to demonstrate how such a graph can be constructed so that it can be produced elsewhere and critiqued.

We move now first to an analysis of curriculum change in mathematics in England and Wales before examining curriculum and current debate in South Africa. The analyses, drawn from texts circulating in the fields and spaces we have identified, test the features of the graph at the same time as exemplifying evidence of the influences they bring to the education field as a whole, and this is the purpose of the section. We hope to be presenting a complete as well as a comprehensive picture of the texts in circulation but there cannot be any guarantees.

Curriculum change in England and Wales and in South Africa

The 2014 National Curriculum for England and Wales

Eight months after the May 2010 general election, which resulted in a coalition government with the Conservative party in the substantial majority, the new Secretary of State

announced in a Government press release a review that would lead to a new National Curriculum for England and Wales with these words:

> We have sunk in international league tables and the national curriculum is substandard. Meanwhile the pace of economic and technological change is accelerating and our children are being left behind. The previous curriculum failed to prepare us for the future. We must change course. Our review will examine the best school systems in the world and give us a world-class curriculum that will help teachers, parents and children know what children should learn at what age. (Gove, 2011)

The question arises: on what was the Secretary of State's claim that children are being left behind based; whose evidence was used for the decision, or perhaps justification, to change the curriculum? There was no evidence of the need for change in the research literature. In a press release from the Department of Education on 7 December 2010 the following appeared:

> Secretary of State for Education Michael Gove said:
> Today's PISA report underlines the urgent need to reform our school system. We need to learn from the best-performing countries.
> England has continued to fall in the PISA rankings, meaning that in just nine years we have dropped from 7th to 25th in reading, 8th to 27th in mathematics and 4th to 16th in science. We have been overtaken by countries such as Poland, Iceland and Norway. This is despite England spending far more on education than comparable nations such as Germany.

This theme was taken up in the press; some examples follow:
On A blog called fullfacts there appeared (2010):

> Although spending has risen from £35.8 billion to £71 billion, the education of teenagers has failed to register any improvement and in some areas has deteriorated rapidly. In stunning proof that taxpayers did not get value for money, the UK slipped from eighth to 28th in maths, from seventh to 25th in reading and from fourth to 16th in science over the same period.

In the *Daily Mail* of 8 December 2010:

> In 2000, when 32 countries took part in the survey, the UK came 7th in reading skills – but the figures for 2009 show that out of 65 countries and regions, the UK has fallen to 25th place.

On the BBC News of 7 December 2010:

> In 2000, the year the survey began – carried out with tests in the three subjects on 15-year-olds – the UK was fourth in science, seventh in reading and eighth in maths.

In *The Independent* of 8 December 2010:

An article appeared in the education press (TES, 2012) the following year claiming that the PISA results had been misunderstood:

> The UK Statistics Authority has censured the Department for Education and Sir Michael Wilshaw – appointed by Mr Gove as Ofsted chief inspector – for using uncertain, weak and "problematic" statistics to claim that England's schools have tumbled down the global rankings.

The identification of this error has had little or no impact on policy or subsequent media discourse. We might conjecture that it does not serve the sensationalist needs of the media nor the rather antagonistic position adopted towards schools and teachers by the

government. These are examples of PISA being used to support existing policies and debates rather than as a new source of knowledge (e.g. Pons, 2012 – cited in Kanes, Tsatsaroni, & Morgan, 2014, p. 146).

Nevertheless, we can see the influence of OECD's PISA results on the Official Recontextualising Field and on Other Discourses. The Research Field of Production took up the issue too of course (e.g. Jerrim, 2011). Hence the connecting arrows to this field and the ORF.

If we now examine the new curriculum at its launch in 2014 we can look for evidence of the drivers of changes. We will take up one issue, referred to above, of the role of standard written algorithms in primary mathematics. At the same time, we will examine in a more general sense the policy context as identified by Elizabeth Truss, Minister of State for Education, in 2013.

First in relation to the international testing agencies and the perceived need to compete, Truss said the following:

> New data from TIMSS 2011 shows that England's maths performance has not improved since 2007 either at age 10 or at age 14. Put together with PISA 2009 data, it does show a worrying lack of progress – while the East Asian nations are extending their lead.

Then in relation to evidence from the research field she said:

> According to the Nuffield Foundation, we have the smallest proportion of 16- to 18-year-olds studying maths of any of the 24 countries examined: far less than nations like France, the US, Ireland, New Zealand, Russia, Australia, Estonia, Spain, Germany or China. 85 per cent of Japanese students are studying the equivalent of A Level maths – in England it's just 12 per cent of young people.

Referring to another study, from Kings College, examining universal participation in post-16 mathematics, she said:

> It found that one of the most important factors in determining whether or not young people continue with maths after 16 is prior attainment. In other words, if we get maths teaching right from the start of primary right through to GCSE, more young people will finish GCSE feeling confident and comfortable in maths – and participation after 16 will naturally increase.

In terms of changes, justified by these two appeals, to TIMSS and PISA and to research, Truss said the following:

> Another essential reform to the primary curriculum is to ensure that all pupils are taught efficient calculation methods – rather than spending too much time on confusing, time-consuming methods like chunking and gridding.
> These tortured techniques have been the trend in recent years. Instead of simple, efficient columnar long multiplication and division, children have been taught to rely on intermediate methods, splitting numbers into smaller chunks and parts, working them out separately and repeatedly adding numbers together, or taking them away.
> Supporters of these methods say that they are useful in helping children to understand the concept behind the calculation. But all these methods are slow and simplistic, only effective on the most basic sums.
> Parents are often utterly baffled, and complain that they have no idea how to help children with their homework.

Here we can see the evidence of the range of fields and spaces in Figure 2, at least in terms of how the Official Field chooses to interpret those messages. The effect of work in the Research Field is specifically evidenced in relation to children's informal methods, though in this case the research evidence is rejected, being called tortured, slow and simplistic, and untried. The Unofficial Field is represented by 'supporters of these methods', which though unspecified is likely to include teachers and teacher educators. The Other Discourses are present in the reference to parents. The International Comparison agencies are referred to directly. There is, however, little evidence of a Public intellectual, a person from the Research Field who has the status to be heard beyond the education community.

The analysis could go on. We believe our graph has enabled us to locate the various influences and reveal their impact on policy. Given the pendulum swing of education policy that can be traced over decades and changes in governments we can expect that a similar analysis in some years' time might see a swing back to research that has currently been rejected and we could use the graph to trace such moves.

We now move to our second example, from debates on back to basics, a theme that hovers in the background of the changes in the 2014 mathematics curriculum for England and Wales, but is in the foreground in South Africa.

The 2011 Curriculum and Assessment Policy Statements, South Africa

Immediately following the May 2009 national elections in South Africa, the new Minister of Education, Angie Motshekga, announced government intentions for 'streamlining' the curriculum, cutting 'frills', and 'getting back to basics'. The minister's contribution to the debate in the National Assembly following the state of the nation address a few days before was reported as follows:

> Basic Education Minister Angie Motshekga on Friday vowed to cut the "frills" out of outcomes based education (OBE) and get back to teaching the basics in public schools. "We must go back to basics … we have to make sure that our learners can read, write and count as a bottom line," she said. … Motshekga was responding to concerns raised by MPs about the public school curriculum. … Motshekga suggested a more pragmatic approach to OBE is on the way. "The noble principles of outcome based education cannot be wished away; they still remain great and noble. Our children, indeed, as future citizens, need to be equipped with skills that enable them to be well-rounded adults, who can solve problems, think laterally, … come 2010 we'll be working on a streamlined curriculum that will make sure that we have clear outcomes without any frills", she said. (IOL News Online, 5 June 2009)

This statement followed widespread concern with the existing curriculum, and its outcomes-based approach in the country. As in the case of Truss in the UK, the minister is aware of the contestation in the field of production about OBE and offers soothing words with respect to problem-solving and rounded citizens, for example, but emphasises her back-to-basics move.

In the same debate, reporting further on the national curriculum review she set up in the same year, Minister Motshekga said:

> The major issue that has been affecting us is about international testing of literacy and numeracy. We are going to be implementing the Foundations for Learning Programme from 2010. The programme establishes the non-negotiables of resources, teacher planning

> and effective teaching. The focus is on reading, writing and mental Maths each day, and on regular standardized assessments of learner performance. The Department of Basic Education has developed extensive learning and teaching packages for Grade R to 6 teachers to assist with planning teaching and learning. These packs will be distributed to all primary schools at the start of the year in 2010. (Hansard [unrevised], November 5 2009)

The impact of international comparative assessment on the curriculum and policy itself is interestingly different from the UK. The results focusing on South Africa being "rock bottom" galvanised the state into focused attention across the curriculum grades, but also produced some distancing from the international comparisons by initiating Annual National Assessments as an appropriate benchmark and measure of progress. At the same time this saw the onset of far greater prescription for teaching, as was made clear in the statement made by Minister Motshekga on the progress of the review of the National Curriculum

- The National Curriculum Statement is being strengthened in order to improve the quality of teaching and learning in our schools.
- The National Curriculum will focus on the content that must be taught per term and the required number and type of assessment tasks each term for each subject. This will ensure that all teachers and learners have a clear understanding of the topics that must be covered in each subject. (Issued by the Ministry of Basic Education 06 July 2010)

In what follows, we trace some of the antecedents to this policy and curriculum shift, to illuminate how various agents influence the Official Field.

The most explicit influence was the research report of the Task Team set up by the Minister to review the implementation of the National Curriculum Statement. The team comprised two leading education researchers, two persons from teacher unions and professional associations, one from a statutory body linked to the national department, and, interestingly, one from a key publishing company. Again we see a blurring of the official and unofficial as agents of influence in the field. The committee reported in October 2009, stating (p. 38):

> Large scale, international studies of curriculum (such as TIMMS) indicate some of the features of the formal curriculum which are associated with higher performing countries in internationally standardized tests. These include adopting a strong, discipline based approach to school subjects; providing clear, specific, easily understood and measurable curriculum documents linked to textbooks; and providing curriculum statements that specify content at specific year levels, showing conceptual progression over time. The review of Curriculum 2005 identified a number of these issues in criticizing Curriculum 2005, indicating the importance of conceptual coherence; content specification; and sequence and progression in the curriculum. (DBE, 2009)

What is interesting in this review comment is that the increasing specification of the curriculum is aligned with a stronger, disciplinary, conceptual coherence and progression, rather than the narrow conception of the "no frills" and "back-to-basics" call by the Minister, thus reflecting the influence of the Field of Production.[3]

Calls for greater specification and prescription in the curriculum came much earlier from the NGO sector, and are close to the Minister's statements. Based on a 10-year

review (1996–2006) of NGO interventions in mathematics and science education in the country, the Zenex foundation argued for the need to:

> Offer more tightly-scripted programmes. … These programmes would tailor training to emphasise curriculum coverage and increase learners' opportunity to learn through more regular, structured written work. These programmes would also offer teachers structured work plans that, if adhered to, would cover the year's work. (Zenex, 2010)

In 2011, new guides for implementing the curriculum, in the form of the Curriculum and Assessment Policy Statements (CAPS), were finalised and were phased in at various grades between 2012 and 2014. The 2013 report of the national department referred to CAPS as follows:

> The CAPS can be viewed as part of an overall thrust to "go back to basics" that has characterised the term of the current Minister of Basic Education [Angie Motshekga], and to some extent her predecessor [Naledi Pandor]. Other components of this "back to basics" approach include a focus on basic literacy and numeracy in the early grades, the provision of new workbooks [containing lessons for every week of the year with space for learners to complete exercises] and the introduction of the Annual National Assessments (ANA). (DBE, 2013)

To summarise the above, in looking at the rationale and responses of the turn to basics we can see awareness of the significance of the international comparison agencies in Minister Motshekga's comments in the National Assembly. The Zenex Review indicates the influence of NGOs in the process. The Curriculum Review Committee's membership is interesting in that it is drawn largely from the PRF and yet has been set up by the ORF and its advice is taken up. This speaks to the issue of *boundaries* between the categories of agents and agencies on the graph we have developed. In the UK the link between the PRF and the ORF is weak at best but in South Africa, and some other countries too, this is not the case; teachers' and researchers' knowledge and experience appear to be acknowledged. Appearances may be deceptive however. We will return to the issue of boundaries in relation to the PRF and ORF below.

As we discussed earlier, evidence of the existence, influence and, we might add, importance of public intellectuals in the educational policy arena is seen in comments from Metcalfe to CAPS but also from agents and agencies in the PRF. The shifting role of public intellectuals has recently attracted attention in the Field of Production (e.g. Goodson, 2014).

Finally, the contradiction between the back to basics turn and the values clearly held by Minister Motshekga in regard to OBE is would be very interesting to consider in future research.

Discussion and conclusion

Identifying the effects and pressures on policy makers in education is not easy, given that government departments of education set their rationales for changes in rhetoric that appeals to the audiences that are seen as potential supporters, be they voters, media leaders, unions or business leaders. In this article we have argued that the development of a graph charting the relations between agents and agencies can help to reveal the sources of these various pressures and how they might impact on policy. Having surveyed the field we extended a graph presented in Morgan et al. (2002) to reflect the entry of other

agents and agencies in new positions of potential influence. We demonstrated the use of that graph, seen as a set of tools, through examining recent changes in educational policy in the UK (more precisely England and Wales) and in South Africa. We believe that identifying where sources of influence can be found and observing their place on the graph enables an oppositional discourse, a way of engaging with the ORF from an alternative viewpoint.

We have intentionally not focused specifically on assessment but have referred constantly to it in reviewing documents and policy statements. The broader context of influences on educational change has been the motive of this paper. All aspects of the distribution of symbolic power through the pedagogic device are condensed into evaluation/ assessment (Bernstein, 2000) and hence it is always at the heart of our concerns.

An important issue that was referred to above is that of boundaries between the agents and agencies identified in the nodes of Figure 2, in particular the boundary between the PRF and the ORF. The post-apartheid South African curriculum context is interesting in terms of who has been recruited onto ministerial committees to research, review and advise government. Educational researchers have played key roles in these committees, and then, of course one must ask: which researchers are these, and what has been their relationship with the ORF? And so we move into more complex territory and beyond our scope here. We end with this challenge to all educational researchers and with the question of how we position ourselves with respect to the ORF. Is it our role to ensure that the dissemination of results of research such as EDSM are heard by government and policymakers? Should we play the role of public intellectuals, and if so how? And if we don't, who will?

Notes

1. "Bernstein's concept of field is similar to that proposed by Bourdieu (1992, p. 17); namely, a social space of conflict and competition, an arena 'in which participants vie to establish monopoly over the species of capital effective in it … and the power to decree the hierarchy and 'conversion rates' between all forms of authority in the field of power'. In the course of struggles, the very shape and social divisions of the field becomes a central stake, because alterations to the relative worth and distribution of resources equate to modifications of the structure of the field (i.e. the social division of labour and the social relations within the field)" (Singh, 2002, p. 573).
2. Outcomes-Based Education (OBE) was the overarching 'theory' on which post-apartheid curriculum policy was based. In broad terms OBE curricula are organized around outcomes (goals), with little specification of the content and methods to achieve these.
3. It is worth pointing our here that at least one of the educational researchers on the review committee draws on Basil Bernstein's sociology and is particularly concerned with weakly classified and framed curricula and the effects on inequality.

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