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# Using Bernstein to analyse primary maths teachers' positions and identities in the context of national standardised assessment: the case of the ANAs

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## Abstract

This paper is informed by Bernstein's notion of pedagogic identity and Morgan's (Morgan, 1998, Morgan, Tsatsaroni and Lerman, 2002) study of mathematics teachers' orientations in assessment practice. These are used to identify primary maths teachers' positions and identities in the current South African education context characterised by an emphasis on monitoring through standardised national learner tests. The paper draws on data obtained from interactive interviews with nine sampled primary maths teachers who were participants in a numeracy in-service education community of practice. Using Bernstein's four pedagogic identity classes and relating these to Morgan's maths teachers' orientations we identify primary maths positions being taken up by the sampled teachers in relation to the Annual National Assessment (ANA) tests. The research indicates that most of the primary maths teachers' say that their practices are being influenced by the ANAs, although in different ways. We finally propose that primary maths teachers need to develop ways to 'critically align' their practices to national policies so as to maintain some agency while aligning with policy.

## Introduction

This paper brings to the fore the notion of primary maths teachers' practicing identities within the current South African education context characterised by the national testing of learners in primary school. We take particular interest in how educators respond to and align their teaching practices in relation to the Annual National Assessment maths tests (commonly referred to as ANAs). "ANA is a testing programme that requires all schools in the country to conduct the same grade-specific Language and Mathematics tests for Grades 1 to 6 and Grade 9" (Department of Basic Education (DBE), 2012, p.2). Employing Bernstein's notion of pedagogic identities supplemented with Morgan's model on positions taken by United Kingdom (UK) maths teachers

(when they assess students' coursework) (Morgan, 1998, Morgan *et al.*, 2002) as analytical tools we explain positions and identities being taken up by the teachers sampled in this study. In this paper we analyse the teacher participants' responses to questions related to the ANAs as part of longer interactive teacher interviews. We categorise the primary maths teacher positions and identities as either being; Neo-Conservative, Therapeutic, Instrumental-Examiner or Teacher-Adviser (Bernstein, 2000, Morgan, 1998, Morgan *et al.*, 2002).

The interactive interviews with the teachers were part of a broader doctoral research study of the first author. We sampled nine teachers out of 53 teachers who were participants in a maths in-service professional learning community conceptualised by the South African Numeracy Chair (the second author) at Rhodes University in Grahamstown. The nine selected teachers actively participated in and frequently attended the Numeracy Inquiry Community of Leader Educators (NICLE) sessions throughout 2011. Additionally these teachers were willing to be part of the first author's longitudinal research study. This paper focuses and presents data gleaned from two interview questions which read, '*What is your opinion on the Annual National Assessment tests? Have they influenced your teaching at all?*' The responses from these questions indicate that most of the sampled teachers are influenced by the ANA tests, however the degree and extent of the influence differs.

The ANA tests were introduced by the Minister of Education in 2008 when she launched the Foundations for Learning Campaign which aimed at improving the average learner performance in literacy and numeracy to 60% by 2014 (Department of Education (DOE), 2008). Furthermore the campaign was motivated by South African learners' poor performance in regional and international tests. Under the new national monitoring measures put in place by the Department of Education all South African primary learners undergo Annual National Assessments in Numeracy and Literacy using standardised tests to monitor their literacy and numeracy levels. The first ANA national results made public in the second half of 2011, have revealed that the Grade 3 and the Grade 6 Maths national mean score stands at 28% and 30% respectively (DOE, 2011). The 2012 report shows 41% and 27% respectively (DBE, 2012). South Africa has also introduced a repackaged curriculum, CAPS (Curriculum and Assessment Policy Statement), which was introduced in the Foundation phase last year (2012) and is to be fully implemented in the

Senior Phase by 2014. This new curriculum took heed of the criticisms levelled against the National Curriculum Statement, thus the CAPS curriculum is time-paced, specifies content, knowledge and skills to be taught, and provides explicit sequencing and pacing (DOE, 2011). Locally Parker (2006) and Graven (2002), drawing on Bernstein have argued that curriculum policies and educational reforms provide South African mathematics teachers with new official pedagogic identities. Bernstein used the concept of pedagogic identity to analyse contemporary curriculum reforms in Britain, from the mid-1980s (Bernstein, 2000). The UK curriculum changes, initiated under the 1988 Education Reform Act saw from 1991 the administration of compulsory testing (National curriculum assessment) of 7, 11, 14 and 16-year-old learners using Standard Assessment Tasks (SATs) in Mathematics, English and Science subjects (Whetton, 2009). South Africa has and continues to experience major post-apartheid education change which is more recently becoming driven by national learner assessments similar to the national standardised testing, experienced in the UK in the 1990s (Bernstein, 2000). In this regard Bernstein's work becomes relevant for this study which investigates the sampled primary maths teaching identities and positions in relation to the onslaught of the recently introduced national assessment regime in the form of the rollout of the ANA tests.

## Literature review and theoretical framing

Many studies employ the concept of identity to explain secondary school maths teacher identities within education reform contexts (Lasky, 2005, Parker, 2006, Graven, 2002, Morgan *et al.*, 2002). Particularly relevant to this paper is Morgan's study of positions adopted by UK maths teachers as they assessed students' coursework although their study did not specifically focus on primary maths teachers (Morgan, 1998, Morgan, Tsatsaroni and Lerman, 2002). Some studies have investigated *primary* maths teacher identity formation in teacher education (Davis, Adler and Parker, 2007, Jaworski, 2003, Hodgen and Askew, 2007, Graven, 2002 and 2003, Walls, 2008). Of the cited examples Davis *et al.*, (2007), Graven (2002), Morgan *et al.* (2002) and Parker's (2006) work on maths teacher identity have been informed by Bernstein's theory. Closely related to our study but from a Foucauldian theoretical perspective is Walls' (2008) paper which discusses how Australian primary maths teacher identities are 'produced' within standardised test

processes. Our study contributes to this field of exploring the relationship between teacher identity and national testing regimes informed by Bernstein's construct of pedagogic identity and specifically investigates South African primary maths teacher identities in relation to national testing.

In the UK the revision of the National Curriculum, which began in 1988, resulted in the growing significance of course-work assessment, national mass testing, the implementation of cross-curricular themes and a shift from collection (visible/explicit pedagogy) to integrated curriculum codes (invisible/implicit pedagogy) with weak classification and weak framing (Bernstein, 2000, 1995, Bernstein and Solomon, 1999, Sadovnik, 1995, Morgan *et al.*, 2002). Britain's education reforms influenced the classification, framing, sequencing, pacing and evaluation of educational knowledge and shaped and distributed teacher and learner consciousness and identity (Bernstein, 1975, Bernstein and Solomon, 1999, Sadovnik, 1995). Secondly Britain's curricular reforms were marked by tight quality control, monitoring and public evaluation over both inputs and outputs/outcomes of education (Bernstein, 2000). From this perspective, Bernstein (1999, p.259) argues that the "centralised setting of criteria and the central assessment of outputs" are the State's "new forms of centralised regulation". Thus, from a political viewpoint, national mass standardised testing regulates education making the schooling system accountable, transparent and efficient (Tyler, 1999, Whetton, 2009). Whilst mass learner assessment is one practical and feasible way of monitoring education outcomes and the efficiency of the education system it also simultaneously projects a particular national teacher identity and the effects of the take-up or rejection of this promoted identity may or may not support the efficiency of education in the classroom.

Central to Bernstein's pedagogic identity model (Bernstein, 2000, Bernstein and Solomon, 1999) is the argument that the official knowledge or different pedagogic modalities of curriculum reforms initiated by the state and distributed in educational institutions construct, embed and project different official pedagogic identities. Bernstein defines pedagogic identity as composing of "a social and a career base", with the social base being controlled and regulated by the State through the "official pedagogic modalities" (official regulation and practices) and giving rise to "official projected pedagogic identities" (Bernstein and Solomon, 1999, p.269 and Bernstein, 2000, p.62). In contrast a "career" base is "moral, knowledged and locational" and gives emergence to "local identities" (Bernstein and Solomon,

1999, p.269 and Bernstein, 2000). This aspect of identity and its construction is external to the official arena (Bernstein, 2000). However an interesting feature of Bernstein's pedagogic identity concept is that he uses the same model with similar positions for both the official pedagogic identities (social base) and the emerging local identity field (career base), the latter involves the teacher's own individual and personal beliefs and practices. This gives us the space to investigate and thus explore the inter connectedness of primary maths teachers' pedagogic identities and positions. Bernstein (2000, p.204) also emphasised that the "form and modality of pedagogic identity are an outcome of the classificatory relations and . . .the strength of the framing". In this regard official pedagogic identities are the outcomes of classification and framing properties, thus a function of the principles of social order aligned with the state.

Bernstein (2000, p.66) identified "an official arena of four positions for projecting of pedagogic identities", namely Conservative, Neo-Conservative, Therapeutic and Market. The Conservative and Neo-Conservative positions Bernstein (2000, p.66) calls centred pedagogic identities and these "are generated by resources/discourses managed by the State" and "focus upon the past". On the other hand the Therapeutic and Market categories are generated "from local contexts or local discourses. . . where the institutions concerned have some autonomy over their resources" and "focus upon the present". In our study Bernstein's model of pedagogic identities becomes important in analysing local primary maths teacher identities within educational reform contexts marked by standardised ANA tests. Thus we draw on Bernstein to investigate the official primary maths teacher identities constructed in the official arena as projected by the macro structures and then explore local take-up. For purposes of clarity in teaching orientations we also refer to Morgan's maths teacher positions which relate specifically to assessment (Morgan, 1998, Morgan *et al.*, 2002). Morgan *et al.*'s, (2002) study examined Bernstein's description of the performance and competence models and their modes. They recontextualised these to explain positions taken up by Britain's Secondary school teachers when assessing learners' mathematical coursework tasks. The idea of 'positioning' (Morgan, 1998) is important for this study as it takes into account the individual teacher practices and their beliefs or feelings about primary maths teaching and standardised testing. Morgan *et al.*'s (2002) work becomes particularly relevant for our study as it provides us with a framework for understanding mathematics teacher assessment practices

drawing on the work of Bernstein. Both Bernstein (2000) and Morgan *et al.*'s (2002) studies show how pedagogic identity is produced through pedagogic discourses and pedagogic models.

This paper discusses four of the initial eight teacher positions identified by Morgan (1998) namely: Examiner-using externally determined criteria, Examiner-using own criteria, Teacher-advocate, Teacher-adviser, Teacher-pedagogue, Imaginary naive reader, Interested mathematician and Interviewee. The four positions of relevance to this paper are: Examiner-using externally determined criteria, Interested mathematician, Teacher-pedagogue, and Teacher-Advocate (Morgan, 1998, Morgan *et al.*, 2002), and we relate these to Bernstein's (2000) four pedagogic identity classes. It is this close relationship and link between Bernstein's pedagogic identity categories and Morgan's maths teacher positions that allows us to investigate both the primary maths teacher's pedagogic identities and their positions in the context of the newly introduced national ANA testing. In the discussion section we elaborate on the Teacher-adviser position (Morgan *et al.*, 2002) which combines and contains features of Bernstein's (2000) Neo-Conservative and Therapeutic pedagogic identities and is illustrated by one of the sampled teacher participants. Table 1 below indicates the interconnectedness of Bernstein's pedagogic identity categories and Morgan's maths teacher positions which we have identified as useful for exploration of primary maths teacher identities in relation to the ANAs.

**Table 1: The inter-connectedness of Bernstein's pedagogic identity classes and Morgan's maths teacher positions**

Bernstein's pedagogic identity classes	Morgan maths teachers' positions
Conservative	<i>Interested mathematician</i>
Neo-conservative	<i>Teacher-pedagogue</i>
Therapeutic	<i>Teacher-advocate</i>
Instrumental/market	<i>Examiner – using externally determined criteria</i>

Bernstein (1995, 2000) classified Conservative Pedagogic identities as those teacher positions generated and shaped by national resources or discourses (the collective social base) and ‘grand narratives of the past’ which provide exemplars, criteria, belonging and coherence. Conservative teacher identities are “formed by hierarchically ordered, strongly bounded, explicitly stratified and sequenced discourse and practices” (Bernstein, 2000, p.67). In this category of identity there is tight control over the content of education but not over its outputs. This teacher identity category relates to what Morgan (1998) calls an *Interested mathematician* position which emphasises the understanding of the mathematical content subject matter. This teacher position makes sense of and is curious about mathematics (Morgan, 1998).

Neo-Conservative Pedagogic identities are “formed by recontextualising selected (and appropriate) features from the past to stabilise and facilitate engaging with contemporary change” (Bernstein, 2000, p.68, Bernstein, 1995, p.410). This ‘new fusion’ of identity, according to Bernstein foregrounds the career base (individualised construction) with an emphasis upon performance and takes heed of social relations. Implicit in this emerging identity is “the beginning of a change in the moral imagination” of the teacher (Bernstein, 2000, p.77). This teacher identity category corresponds with Morgan’s (1998, p.135) *Teacher-pedagogue* maths teacher position which mainly suggests “ways in which a student might improve her perceived level of mathematical competence”. Teachers in this position are both in a pedagogical relationship with their learners so as to further their mathematical learning and also ensure that each student achieves as highly as possible on external examinations (Morgan, 1998). In this paper we discuss how four of the nine teachers sampled in this study had taken this position in relation to the introduction of the ANAs.

Therapeutic pedagogic identities are “produced by complex theories of personal, cognitive and social development, often labelled progressive” (Bernstein, 2000, p.68). The therapeutic position projects autonomous, sense-making, integrated modes of knowing and adaptable co-operative social practices that create internal coherence. However such a pedagogic identity according to Bernstein (2000, p.69) “is very costly to produce and the output is not easily measurable”, furthermore “it is projected weakly, if at all” in “contemporary arenas”. The transmission which produces this identity goes against specialised categories of discourse and prefers weak knowledge

boundaries (Bernstein, 2000). The therapeutic pedagogic identity closely relates to the *Teacher-advocate* position which is characterised by educators orientated towards students, who draw on what is present with reference to the student, speak the alternative discourse and explicitly reject the official criteria. This paper will exemplify how one of the sampled participants, Belinda, positioned herself in this category.

Lastly Bernstein (2000) identified the ‘Neo-liberal, Market or Instrumental pedagogic identities’ teacher category which is characterised by autonomy, with a focus on producing competitive output-products that have an exchange value in a market and constructing an outwardly responsive identity driven by external contingencies rather than one driven by dedication. Bernstein’s Instrumental pedagogic identity is similar to the, *Examiner: using externally determined criteria* teacher position identified by Morgan, thus we have chosen to call this teacher pedagogic orientation ‘Instrumental-Examiner’. Because this teacher position speaks the voice of the legitimate discourse, it is orientated towards the text and draws on what is absent from the student’s text (Morgan *et al.*, 2002). One key and outstanding feature of this teacher position highlighted by Bernstein (2000) and reported by Morgan *et al.* (2002, p.456) is that this category “explicitly refers to the official criteria”. Three of the teacher participants in this study exemplify this teacher identity and position category.

## Research methodology

In carrying out this research we are using what Merriam (2001) calls educational ethnography. Whilst the broader PhD study of the first author, uses participant observation, interactive interviews and reflective journals to gather data, this paper only draws on the data obtained from interactive interviews carried out in November and December 2011. The data presented here was gleaned from two sub-questions from the interactive interview question 11, which read, ‘*What is your opinion on the Annual National Assessment tests? Have they influenced your teaching at all?*’ To provide a rich thick description of the primary maths teachers’ practising identities we also present data from the teachers’ utterances in relation to their maths teaching identities in the context of the ANAs across a range of other interview questions. These interviews were conducted by the first author with



nine selected primary maths teachers participating in NICLE. A semi-structured interview schedule with open-ended questions was used with the average time for each interview being about an hour. All interviews were conducted at the respondent's school and were audio-recorded and fully transcribed.

The nine teachers drawn from NICLE were selected through a combination of purposive and stratified sampling strategies. We intentionally selected teachers who frequently attended NICLE sessions and those teachers who were willing to be part of this longitudinal research journey. Teachers in the sample are from four different types of schools in the South African education system. Three are from a farm school, two are from a township school, two are from historically Coloured schools in a historically coloured area and two are from an ex model C preparatory school in a formerly white area. In this sample of teachers three are Intermediate Phase teachers, two are multi-grade teachers of grades 2–3 and grades 4–5, and the other four are Foundation Phase teachers. Notably all Foundation Phase teachers in the sample are female. (This is also the case for the larger group of NICLE teachers – that is, all Foundation Phase teachers in NICLE are female while there are several male teachers in the Intermediate Phase). For this reason the sample has more female than male teachers.

**Table 2: Sample teachers background information**

School type	Teacher's pseudonym	Gender	Phase and Grade(s) taught	Teaching years experience	Highest qualification attained
Farm school with some multigrade classes	Belinda	F	FP – 1	6	Montessori Diploma
	Swallow	F	FP – 2/3	14	B.Ed. (Primary)
	Evelyn	F	IP – 4/5	20	B.Ed. (Secondary)
Ex model C school in a historically white area	Melania	F	FP – 3	11	Higher Diploma in Education
	Ruth	F	FP – 3	27	B.Ed. (Honours)
African township school	Pamela	F	FP – 3	17	Further Diploma in Education
	Calvin	M	IP – 6	25	B.Ed. (Primary Maths)
Historically coloured combined primary and secondary school in a historically coloured area	Edna	F	FP – 0	6	Matric  Final Year – National Primary Diploma in Education
Historically coloured primary school in a historically coloured area	Robert	M	IP – 4–7	19	B.Ed. Honours in Maths Education  Currently studying for a Masters in Maths Education

A deductive data analysis approach that is theory-driven was used to analyse our data. Thus the coding and exploration of data was theoretically guided by Bernstein's model of pedagogic identity and Morgan's maths teacher

positions in discourses of assessment. Bernstein's concept of pedagogic identity and Morgan's maths teacher positions provides analytic tools that enable us to position the sampled participants according to their interview responses and also provides a language to describe and explain the local primary maths teachers' identities and positions in the midst of the newly introduced national testing.

## Discussion: Primary maths teacher practicing identities in relation to ANA tests

In this part of the paper we present one part of our research findings interpreted through the lens of Bernstein's pedagogic identity theoretical framework, supplemented with insights from Morgan's maths teacher positions as discussed above. We interpret the teachers' responses and positions on the ANAs and how according to teachers' these have influenced their teaching. We discuss how the sampled teacher participants' articulations resonated with the Neo-conservative, Instrumental-Examiner and Therapeutic teacher identity positions. We did not find any teacher whose position and identity resonated with the Conservative teacher identity category. In our analysis we grappled with identifying a pedagogic category that related to Pamela, however her position relates well to Morgan's Teacher-adviser position which combines features of both Neo-Conservative and Therapeutic pedagogic identity categories.

Neo-conservatives (teacher-pedagogue): Calvin, Robert, Ruth and Melania

Four of the nine teachers indicated experiencing some tension in relation to the dual need to be test-focused and at the same time teach for 'maths learning'. The teachers in this identity category felt that the ANA tests influenced the manner in which they taught maths, however they gave different reasons for this influence. For both Melania and Calvin the ANA tests had influenced their teaching, linguistically and evaluatively, and made Melania 'realise how they are asking the questions and I try to use the same type of language when I am working with numbers'. Similarly Calvin was

now ‘concentrat(ing) on exam papers and how they are asking the questions and I try, when I do my tests I try to ask my questions in the ANAs way’. Yet for Ruth ANA maths tests had made her recognise the need to refocus her teaching and to get the learners to: ‘understand the system, because they are being assessed in a certain system and they need to be familiar with it. . .they need a lot of revision and exposure to the format of the tests. . .they need all those things that formal assessment require’.

Robert felt the need in his maths teaching ‘to keep in mind’ the ANAs as to him these tests were a ‘good way of setting a benchmark. . .of setting external papers’.

Whilst these teachers all felt the need to ‘keep an eye’ on the ANA tests to inform their practice they had some reservations and critique on the administrative technicalities, standards and the validity of the ANA tests. For example Melania was of the opinion that school results could be ‘inflated’ as the test ‘papers are marked by the teachers themselves’. This point was also raised by Robert when he argued that the ANA papers ‘should be marked externally’. Robert, Melania and Ruth felt that some of the instructions and language used in the exam papers were not easily accessible to learners (as written language is hard for some learners) – Ruth suggested the need for some of the tests to be administered through ‘an oral test’. Both Robert and Calvin felt that ANAs exerted unnecessary pressure on the teachers to finish the syllabus. This is succinctly captured by Calvin when he says, ‘so you are pressurised as a teacher to make sure that you finish the syllabus’. The inadequacy of ANA, in terms of the range of content assessed, raised later in the paper by Pamela was also noted by Robert, who argued that ‘ANA doesn’t cover all different things’.

Because of the stated limitations of the ANAs this category of teachers felt morally obliged to additionally teach the learners ‘to understand the topic’ (Ruth). Similarly Melania, a colleague whom Ruth taught with at the same school, felt the need to teach learners to understand the maths and not merely to do well in the tests. She said, ‘children are not used to doing tests. . .because that’s not the way it is in the normal classroom routine’. Calvin’s response to whether the ANAs influenced his teaching, highlighted the need for maths teachers to ensure that learners understand the basic mathematical concepts and not to rush through the syllabus. He said, the ANA

influences the way you try to make sure that a learner understands. You can say I don't care if I don't finish with my syllabus. The kid understands what he learnt so that in the next year he will be able, he has the basic knowledge for those things.

Whilst Robert took a similar stance to that of Calvin he felt the need to be 'critical' in his maths teaching practices as he elaborated that:

I have realised you can't just be. . .blindly lead. . ., sometimes you take leadership within mathematics and manage your teaching and know when to scale down and when to give an overview, and let learners see and do it and perhaps focus on those concepts that are seen as difficult to teach and learners to learn like, eh, volume, area, circumference'.

The Neo-conservative teachers in this category thus express the need to both improve the learners 'performance' in the ANAs thus 'engaging with the contemporary change' in the local education policy yet on the other hand taking heed of their traditional 'moral' obligation of ensuring primary learners additionally understand the 'maths' and the full range of work. These teachers' practices in relation to the ANAs resonate with Morgan's (1998) *Teacher-pedagogue* position under which teachers acknowledge the dual responsibility of furthering the student's mathematical thinking as well as ensuring that students achieve as high as possible on external examinations.

#### Instrumental - Examiner: Swallow, Edna and Evelyn

Three of the nine teachers, Swallow, Edna and Evelyn shared a common teaching and learning orientation in relation to ANAs. They all felt that the ANAs were 'good' and influenced their teaching practices positively. These teachers explained how their maths teaching practices had been tailored to suit the ANA tests. For example Evelyn would 'expose' the learners to '(ANA) problems put in a different way. . .'. Swallow showed how in her maths classes she would 'revise' and 'reinforce' a 'particular concept' if the learners were 'battling' with it in the tests. Yet for Edna it was a matter of constantly checking how her maths teaching aligned with the ANA tests as she said, 'seeing that the ANA will come in, you can always go back to the ANAs and see if I am on the right track and if I give my learners proper opportunities'. In a way these teachers' practices were being adapted to align to the ANAs and their practices can be seen as incorporating 'teaching to the test'. Additionally there is an implied uncritical acceptance of the validity of

the ANAs in relation to assessing the work teachers are doing against an external notion of the right track. This Examiners category of teachers explicitly involves reference to the official criteria (Morgan et al, 2002). Through their allegiance to the ANAs the three teachers can be considered, according to Bernstein (2000), to be constructing an outwardly responsive identity driven by external contingencies (ANAs) rather than one driven by inner dedication towards making learners understand maths. Bernstein (2000, p.71, 68) ironically calls this new orientation in education “the pedagogic schizoid position” because of its “emphasis upon performance” rather than focusing upon learners’ understanding of disciplinary knowledge.

Looking now towards the reasons why the teachers in this category felt that it was good to be influenced by the ANA tests in their maths teaching practices, Swallow explained that they:

are quite a good benchmark for me. . . a good indication of how much my children have done, and how much they need to know, and if they have achieved the goals that they need to achieve.

Similarly for Edna the tests served as an indication for learners on ‘whether they are ready to go forward’. In this regard the national tests served as a yardstick of the learners’ mathematical understanding and progress. Both Edna and Evelyn agreed that the ANA tests gave them the space to reflect on their learners’ maths performance and take the appropriate corrective measures. Thus for Edna the ANAs ‘. . .will give you time to do reflection, how can I do better, how can I go about to increase or improve the current results’. In the same vein for Evelyn these tests encouraged her to conduct a ‘reflection on how well our children had done or how badly’. For Swallow the ANA tests directly informed her maths teaching strategies especially on questioning techniques, thus to her the ANA allowed her:

to check if I am going about in the correct way, am I asking my questions in the correct way, or if they ask it in a different way is that not another way I should be looking at asking questions.

For Evelyn the ANA tests and the mathematical content that the learners are supposed to be taught are the same. Thus for her the ANA tests are good for the ‘children to be exposed to them because they actually learn that this is nothing different to what they have learnt it is just put in a different way’.

Lastly, and for Edna, the ANA tests were important because they were externally set national tests, ‘. . .it’s something coming from somebody else. . .it’s a national thing. . .it’s something that you didn’t set up for the kids’. Due to the acceptance of the value and validity of the ANAs the teachers in this category allowed their maths teaching practices to be influenced by the ANA tests. It is also interesting to note that the first three reasons given by the teachers for their alignment with the ANAs in their teaching are congruent with the national goals and purposes of ANA tests as set in the national policy (DOE, 2011).

#### Therapeutic (teacher-advocate) - Belinda

Of all the nine teachers Belinda seemed the only one to be unaffected by the ‘official pedagogic modalities’. She rarely aligned herself with the national curriculum policy views of the recently introduced (CAPS) or the previous one (NCS) or the ANAs and maintained firm rooting in the Montessori holistic child approach which she had experience of. During the interview Belinda defines Montessori as ‘a methodology of working with children...very practical and hands on’. Belinda repeatedly emphasises the practical aspect of the Montessori approach which she experienced during her teacher training:

*. . .there was quite a lot of practical training where you actually had to work with the children a lot more practical than I think in most of the training that gets presented we had a lot of practical stuff.*

Her Montessori training also focused on other key yet unique teaching foundations such as the need to do ‘a lot of (learner) observations’, ‘dual teaching’, and the ‘psychological perspectives on children’ and their learning. The Montessori approach is foreign to the local curriculum discourse contained in the NCS and the new CAPS curriculum statements. According to Morgan *et al.* (2002) teachers within the *Teacher-advocate* position speak the alternative discourse and explicitly reject the official criteria. According to Bernstein (2000, p.64) this is typical of de-centred identities which draw resources “from local contexts or local discourses”. Thus according to Belinda her maths teaching approach is not exam oriented neither did the ANA tests affect her teaching. She says ‘so it didn’t really (influence), my approach is not really from that side’ (test-focused). Belinda’s ‘holistic child

approach' arouses in her the interest to, 'look(s) at why something has happened...there are always a thousand reasons sometimes when you are working with children why things don't always work out the way they seem'. This statement illuminates distinct aspects of this teacher identity category in the sense that this position is dependent upon internal sense-making procedures, with the teacher having to think flexibly at the numerous reasons when things do not work out when teaching learners. It also illuminates the humanistic orientation towards students and the integrated approach to teaching and learning of teachers in this category.

With regard to the teaching and learning of primary mathematics Belinda had been heavily influenced by her Montessori pre-service teacher training, which had inculcated in her the core value and need '...to teach the mathematical concepts from a very concrete base'. During the interview Belinda mentioned 'wooden blocks', 'towers of blocks' and 'various pieces of equipment' as examples of concrete things that enable learners to 'work with the senses' and in the process 'get a tactile sensual impression' of numbers.

Belinda was driven by the need to develop number-sense amongst her learners using concrete objects for learners to understand mathematical concepts and numbers. Belinda's autonomous orientation to the Montessori, holistic child approach that emphasises practicality and the concretisation of mathematical concepts, her discourse and primary maths teaching practices are distinctively non-aligned to local teaching or national assessment practices.

#### Teacher-adviser (neo-conservative-therapeutic) - Pamela

Of all the participants in the sample, Pamela is the only teacher to position herself in relation to Morgan *et al*'s (2002) *Teacher-Adviser* position. The *Teacher-Adviser* position features are found in both Bernstein's Neo-Conservative and Therapeutic Pedagogic identity categories. This primary maths teacher position and identity is articulated by Pamela, who in the midst of the ANAs remained steadfast to the earlier curricula and was concerned with teaching her learners 'the five learning outcomes'. In explaining her teaching identity position which aligned with previous national curricula requirements, Pamela insisted that 'I should be teaching everything those LOs (Learning Outcomes) with their assessment standards so that I know my



learners at the end of the year'. Learning Outcomes and Assessment Standards were amongst the key curriculum features of Curriculum 2005 which was the first curriculum policy in the post-apartheid education. Besides an Outcomes Based Approach this curriculum policy was also underpinned by integration and socio-constructivism and explicitly emphasised a learner-centred approach (DOE, 2000). The *Teacher-Adviser* position is also "orientated towards the student" (Morgan *et al.*, 2002, p.456) and on this aspect relates with the therapeutic pedagogic identity which is "produced by complex theories of personal, cognitive and social development, often labelled progressive" (Bernstein, 2000, p.68). In primary maths education, Curriculum 2005 features closely relate with Bernstein's therapeutic pedagogic identity category (Pausigere and Graven in press). It is on these bases that we link Pamela with the therapeutic identity position.

Under Curriculum 2005 the primary maths Learning Outcomes, included the knowledge, skills, values and attitudes that learners displayed at the end of the educational experience and these were assessed through an on-going participative informal and formative assessment means (standards) (DOE, 2000). Under this curriculum the five main primary maths Learning Outcomes were Numbers, Number patterns, Shape, space, time and motion, Measurement and Data handling. These 'five learning outcomes' contained the key fundamental tenets that enabled learners to understand the rudiments of elementary mathematics. The five learning outcomes provided 'exemplars and criteria' of foundational and fundamental concepts in primary mathematics. Through teaching her learners the basic primary maths concepts which were embedded in the LOs, through integration and learner-centred approaches, Pamela speaks the "voice of the legitimate discourse" (Morgan *et al.*, 2002, p.456) as contained in the then local national curricula's – official pedagogic modalities – C2005 and the NCS. Furthermore according to Bernstein (2000, p.68) the Neo-conservative like the Conservative pedagogic identity emphasises the importance of specialised categories of discourses which under the former position are recontextualised to enable "engaging with contemporary change". Pamela's concern with teaching the 'five learning outcomes' is an attempt to engage learners in the basic primary maths concepts which have been recontextualised into Learning Outcomes under C2005. Such a view resonates with the Neo-Conservative pedagogic identity.

Besides being deeply immersed and concerned with the five learning

outcomes, the influence of the ANAs on her teaching is somehow minimal, or in her own words, 'not that much'. She argued that she hoped to see in the near future a change in the manner in which ANA test items are set up as 'sometimes you see that they didn't cover all the learning outcomes' and she wanted 'each and every ANA question' to 'have at least one of the learning outcomes in it'. Her take on ANA aligns with the *Teacher-Adviser* position which 'implicitly refers to the official criteria'. Thus Pamela did not completely reject the importance of the standardised tests for she held that these were important especially if the 'five learning outcomes will be covered in the (ANA) paper'. She also suggested that assessment standards enabled her to know her 'learners at the end of the year' implicitly suggesting the importance of assessment for benchmarking purposes. Pamela's latter position on the ANAs reflects on yet another feature of the Neo-conservative pedagogic identity as it puts emphasis 'upon performance'. Pamela thus fits into the *Teacher-Adviser* position which combines features of the Neo-Conservative and the Therapeutic pedagogic identities which were influenced by C2005's informing principles, whilst taking a relatively neutral position on the ANAs.

## Concluding remarks

In this paper we have illuminated the way in which a sample of nine primary maths teachers participating in an in-service community of practice took up four different positions and pedagogic identities in relation to the recent introduction of ANAs. We have drawn on both Bernstein (2000) and Morgan's (Morgan, 1998, Morgan *et al.*, 2002) study. In this analysis we have revealed overlaps between pedagogic identity categories and maths teacher positions. In the light of our theoretical framework and the empirical data we argue that the different pedagogic identities and positions taken by the teachers are influenced by the state's education reforms as well as the primary maths teachers' own beliefs and practices. Generally our findings indicate that most of the primary maths teacher practices are to a certain degree being influenced by the ANAs but however differently. In concluding this paper we caveat that this study only reports on the participants' responses from two interactive interview questions about their views on the ANAs. The study could have been strengthened by observing some of the teacher's maths lessons prior to the writing of ANAs. However in this limitation lies the

strength of this study as Morgan *et al.*, (2002, p.453) argue that in the “context of interviewing” it “is easier to trace” the teachers’ positions in relation to the official discourse. The sample is also small to allow for generalisations but even with a large participant sample one might come with some of the teacher position categories identified in this study. The analysis is confined to local primary maths teachers and thus is context and primary level specific. It would be interesting therefore to read results of similar studies that use the same theoretical framework in different countries or for maths secondary school teachers.

In contexts of national testing Hill, Blunk, Charalambos, Lewis, Phelps, Sleep and Ball (2008) suggests that primary teachers must guide learners to understand maths and raise standards. This position is captured in Bernstein’s ‘Neo-Conservative pedagogic identities’ and is articulated by Ruth who ensures in her primary maths teaching practices that learners, ‘do both’ – ‘understand the topic’ and ‘do well in the test’. We also share in the notion that teachers are professionals who should exercise their autonomy and be ‘critical’ in their approach to policy and external assessment in relation to their maths teaching practices – a stance taken by Robert when he refuses in his practices to be ‘blindly lead’. In national testing regime contexts primary maths teachers as autonomous professional need to ‘critically align’ (Jaworski, 2003) with education policy, and so ‘keep in mind’ their mathematical moral obligation whilst at the same time being concerned with their learners’ performances and the repercussions of their performance. The notion of ‘critical alignment’ is a key aspect of the projected professional numeracy teacher identity promoted within NICLE.

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