

Teachers in the National Curriculum Assessment Policy: What Powers Do They Hold?

Mutendwahothe Walter Lumadi

*University of South Africa, College of Education, Department of Curriculum and
Instructional Studies, South Africa
E-mail: Lumadmw@unisa.ac.za*

KEYWORDS Teachers. Curriculum. Assessment. Mathematics. Further Education and Training. School Management Team

ABSTRACT This article opens up a discussion on the power that teachers have in mathematics curriculum at the Further Education and Training Level. It is related to the general question: who beats the drums in school mathematics education in South Africa? To what extent is the teacher given an opportunity to exercise power in mathematics assessment? If the teacher is given power, what does that power allow him/her to do, and under what conditions does this happen? From the vantage point of assessment, this article is an attempt to unpack the question of teacher power by looking at how teachers are positioned in the National Curriculum Statement (NCS) Assessment Policy for Mathematics (Grades 10-12, Department of Education). The case of mathematics is presented here to illustrate the above complex questions of teacher power in curriculum assessment.

INTRODUCTION

The researchers focus on the assessment policy for two reasons. It is because it is widely recognised that assessment is the engine of education systems. Conceiving assessment as an engine is a powerful way of thinking about education. Stated more practically, when one looks at assessment, one looks at an engine: what drives education systems. Education systems run on the fuel of assessment. The engine-power of assessment can be seen for example, in South Africa, in how the outcomes of assessments are not only celebrated, but also how under-performing schools and their administrators are perceived by society. Focusing on assessment is also consistent with the highly valued philosophy that assessment is integral to teaching (Le Grange 2004).

Assessment in the National Curriculum Statement is an integral part of teaching and learning. For this reason, assessment should be part of every lesson and teachers should plan assessment activities to complement learning activities" (DoE 2005). In the introductory remarks to the Assessment policy for mathematics, the DoE (2005) states the following:

"Together, these documents assist teachers in their teaching of the National Curriculum Statement. The Department of Education encourages teachers to use this policy as it prepares to teach the National Curriculum Statement".

No one needs further convincing that the assessment policy are conceived as a critical

resource that should be able to assist teachers in their teaching of mathematics in accordance with the National Curriculum Statement. Viewing assessment policy as a resource, that is, tool for looking into learning systems and what becomes of learning draws us to a key conceptual backbone of educational thinking in our context of education in South Africa in as far as resources and tools are concerned. There are various readings one has drawn from in the thinking about assessment as resource tools. However, one has seen that most of these readings hinge upon a notion of transparency as conceived by Adler (1999). Adler (1999) draws on Lave and Wenger (1991) and points out that "access to a practice requires its resources to be 'transparent'", while maintaining that the idea of transparency "is not usually applied to language as a resource or developed in school settings". She however notes that this idea is "useful and illuminating when applied to the use of language in schools". She then introduces the notion of "visibility and invisibility" in relation to "transparency in the practice of teaching mathematics" and argues that. Resources need to be seen to be used. They also need to be invisible to illuminate aspects of practice.

RESEARCH METHODOLOGY

The study employed qualitative and quantitative methods. A structured questionnaire, designed on a four point Likert Scale (Strongly

Disagree=SD, Disagree=D, Agree=A and Strongly Agree=SA and a semi-structured interviews were employed to collect data for this study. A reliability test was computed, Cronbach alpha ($p > .7$), to test the reliability of the questionnaire, which revealed an average of .83. The study used purposive sampling in twenty schools, five from each of the four provinces of South Africa which were selected as sites for the study. The participants from secondary schools were randomly sampled. As part of the research ethics, permission to record the interviews was granted and teachers gave their consent to participate in the study. One hundred and sixty ($n=160$) teachers from four South African provinces completed the questionnaires. These teachers were also interviewed, through face-to-face and group interviews from each education district (see summary of biographical data in Table 1).

Table 1: Summary of biographical data

Information of participants	Summary of responses	
	F	%
<i>Gender (n=160)</i>		
Male	75	47
Female	85	53
<i>Age (n=160)</i>		
27 – 34 years	67	42
35 -39 years	34	21
40+ years	59	37
<i>Teaching Experience</i>		
1-5 years	21	13
6-10 years	69	44
11-15 years	35	21
16-20 years	16	10
21+ years	19	12
<i>Type of Schools (n= 20)</i>		
Rural	12	60
Urban	03	15
Farm	05	25
<i>Educational Provinces (n=4)</i>		
Gauteng	05	25
Limpopo	05	25
Kwa-Zulu Natal	05	25
Western Cape	05	25

RESULTS

It is from a perspective of transparency that one takes a walk through assessment policy which mathematics teachers and other “stakeholders” are called upon to use as resources in their work. One cautions here that such a walk is unlike one through Amber Hill. Although it might appear epistemologically closer to the cross-

roads, Boaler (2002) has hinted at in her Phoenix Park case study, traversing the twists and turns of assessment is not a walk-in-the-park either. One says this in order to attend to a consideration of the complex richness of an analysis of assessment policy and the legitimating power that it is intended to give to teachers in mathematics and other school learning areas. In this article therefore, one shows how one has worked with the emerging questions and ideas on assessment from a transparent and complexity perspective. The narrative one presents here is deliberately descriptive in order to demonstrate two key aspects that are constituents of the engine of assessment policy, namely “daily assessments” and “programme of assessment” and their intertwining concepts. One sums the article by exposing what one has seen as emerging and complex contradictions in assessment.

Daily Assessment

Van der Horst and Macdonald (1997: 170) suggest that assessment is a strategy for measuring knowledge, behaviour, performance, values and attitudes. There are two forms of assessment being proposed in the NCS: continuous assessment and external assessment. *Continuous assessment* is a form of assessment, which when used jointly with “informal daily assessment” and “formal programme of assessment” (1997: 1) is instrumental for the development of “learners’ knowledge, skills and values”, and the identification of “learners’ strengths and weaknesses” so that support for learners’ content needs is planned timely. As it stands, continuous assessment should have a significant role to play in shaping learners’ learning and “language proficiencies” in mathematics (Kilpatrick et al. 2001; MacGregor and Price 1999; Brink 2006; Burns and Grove 2005). However, given that this form of assessment only “counts 25%” of the final mark at Grade 12, does that not mean that there is less recognition at the policy level of the significance of continuous assessment? A key component of continuous assessment is “daily assessment”. According to the DoE (2005), this kind of assessment is essentially formative as it occurs “during learning activities” where the aim is for the teacher to *monitor* learner progress. Furthermore, it is stated that this monitoring by the teacher “can be done through question and answer sessions; short

assessment tasks completed during the lesson by individuals, pairs or groups or *homework exercises*”.

The marking of these assessments has a powerful pedagogical dimension. Individual learners, groups of learners or teachers *can* mark these assessment tasks. Self-assessment, peer assessment and group assessment actively involves learners in assessment. This is important as it allows learners to *learn* from and *reflect* on their own performance (emphasis added).

The DoE states that “the results of the informal daily assessment tasks are not formally recorded *unless the teacher wishes to do so*” (p. 2, emphasis added). Nevertheless, there is importance attached to these assessments because teachers *may* use the learners’ performance in these assessment tasks to provide verbal or written feedback to learners, the School Management Team and parents. This is particularly important if barriers to learning or poor levels of participation are encountered.

However, the fact that “the results of these assessment tasks are not taken into account for promotion and certification purposes” puts into question the significance of these assessments.

One might consider these assessment proposals as liberating and flexible given that:

- (i) a range of strategies, not just a single one, are suggested for monitoring learner progress; the teacher or learner *can* mark these assessments, so it does not matter who marks them;
- (ii) there is a taken-for-granted assumption that learners should learn from and reflect on their performance as they engage with assessment tasks; and
- (iii) “The results of the informal daily assessment tasks are not formally recorded *unless the teacher wishes to do so*”.

With respect to (i), one needs to ask the question: how do teachers *decide* what form of assessment task should be given to learners and *when* should this happen? If teachers decide to give learners “homework exercises”, how do they decide which form of tasks should be allocated for homework? Therefore, while one is told: “teachers’ lesson planning should consider which assessment task will be used to informally assess learner progress”, it is not clear how the teacher needs to select (Morais 2002) or plan for these tasks particularly given that there are several forms of regulatory tasks that are seem-

ingly transparently available and made known to teachers.

With respect to (ii), it is important to ask the question: how are teachers able to decide which tasks should be marked by learners, and which ones can only be marked by teachers? With respect to (iii), one needs to ask the question: what “opportunities to learn” (Werner et al. 2008) mathematics is presented in the tasks and learners’ performance in these? How these learning opportunities are evident in tasks, and can teachers anticipate these? In what ways can teachers be able to think about the nature of these opportunities and at what time they might arise? A similar question needing to be asked with respect to (iv) is the following: how do teachers decide which assessment results are useful to record and which ones are not? In all these questions lie a complex of tensions and dilemmas which one believe undermine the power of teacher decision making because of the contradictory nature in which opportunities to make decisions are framed.

Of pedagogical importance in the NCS policy is the importance of feedback. It is stated that “teachers *may* use the learners’ performance in these assessment tasks to provide verbal or written feedback to learners, the School Management Team and *parents*. This is particularly important if barriers to learning or poor levels of participation are encountered”. Aside from the question of what kind of feedback is more appropriate and for what purposes, there needs to be engagement with the issue of what kind of feedback needs to be given to parents. In relation to this, how do teachers decide to use verbal rather than written feedback? If written feedback is given to parents particularly the kind of feedback that is consistent with the taxonomy and rating scales proposed (see p. 6 in the NCS mathematics assessment policy), how do teachers ensure that parents are able to understand what the feedback means? One poses this question while acknowledging the fact that there does seem to have been a paradigm shift in assessment in South African education that is palpably resonant with the widespread wave of reform that is shaping current theoretical thinking in assessment (Krathwohl 2002; Wiliam et al. 2004; Davis and Simmt 2003).

It seems quite clear here that teachers have a considerable amount of flexibility in the nature and extent of the assessments that should con-

stitute “daily assessment”. However, it is surprising that these daily assessments are accorded very little importance if any at all. According to the DoE, “the results of these assessment tasks are *not taken into account for promotion and certification purposes*”. The question therefore is: why should teachers take daily assessments seriously when little value has been placed upon these? Related to this is a very important ideologically positioned contradiction that this seems to be an aspect where freedom and power for the teacher is called to be exercised while what that freedom does is essentially undervalued and a mockery (Sethole 2005).

Program of Assessment

On the other hand, there is assessment that appears to fall under what is called “Program of assessment” which seems to be more valued than daily assessment.

In addition to daily assessment, teachers should develop a year-long formal Programme of Assessment for each subject and grade. In Grades 10 and 11 the Programme of Assessment consists of tasks undertaken during the school year and an end-of-year examination. The marks allocated to assessment tasks completed during the school year will be 25%, and the end-of-year examination mark will be 75% of the total mark (DoE 2005).

What is entailed in “tasks undertaken during the school year”? How much control does the teacher have in the nature of what these tasks look like? How are these tasks different from “daily assessment” tasks? Whatever these tasks are, it is clear here that because they are developed by the teacher, the teacher has a fair amount of control over how these need to look like. In fact, because assessment of these tasks “counts 25% of the final grade or year mark”, it means that the teacher should take these more seriously than the daily assessments. However, it appears that the teacher has *little control* over the *number* of assessments of this form (Morais 2002). “If a teacher *wishes* to add to the number of assessment tasks, he or she *must* motivate the changes to the head of department and the principal of the school”. In addition, “The teacher must provide the Programme of Assessment to the subject head and School Management Team before the start of the school year”. The latter point means that once the teacher has de-

veloped the program of assessment for the year, the program is no longer in his/her control, given that she/he needs to provide a motivation for changing *her/his own* plan of assessments once submitted to the school management team and to “learners and parents”.

A question arising from the above concerns the fact that there seems to be an emphasis on the “number of assessment tasks” in the Program of assessment, rather than on the nature of those assessments. The question here therefore is: what is the main reason for asking teachers to submit a plan of assessment to the subject head and the School Management Team? It is obviously clear that the aim in the NCS policy is to ensure that there is a regulatory mechanism that should guide the instrumentation of assessment in schools. However, to what extent does this regulatory mechanism address issues of quality in the way it has been stated? And how would the School Management Team, learners and parents judge the quality of these assessments? Educators and administrators alike have a bitter regulative lesson to learn here if they do not see what power relations are at play in policy pronouncements of the assessory nature such as the one dealt with in the study. An interesting development in the NCS assessment policy is the fact that there is an attempt to move away from tests and examinations as providing the only means of providing feedback on learners’ progress. According to the DoE (2005),

the remainder of the assessment tasks should not be tests or examinations. They should be carefully designed tasks, which give learners opportunities to research and explore the subject in exciting and varied ways. Examples of assessment forms are debates, presentations, projects, simulations, literary essays, written reports, practical tasks, performances, exhibitions and research projects.

One sees from the above that opportunities are being created, as learners engage with assessments, to “research” and “explore” mathematics as a discipline, what it means, and perhaps how it applies to learners’ everyday lives. However, while opportunities are being opened up for assessment, it is not clear what these proposals mean for schools and learners who come from disadvantaged contexts. So the power question here concerns research for what purposes (Murray 2002 ; Robinson 2002) and who benefits from such research.

One clearly robust way in which mathematics can be explored in a way that makes it exciting is to involve learners in technological contexts. For example, one of the assessment standards in Learning Outcome 2 states that one knows that learners are able “to investigate, analyse, describe and represent a wide range of functions and solve related problems” when they are able to generate as many graphs as necessary, initially by means of point-by-point plotting, supported by *available technology*, to make and test conjectures about the effect of the parameters k , p , a and q for functions including: $y = \sin(kx)$...

In Learning Outcome 4 (data handling), Grade 11, one of the contexts requires learners to calculate “the variance and standard deviation of sets of data manually (for small sets of data) and using *available technology* (for larger sets of data), and representing results graphically using histograms and frequency polygons”. Learners are also required to “use available technology to calculate the regression function which *best fits* a given set of bivariate numerical data” (p. 24, emphasis added). Given the flexibility and efficiency of technologies such as handheld graphing calculators, the proposals being suggested in the National Curriculum Statement policy are commendable given that they have the opportunity to allow learners to work efficiently with mathematical ideas and computations involving these. However, while the teacher might plan his/her assessment in keeping with these technological opportunities, one needs to recognise whether in disadvantaged contexts such as rural township schools would be able to afford these. In such a case, the *choices* for the teachers are further limited in terms of their selection of assessment tasks and tools that could be used to enhance learners’ engagement in these. So while technological tools may add a conceptually and didactically powerful dimension to teaching, when the conditions in which teachers teach mathematics and other related disciplines are hostile, the power of teaching tools becomes fruitless.

Emerging Contradictions

The above analysis of the assessment policy has indicated that teachers are given some power and flexibility over what goes on in the daily assessments that learners engage with in

their mathematics activities. For example, the teacher is given power to choose from a range of strategies for monitoring learner progress. In addition, once the assessment tasks have been undertaken by learners, the teacher can decide whether to mark them or whether learners should mark their own written work. What is also particularly interesting is that the teacher can choose whether to record the results of the assessments or not. “The results of the informal daily assessment tasks are not formally recorded *unless the teacher wishes to do so*” (DoE 2005). The point one has made here is that while it does appear that the teacher is given such power over assessment at the informal daily level, this power is highly limited for two reasons. First, the results that emerge from the teacher’s exercise of such power over assessment are not given much political significance. It is stated that “The results of these assessment tasks are not taken into account for promotion and certification purposes” (DoE 2005). Secondly, it is not clear how the teacher is to exercise such power. In view of these reasons, one proposes here that while the intention of the NCS is to allow teachers freedom to work in ways they find themselves in their contexts, such freedom is a chimera – only an imagination. The question then becomes, why should the NCS provide these opportunities for teachers to exercise their freedom or power over assessment when in fact the same NCS knows that teachers will eventually have limited power? What is the aim of the NCS in having such proposals? In the concluding section below, one suggests that the NCS finds itself in this predicament because of an attempt to align itself, as can be expected, to the principles of Outcomes-Based Education, OBE, which are largely figments of imagination.

According to Spady (1998), there are three key assumptions to OBE. “All students can learn and succeed, but not on the same day in the same way; successful learning promotes even more successful learning; and *schools control the conditions that directly affect successful school learning*” (emphasis added). It is the third assumption that is more pertinent to “blind spots” (Le Grange 2004) and the closed assessment box one is opening here. It seems that the NCS is attempting to give teachers more power over daily assessment because teachers, as critical constitutive agents of schools, control the conditions that directly affect successful school

learning. One is talking here about the day-to-day work of teachers as learning managers in their own classrooms. It is the centrality of the teacher that the NCS seems to be rightly uplifting here. In terms of OBE, the centrality of the teacher is beginning to be best captured by Todd and Mason (2005) in their elaboration of how “proximal” and “distal” factors interact with each other in order to enhance learning. Todd and Mason (2005:225) distinguish between proximal and distal factors as follows:

For Wang et al. (1993: 276) the path to improved school learning is clear: “If practitioners and teacher educators wish to enhance school learning, they must attend to proximal variables such as:

- (a) psychological variables, especially meta-cognition and cognition;
- (b) classroom instruction and management, and student and teacher social and academic interactions; and
- (c) the home environment”.

Wang et al. (1993: 278) go so far as to assert that distal variables have “little influence” on school learning: “distal variables are at least one step removed from the daily learning experiences of most students. Simply instituting new policies ... will not necessarily enhance student learning... Effective policies require implementation by teachers at the classroom and student level... Proximal variables like psychological, instructional, and home environment variables have more impact on learning than most of the variables studied and should be part of an effective strategy to promote student learning.

According to Todd and Mason (2005: 229), “The most effective factors [for improved learning] depend on the teacher, and other distal variables have an impact to the extent that the teacher exploits their potential in enhancing learning. The teacher who is most effective at enhancing learning will provide much feedback that is appropriate to students’ current understanding and plenty of reinforcement to motivate students to achieve their goals”. Todd and Mason continue to suggest that “The challenge for South African teachers is to maximize these proximal factors that have been identified in the research, in spite of the difficulties they face because important distal variables remain unsatisfied”.

Is the way the NCS assessment policy is stated an attempt to satisfy the “proximal” factors associated with effective learning to which the

teacher is a central part? The analysis presented above points to the affirmative. The NCS recognises that the teacher is central to assessment decisions that need to be made in the classroom. However, in as far as the results of daily assessments are not accorded the same status as those from external and programmed assessments, one argues that the NCS’s attempt to satisfy proximal factors that are central to effective learning are a mockery.

DISCUSSION

Assessment policy will continue to exert more influence on what goes on in schools more than the cursory power given by teachers as they engage with learners’ in typical classrooms. One suggest here that a further elaboration of the rationale and conceptualisation of daily assessments is necessary in order for South African education policy to “maximize the ability of teachers to exploit ... proximal factors” which according to Hattie (1999) are concerned with teachers coming to “know what our students are thinking so that one can provide more feedback...and develop deep understanding”. The key issue centres on recognising the need to have “teachers who understand their discipline well, and who care about their students and what they know”. For it is such teachers who “will be better able to set challenging goals and to provide well-directed feedback” (Todd and Mason 2005). One posits that mathematics education in South Africa can only be able to obtain such kind of teachers if policies are developed and implemented in such a way that they recognise the power that teachers have over daily assessments in addition to, and more importantly, sensibly recognising the value of these assessments. One proposes that such a sensitive recognition needs to engage with the deeper layers of complexity that are inevitably implicated in mathematics teaching as well as in teaching other critical areas of the school curriculum particularly language and the natural, economic and life sciences. There is a need to turn to an examination of the learning and assessment outcomes of the later learning areas in further discussions similar to the one presented here.

CONCLUSION

In conclusion, it is imperative to point out that possessing mathematical power includes

being able, and predisposed, to apply mathematical understanding in new situations, as well as having the confidence to do so. A comprehensive program of mathematics assessment includes opportunities for students to show what they can do with mathematics that they may not have studied formally but that they are prepared to investigate. Some assessments may be designed to determine how well students, presented with an unfamiliar situation, can use what they have learned previously. Mathematics teachers attempt to formulate a statement about the school mathematics curriculum based on current understanding of mathematics and mathematics learning.

RECOMMENDATIONS

Practice in Mathematics

Students should have frequent opportunities to practice, formulate, grapple with, and solve complex problems that require a significant amount of effort. They should then be encouraged to reflect on their thinking.

Prior Knowledge

Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge. Learning mathematics with understanding is essential.

Reasoning and Listening Skills

When students are challenged to think and reason about mathematics and communicate the results of their thinking with others, they learn to be clear and convincing in their verbal and written explanations. Listening to others explain gives students opportunities to develop their own understanding

REFERENCES

- Adler J 1999. The dilemma of transparency: Seeing and seeing through talk in the mathematics classroom. *Journal for Research in Mathematics Education*, 30(1): 47-64.
- Boaler J 2002. The development of disciplinary relationships: Knowledge, practice, and identity in mathematics classrooms. *For The Learning of Mathematics*, 22(1): 42-47.
- Brink HL 2006. *Fundamentals of Research Methodology for Health Care Professionals*. Cape Town: Juta.
- Burns N, Grove SK 2005. *The Practice of Nursing Research.: Conduct, Critique and Utilisation*. St Louis: Elsevier Saunders.
- Davis B, Simmt E 2003. Understanding learning systems: Mathematics education and complexity science. *Journal for Research in Mathematics Education*, 34(2): 137-167.
- Department of Education 2005. *National Curriculum Statement Grades 10-12 (General) Subject Assessment Policy (Mathematics)*. Department of Education: Pretoria.
- Kilpatrick J, Swafford J, Findell B (Eds.) 2001. *Adding It Up: Helping Children Learn Mathematics*. Washington DC: National Research Council.
- Krathwohl D 2002. A revision of Bloom's taxonomy: An overview. *Theory into Practice*, 41(4): 212-218.
- Lave J, Wenger E 1991. *Situated Learning: Legitimate Peripheral Participation*. Cambridge, England: Cambridge University Press.
- Le Grange L 2004. Ignorance, trust and educational research. *Journal of Education*, 33: 69-84.
- MacGregor M, Price E 1999. An exploration of aspects of language proficiency and algebra learning. *Journal for Research in Mathematics Education*, 30(4): 449-467.
- Morais A 2002. Basil Bernstein at the micro level of the classroom. *British Journal of Sociology of Education*, 23(4): 559-569.
- Murray S 2002. Get real? Some thoughts on research for teaching and research for policy. *Journal of Education*, 27: 59-78.
- Robinson A 2002. Research in action and research for action: Working in a participatory action research framework with a government department. *Journal of Education*, 28: 105-121.
- Sethole G 2005. From the Everyday, Through the Inauthentic, to Mathematics: Reflection on the Process of Teaching from Contexts. In: HL Chick, JL Vincent (Eds.): *Proceedings of the 29th Conference of the International Group for the Psychology of Mathematics Education*, Vol. 4, pp. 169-175. Melbourne: PME.
- Spady W 1998. Outcomes-Based Education: An international perspective. In: J Gultig, C Lubisi, V Wedekind, B Parker (Eds.): *Understanding Outcomes-Based Education: Teaching and Assessment in South Africa*. South African Institute for Distance Education and Oxford University Press: Cape Town.
- Todd A, Mason M 2005. Enhancing learning in South African schools: Strategies beyond Outcomes-Based Education. *International Journal of Educational Development*, 25: 221-235.
- Van der Horst H, Macdonald R 1997. *Outcomes-Based Education*. Pretoria: Kagiso Publications.
- Wang M, Haertel G, Walberg H 1993. Towards a knowledge base for school learning. *Review of Educational Research*, 63(3): 249-294.
- Wenger K, Maher C, Powel A, Lee H 2008. Learning opportunities from group discussions: Warrants become the objects of debate. *Educational Studies in Mathematics*, 68: 247-261.
- William D, Lee C, Harrison C, Black P 2004. Teachers developing assessment for learning: Impact on student achievement. *Assessment in Education*, 11(1): 49-65.