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Insights into Grade 2 teachers' enactment of formative assessment in mathematics in selected priority schools in Gauteng

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This article reports on Grade 2 teachers' perceptions of formative assessment in explaining the phenomenon of the underutilisation of formative assessment practices in mathematics teaching. A qualitative and interpretative case study investigated two Grade 2 teachers' enactment of formative assessment in priority schools in Gauteng. Data were collected through semi-structured interviews and observations of lessons. The basic principles of qualitative content analysis were applied during data analysis and guided by the formative assessment theoretical framework proposed by Black and Wiliam (2009). The study revealed that teachers' enactment of formative assessment was limited by their vague understanding of formative assessment and the tensions between formative assessment and curriculum compliance. The study's central claim is that teachers may know about formative assessment, but if they do not understand how children learn and engage in mathematics learning, then they are unlikely to enact it correctly. While teachers who attended the in-service training programme were able to use some of the strategies as singular tools, they were still unable to implement the combined strategies that constitute the formative assessment pedagogy. Hence, the formative assessment practices of teachers bore limited possible returns on investment to improve learning outcomes in mathematics. The unique contribution of this study is its potential to inform teacher development, policy and practice as it yielded important insights while reinforcing and amplifying existing knowledge.

Keywords: assessment for learning; compliance; curriculum coverage; developmental; enactment; formative; learning outcomes; mathematics; summative

Introduction

With the recent advent of curriculum policy reforms in South Africa, the need for changes in classroom assessment to improve learners' learning in mathematics has become an important area for development (Kanjee & Sayed, 2013). The stronger focus on the use of assessments to improve learning requires teachers to find assessment methods other than tests and examinations to assist in identifying learners' needs during their learning processes and providing timeous feedback.

The primary purpose of assessment is to enhance learning during the learning process, rather than using it to rank, judge, evaluate or grade learners (Popham, 2008). The South African National Assessment policy (Department of Basic Education [DBE], Republic of South Africa, 2011) articulates assessment as the process of gathering, recording, interpreting, using and reporting information about a child's progress and achievement in developing knowledge, skills and attitudes. Assessment, therefore, goes far beyond testing; it involves daily interactions between the teacher and each learner, such as moment-by-moment interactions, observations and engagements. The South African policy is hence consistent with global trends that advance the pedagogical use of assessment – in particular formative assessment – as opposed to a sole focus on the summative use of tests and examinations (Earl, 2003). Even though the policy clearly promotes the pedagogical use of assessment to improve learning, recent studies in South Africa (Berry, 2011; Kanjee, 2009; Kanjee & Sayed, 2013) have reported on the dominant use of summative assessments in South African classrooms.

This study relates to Black and Wiliam's concern (1998:53) about the "poverty of practice" of formative assessment among many teachers worldwide, causing learning outcomes to be unachieved. International literature describes formative assessment as an effective tool in fulfilling learners' learning and teachers' instructional needs. While the current South African curriculum policy affords opportunities for formative assessment, the actual implementation of formative assessment practices remains a concern (Kanjee & Sayed, 2013). This affordance is made possible by the key progression principle underpinning the curriculum, which provides opportunities for teachers to scaffold learning by focusing on the developmental needs of learners. Despite these affordances embedded in the curriculum, I have observed in my capacity as a subject advisor in the Ekurhuleni District administered by the Gauteng Department of Education, and lately as a lecturer in the Department of Early Childhood Education, that the integration of formative assessment practices among Foundation Phase teachers in mathematics is not optimally executed.

My interest in the underutilisation of formative assessment stems from the growing concerns about the poor mathematics performance of learners as revealed by national and international studies. Investigations by the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SAQMEQ), Trends in International Mathematics and Science Study (TIMSS) and the Annual National Assessments (ANA) all indicate that a significant number of learners in South Africa do not reach the expected levels of competency in mathematics. The studies by TIMSS and SAQMEQ (Moloi & Chetty, 2010) list teachers' lack of skills and knowledge in assessment strategies as a reason for learners' poor performance. This study was further prompted

by the limited research on the phenomenon of formative assessment. Most studies in the field of mathematics – including those by SAQMEQ (Moloi & Chetty, 2010), TIMSS (Fleisch & Schöer, 2014) and the ANA (DBE, 2012) – report on learner performance, with insufficient attention given to formative assessment as a developmental aspect of mathematics learning.

This study sought to establish why formative assessment is not widely used in South African schools (despite the empirical evidence that it is a powerful pedagogic tool) by gaining insights into Grade 2 mathematics teachers' understanding and enactment of formative assessment. The main research question that guided this study is "How do Grade 2 teachers in priority schools understand the role, purpose and practice of formative assessment in mathematics?"

The study findings may assist the DBE, curriculum developers, policymakers and other stakeholders involved in curriculum planning and development of mathematics in the early grades to revise their policies and improve the curriculum, so that teachers can effectively integrate formative assessment in their pedagogical practices.

Literature Review

Conceptions of formative assessment

The reviewed literature, which explains teachers' inconsistent practices of formative assessment, highlights a variety of conceptions thereof (Bennett, 2011; Klenowski, 2009; Schneider & Randel, 2010). I argue that the lack of a universally accepted definition of formative assessment may contribute to a misplaced understanding of the intended principles and purpose of formative assessment. In this article, I selected the following definition of formative assessment:

> All those activities undertaken by teachers, and by their students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. Such assessment becomes 'formative assessment' when the evidence is actually used to adapt the teaching work to meet the needs of learners. (Black & Wiliam, 1998:7)

I regard this definition as the most appropriate for this study as it emphasises the function of assessment in the support of learning. Black and Wiliam (1998) further contend that assessment is formative only when the evidence of learning prompts teachers to modify their instruction and activities to improve the learning processes and learning outcomes. It is critically important for teachers to understand how learners think if they want to provide learners with appropriate support. Through formative assessment, teachers can gather information about learners' performance, thinking, knowledge and potential, all of which are building blocks for further educational instruction either through new content coverage or the revision of material already covered in the classroom (Ginsburg, 2009).

Research on the enactment of formative assessment

The enactment of formative assessment is beset with problems and appears to be superficial in many classrooms (Brookhart, Moss & Long, 2010; Marshall & Drummond, 2006; Torrance, 2001). A common occurrence, as reported by Marshall and Drummond (2006), is the technical application of Assessment for Learning (AfL) techniques and procedures as reflecting the letter of AfL rather than its spirit, which would make learning explicit and promote learning autonomy. Similarly, Wiliam (2011) observed that teachers used AfL strategies to collect evidence of learners' learning prowess, yet they seldom adjusted their teaching. Black and Wiliam (2009) found that formative assessment is not optimally utilised in classrooms, which means that superficial and rote learning still dominate classroom evaluation practices. The assessment techniques emphasise memory recall of incoherent details and knowledge items that learners easily forget.

Although the South African curriculum and assessment policies legitimise both summative and formative assessments (DBE, Republic of South Africa, 2011), continuous assessment is seldom practised in classrooms (Kanjee, 2009; Kanjee & Sayed, 2013; Vandeyar & Killen, 2003). This is attributed to various reasons. The first reason is the tension between formative assessment and high stakes summative assessment to hold schools accountable for learner achievement (Kanjee & Sayed, 2013). The pressures to perform well in the provincial common assessments – and the now-suspended ANA – resulted in teachers "teaching to the test" to meet performance goals at the expense of learning for conceptual understanding. The second reason is teachers' weak understanding of formative assessment. This finding is supported in Kanjee and Sayed's study (2013:464) which found that Foundation Phase teachers demonstrate "below basic level understanding" of formative assessment as a result of ineffective teacher training and professional development on formative assessments. Vandeyar and Killen (2003) note that the underutilisation of continuous assessment can be attributed to teacher training institutes underpreparing teachers for continuous assessment practices. In terms of assessment, teacher training largely focuses on administrative issues such as the completion of government-mandated forms. The third reason is that the curriculum policies and the regulatory frameworks to improve learning outcomes tend to promote the summative use of assessments by privileging formal testing over informal assessments (Heritage, 2010; Kanjee & Sayed, 2013). The national curriculum policy does

not provide adequate details on the tools and techniques to be applied in enacting formative assessment (Kanjee & Sayed, 2013), yet the policy provides structured guidelines on summative assessment by stipulating the number of formal tasks per term in each subject, as well as the recording procedures and reporting protocols (DBE, Republic of South Africa, 2011).

Curriculum provisions to improve learning outcomes in mathematics

In Gauteng, schools comprising a higher percentage than 60% of learners achieving results lower than 50% were categorised as "priority schools" for the purpose of intervention. Priority schools constituted 65% of primary schools in Gauteng. The Gauteng Department of Education (GDE) introduced the curriculum coverage model (CCM) along with annual teaching plans to assist teachers with curriculum completion. The CCM requires teachers to report to the district on curriculum coverage twice during the term. Among the CCM model's guidelines is that learners are expected to complete written activities daily, which would present teachers with opportunities to analyse learners' errors. Taylor and Moyana (2005) note that the purpose of the CCM has veered from tracking progress on learning outcomes to monitoring evidence of voluminous written work. They add that written assessments should always be supported by observation and informal interviews in the pursuit of a realistic understanding of learners' thinking.

The Gauteng Primary Literacy and Mathematics Strategy (GPLMS) provided another intervention with its scripted lesson plans for teachers. These GPLMS lesson plans were intended to strengthen the implementation of the curriculum policy. A study by Fleisch and Schöer (2014), however, found that teachers encountered difficulties with the translation of lessons and the materials into a new practice. Many teachers adhered rigidly to the lesson plans without adapting the learning content and material to their classroom contexts and their learners' needs, which resulted in several outcomes being unattained. Another problem encountered in the teaching of mathematics was the over-reliance on procedures at the expense of conceptual understanding. Carnoy and Arends (2012) report that 77% of the observed lessons required learners to recall facts, rules and definitions or to perform calculations without any connection to related concepts. Reeves and Muller (2005) conclude that higher learning gains are achieved when learners are presented with tasks that demand higher levels of cognitive engagement, such as tasks that engage learners on the foundational principles of mathematical procedures rather than merely instruct them on how the procedures work. To this end, the teaching and learning mathematics framework (DBE, Republic of South Africa, 2018) was recently conceptualised to promote the understanding of mathematical principles. This framework constitutes four key dimensions: conceptual understanding, mathematics procedures, strategic competence and reasoning (as underpinned in a learning-centred classroom).

The recent increase in interest in formative assessment prompted the GDE to introduce the AfL professional development programme (PDP) in schools. The term AfL is used synonymously with formative assessment (Harlen, 2006). I conducted my investigation in the Tshwane South District where the teachers have attended the AfL PDP, which allowed me to identify "living examples" of formative assessment who were hence eligible as study participants (Black & Wiliam, 1998:15). Wylie, Lyon and Goe (2009) conclude that the embracing and implementing of formative assessment requires teachers to significantly adapt their methods. Scholars such as Heritage, Kim, Vendlinski and Herman (2009) further argue that teachers require extensive and ongoing professional development, since teachers cannot be expected to incorporate these formative assessment practices through a few targeted workshops only.

Theoretical Framework

Black and Wiliam's formative assessment theory (2009) was selected as the framework for this study. This theory intimates that formative assessment is an integrated process of teaching and learning and elucidates the interactive roles of the teacher, the peer and the learner during the teaching and learning process. The five key strategies of the theory are to clarify learning intentions as well as the criteria for success; to engineer effective classroom discussions that elicit evidence of learners' learning; to provide feedback that moves learners forward; to activate learners as learning resources for one another; and to activate learners as owners of their own learning. These strategies denote the social nature and dimensions of the learning and assessment processes. As this theory is situated within a socio-constructivist perspective, the functions of context, social interaction, knowledge sharing and knowledge construction are vitally important for formative assessment practices. The element of context is reified by Edwards (2007) when he argues that assessment should be interpreted within the context of the learner's background and experiences. Therefore, for feedback to have a positive effect on learning, any feedback must be tailored to individual needs and experiences in terms of language diversity and respective differences in learners' abilities and learning styles (Edwards, 2007). Teacher–learner interaction, as well as learner–learner interaction, are crucial components of knowledge construction

and the mediation of learning. To ensure quality interaction, it is incumbent on the teacher to understand and regard the child as a collaborator and co-constructor of knowledge (Edwards, 2007).

According to the socio-constructivist perspective, the roles of the teacher and a more knowledgeable peer are crucial in providing support and scaffolding the learning so that the learner can progress in their learning efforts. Vygotsky's theory of learning (1980), in which he introduced the concept of the zone of proximal development (ZPD), is an appropriate construct for understanding the developmental aspect of learning. Within the ZPD, teacher–learner interaction is a critical element of an effective teaching and learning strategy. Regular interactions allow the teacher to discover what a child's learning needs are, how that child's learning may be assisted and what the child can achieve with appropriate support.

Methodology

The nature of the research questions – addressing teachers' classroom practices and embracing the context of assessments and learning – lent itself to an interpretive paradigm. I followed a qualitative research approach using a case study design (Corbin & Strauss, 2008). According to Yin (2015), a case study design is suitable for studies that seek to answer how and why questions. By employing a qualitative case study design, I gained insight not only into how and what, but also into why teachers do what they believe are formative assessment practices.

The study reported in this article is a pilot of a larger study investigating Foundation Phase teachers' enactment of formative assessment in mathematics teaching. This study was conducted with two Grade 2 teachers from two urban public schools that have shown the most improvement in learner performance within a selected district in Gauteng province. The schools were selected to represent a large group of similar schools that were categorised as "priority schools" based on the learners' overall ANA results. Among the interventions that had been offered to those priority schools was the AfL workshop, which was presented only to Grade 2 teachers in the selected district. The motive for selecting schools where results have improved was driven by the opportunity to ascertain whether formative assessment had indeed positively contributed to the learners' academic development.

The two participating teachers are referred to as Linda and Sarah (pseudonyms) in this article. Both teachers have a Foundation Phase academic qualification and had taught mathematics in Grade 2 for longer than three years. They had worked for the major part of their careers in a system that used prescribed lessons as they followed the GPLMS, which is an intervention programme for priority schools designed to improve learning outcomes in literacy and numeracy.

Classroom observations constituted an appropriate way to investigate the teachers' classroom practices and collect relevant data. The mathematics lessons were video recorded and transcribed to facilitate analysis. Field notes were used as a supplementary activity to support the recordings by adding important contextual details (such as the nature of classroom tasks, grouping, practical demonstrations and others). The data collection process further involved semi-structured interviews with the teachers as well as follow-up discussions with them after the classroom observations and document analysis were done. The semi-structured interviews were structured around specific formative classroom assessment incidents that were observed in their classrooms. Data were analysed using the constant comparative method with pattern matching. This method involved the coding of data from the interview transcripts, pattern matching from the completed observation schedules and the field notes. The coded data were aggregated in categories. Related categories were then grouped (Creswell, 2009) and synthesised into themes pertaining to the research question.

Findings and Discussion

To illuminate the Grade 2 teachers' formative assessment practices, the findings are presented and discussed under two themes. The first theme is the teachers' vague understanding of formative assessment and their superficial enactment of formative assessment strategies, and the second theme is tensions between formative assessment and curriculum compliance.

Teachers' Vague Understanding of Formative Assessment and Their Superficial Enactment of Formative Assessment Strategies

The effective enactment of formative assessment in a classroom is a fairly elusive task mainly because of the pseudo- and dual meanings and interpretations attached to formative assessment as a concept. The interviews provided valuable insight into the teacher participants' perceptions of the term "formative assessment", its purpose and how it should be applied in practice. Linda and Sarah expressed the following views: "*I know that formative assessment is about observing learners as you teach, to find out who is struggling. It is about gathering information about whether they* [learners] *have learnt something or not*", and "*Formative assessment is a way of checking with learners to see if they've understood what you've tried to teach them, and in a way that there's still time to work on those concepts. Sometimes we think we have taught them something, but perhaps they*

haven't got it just as well as we wanted them to. Hmmm, I think it's mainly useful to identify the learning difficulties of struggling learners."

These responses suggest that teachers' understanding of the purpose of formative assessment is fragmented. Both focused on the gathering of evidence (identifying learners' difficulties), but neither of them mentioned the interpreting of that evidence to modify or enhance further instruction. Black and Wiliam (1998:140) posit that "assessment becomes formative only when the evidence is used to adapt the teaching to meet learners' needs." Yet neither of the teachers described formative assessment as a process that involves different components. Formative assessment in practice includes multiple activities, ranging from eliciting evidence about learner achievement, interpreting the evidence and using the evidence to make instructional decisions to improve teaching (Black & Wiliam, 2009).

The classroom observations and the vignettes presented here indicate that both teachers enacted segments of the formative assessment strategies in a disconnected fashion, omitting to coherently link the strategies to improve learning. This finding resonates with previous studies (Black & Wiliam, 1998; Brookhart et al., 2010; Klenowski, 2009) that illustrate how the varied definitions and the lack of clarity in perceptions result in confusion about the practical implementation of formative assessment.

Making the learning intentions explicit

Both participants indicated during the interviews that their teaching had changed after attending the AfL workshops. Sarah: "*I teach differently now. It's about using the strategies*", and Linda: "*I write on the board every day what they are going to learn.*" The following vignette describes how Linda enacted the strategy of making the learning intentions explicit to her learners. She had pasted two labels on the chalkboard: "WALT – We are learning to …" and "WALF – We are looking for … ." She then told the class: "*WALT means 'we are learning to', and WALF means 'we are looking for.' We are learning to put three-digit numbers in the correct place. We are also going to know the importance of the three-digit numbers in each place.*" Soon after, she said: "*Our success criteria are what we are looking for. You will put the numbers in the right places. You will break numbers into hundreds, tens and units.*"

A similar observation was made at the other school when Sarah wrote the following on her chalkboard: "Our learning intention is to order, describe and compare the numbers from biggest to smallest and smallest to biggest." She then told her learners: "*Our success criteria are what we are looking for*", whereupon she wrote: "Put the numbers in order from biggest to smallest and use the signs."

In both classrooms, the majority of time was spent on repeating the learning intentions and success criteria until the learners had memorised them. Sarah stated: "*The strategies are good, but now we must teach our children the learning intentions. Where is the time to do this?*" This comment indicates the teachers' misunderstanding of the proper application of the techniques, since they view them all as something to be taught to learners. This finding resonates with Heritage's (2010) study, indicating that the embracing and integrating of formative assessment practices into their pedagogy involves significant changes for teachers to absorb and requires their continual professional development. Professional development needs to go deep in terms of subject content, and teachers need opportunities to test, reflect on and revise their practices (Darling-Hammond, 2009). Furthermore, the teachers used the terminologies and language that they encountered during their own training to teach the learners. Apart from the complexity of language on academic levels, English was a second language for most learners in each class. Similar problems are listed in Marshall and Drummond's (2006) study which investigated the technical application of formative assessment methods.

Eliciting evidence of learners' understanding

Both teachers alluded to the importance of asking questions to stimulate learners' thinking. However, this practice was not correctly applied in the lessons as both teachers asked questions that required procedural, factual and yes/no responses that had little value in terms of formative assessment. This situation is illustrated by the following two vignettes. Linda asks a learner: "*Do you remember what we learned yesterday?*" (Learner does not respond.) Linda continues: "*It was about greater and less than. Eh, do you remember? Can you remember this sign?*" (Linda shows the less than and greater than sign.) In the other school, Sarah tells her class: "*Let us all say together, 'You start on four, then you go like this mmm (m represents a jump) to go to eight. You say mmm, and then go to 12.*'" Sarah then asks the class to skip count in fours using their counting chart. She notices that some learners are struggling, so she asks the following questions:

> *Where do you start? How many numbers did you skip? How many jumps did you take? Do you remember, when you count in twos you missed one number, when you count in threes you miss two numbers, now when you count in fours, how many numbers do you miss?*

Carnoy and Arends (2012) report similar findings in their study of early grade mathematics. They state that learners are regularly required to recall facts, rules and definitions or to perform calculations without any connections to related concepts. This finding supports Reeves and

Muller's (2005) claims that higher learning gains are achieved when learners are presented with tasks that demand higher levels of cognitive engagement, such as tasks that engage learners on the principles underlying mathematical procedures instead of instructions that merely illustrate how those procedures work. Generally, the majority of time is spent on the repetitive "drilling-in of information" that reduces opportunities for higher-order learning, cognitive stimulation and instructional conversation such as the formulation of explanations, approaches to problem-solving and the application of concepts.

Mismatch between teachers' feedback and the learning outcomes

While the participating teachers were aware of the importance of feedback in teaching, many ineffective feedback practices were observed. An example occurred during a lesson on expanded notation as observed in Sarah's classroom. Her learners had to add the two-digit numbers 35 and 28. Sarah noticed a learner writing (30 + 5) + (20 + 8); (30 + 20) + (5 + 8); 50 + 13; 50 + 4 = 54. The learner had a problem with regrouping in the fourth step. Instead of regrouping 13 into 10 and 3, the learner added 1 and 3 in 13 to get 4. Instead of identifying and addressing this error using the strategy of expanded notation, Sarah opted to show the learner how to use the vertical method and carry-over to get the correct answer. It became evident that her feedback lacked specificity and failed to match the learning outcome, which was to use the technique of breaking down and building up numbers during calculations. The mismatching of feedback with the stated learning outcome is attributed to teachers' limited mathematics content knowledge, which precludes teachers from providing scaffolded support appropriate to the learning goal (Heritage, 2010).

The teachers' reliance on procedural ways of teaching to provide feedback inhibited their formative assessment practices, as illustrated by the following vignette. Linda tries to explain to a learner who struggles to calculate 122 – 14: "*Write number 122 under hundred tens and units columns. Then 14 is a two-digit number. Write it under tens and units columns. There is no number under the 1 in 122 when the sum is written vertically. You can put a zero there, but you are not allowed to put a zero after a number. If you put a zero after the 4 in 14, it will be 140. The zero before the number tells you there is nothing. If the block is empty you must fill that space with a zero.*" Linda is confident in her mathematics knowledge that the addition of a zero after a number changes the value of the number, but she fails to provide a logical explanation of why it is true. Later, she asks her class: "*2 minus 4. Can you minus? No. It is because the 4 is bigger. Can I swop the two numbers around?*" (The learners do not respond.) She explains: "*Because this unit* [2 in 122] *is not big enough, you need to borrow 1. But where do I borrow from?*" A learner replies: "*From 2* [the 2 in 122]." Linda continues: "*Now the 2 becomes 12 and the two tens become 1. What are 12 minus 4, 1 minus 1, and 1 minus 0?*" She then instructs her learners to solve a similar example on their own, yet most learners still struggle to calculate correctly.

It became evident during this vignette that Linda's learners did not grasp the fundamental aspects of calculation. Her explanations were not logically detailed. She mediated the procedures without establishing and promoting numeral relationships and connections to the conceptual knowledge that she was supposed to present to them. Consequently, her strategy for teaching the concept confused the learners, as they viewed the mathematical rules and the positioning of digits as separate, independent events. In addressing this critical problem of procedural teaching methods, the mathematics teaching and learning framework for understanding (DBE, Republic of South Africa, 2018) supports the teaching of calculations that involve the carry-over technique by introducing teachers to the use of the 10 frames and base 10 blocks. This approach provides teachers with opportunities to identify learners' errors during the learning process through scaffolded support and feedback.

Additionally, this study identified the teachers' limited assessment knowledge which inhibited their formative assessment skills. In one lesson, Linda used an interactive video as a resource to teach the concept of fractions. The video showed two friends using a recipe that included fractional quantities (e.g. half a cup of sugar) to bake a cake. After the cake was baked, the friends planned to share it equally between them. As they were about to cut the cake into two halves, another friend arrived. So, the three friends decided to share the cake equally among the three of them. However, just as they were about to cut the cake into thirds, a fourth friend arrived. Just as they were about to share the cake between four people, a fifth friend arrived. And so it went on. Subsequently, a learner called Kiara – normally a shy and withdrawn child – screamed, banged her pencil case on the desk, shook her head and covered her eyes. Kiara's physical response made it evident that she understood the concept that more people sharing a whole means that the shared pieces become smaller. However, during the post-observation discussion, Linda interpreted Kiara's response as simply being disruptive. It was clear that Linda lacked the professional skill of observation needed to gather evidence of the individual's learning techniques, which meant that she could not capitalise on a valuable opportunity

to assess and develop Kiara's learning (Black & Wiliam, 1998).

This study hence revealed that the participating teachers lacked a clear understanding of the purpose of formative assessment techniques. The teachers mentioned that those strategies were new to them and that they struggled to integrate them into their existing lesson plans. Sarah stated: "*We were never shown how to integrate it in our lesson plans. But we were told to do this now*." This remark signals a perceived lack of support from the authorities and the school management team. This finding was confirmed by the subject advisors who had received AfL training and who explained that their monitoring had become a "tick box exercise" as even though they are not mathematics specialists, they were expected to support the mathematics teachers with the implementation of AfL guidelines. In terms of the wider implementation of AfL, there appeared to be little synergy between schools and administrations on district and provincial levels, resulting in a variety of implementations among respective schools and teachers. The senior management teams in both schools appeared to be apathetic towards the AfL programme. Their sporadic support for the implementation of the AfL is attributed partly to their lack of understanding of the intentions of AfL and partly to their misunderstanding of the programme's implementation.

Tensions Between Formative Assessment and Curriculum Compliance

Curriculum provisions such as the CCM, prescribed lessons and the Annual Teaching Plan (ATP) precluded teachers from implementing formative assessment practices, as confirmed by Linda and Sarah respectively: "*Our teaching has become ATP-paced, not learner-paced. If we are behind, we must account for this. Then you are in the spotlight for not complying*", and "*It seems like we are teaching and assessing for the officials. We know about the policies. That we need to accommodate every learner. But we don't consider the policies anymore.*" Teachers experience the ATPs as aggressive schedules that create pressure to keep them racing along a track and never allowing them to track back and reteach material whenever the need arises. Furthermore, teachers view the ATPs as too prescriptive as they do not consider individual differences in a learner group. Linda and Sarah noted respectively: "*That is where the problem lies, to deliver the same curriculum to all learners, yet they have such diverse abilities*", and "*The stronger learners are always the ones that you can feed the curriculum as it is and they will learn, but the weaker learners are the ones you have to break it down and you need to find ways to teach them.*" Sarah acknowledged the need to use varied strategies to accommodate learners with diverse abilities, but she added that it is a difficult task given the prescribed curriculum that teachers have to adhere to. Learning paces differ within any group; some learners require multiple opportunities before they can grasp a concept, which cannot be accommodated in the ATP schedules. The gathered data indicated that the teachers felt pressured to rigidly implement the scripted lessons and ATPs without having the time to reflect on what curriculum coverage means beyond the confines of classrooms.

The interviewed teachers perceived curriculum coverage as obliging them to teach everything contained in the plans, rather than teaching the material to aid learners' understanding. Teachers adhered rigidly to the ATPs irrespective of classroom contexts. A subject advisor corroborated this finding when he observed: "*Teachers use the ATP as a lesson plan, instead of a tracking document*." Strict adherence to the ATP has prevented teachers from providing timely support to learners who have not yet grasped the taught concepts, leaving them behind. Sarah noted that, "*if you know there is trouble with addition, now in the first term, you just leave it and move on. There is no time to support the slow learners. So, in the second term, when you are doing addition again, you go back to the first term's work and explain that work again. You then follow on with the Term two content.*" Teachers' misplaced understanding of the ATPs was also evident in the way that they completed the CCM reporting tool, which showed that teachers reported on all that they had taught, irrespective of whether learners had understood the content. They perceived this strategy as "curriculum coverage." To adhere to the ATPs, teachers tend to prioritise content coverage, which results in surface learning with inadequate time for formative assessment, thereby missing opportunities to identify and address individual and collective learning needs.

The analysed data indicated that teachers have become increasingly disempowered as they grow ever more dependent on the guidelines, policies and frameworks that regulate the curriculum provisions. Many teachers have resorted to "teaching to the test" and seem to ask questions that focus on correct answers. This study established that teachers' rigid adherence to lesson plans constrained their formative assessment practices, as those plans disregard the diverse abilities of learners (DBE, Republic of South Africa, 2011). I hence support Hodgen and Wiliam's proposal (2006) that, even if teachers are required to follow prescribed lessons, they should be able to develop new activities by adapting older (proven) ideas, instead of employing activities that do not meet children's learning needs. Thoughtfully designed tasks can yield rich data on

learners' thinking, help teachers to identify the problems that learners encounter and help them to plan accordingly (Hodgen & Wiliam, 2006).

Both teachers expressed frustration at being involved in too many intervention programmes simultaneously, which caused confusion and increased their workload. This sentiment was evident in the following responses by Linda and Sarah respectively: "*Why don't the department just stop giving us so many projects? Leave us to teach at least two years before adding on and changing*", and "*Because we are classified as 'priority schools', we have become the target for the department. We are involved in almost all the interventions.*" Linda added: "*We have to teach the GPLMS lessons and then report on curriculum coverage and on top of it all we have to do AfL, follow the ATPs and the other programmes. How can we do justice to teaching if we have to worry about AfL, ATPs, CCM?*" A district subject advisor supported these sentiments when he stated:

> *There are so many workshops and programmes which all are done in silos. AfL is hardly ever factored into that. Ideally, what should happen is that somewhere, someone should say let us see how these strategies can fit into the existing projects we have.*

Furthermore, the different intervention programmes lacked coherence, which made them more difficult for teachers to implement. Linda and Sarah both alluded to the need for assessment-related workshops to help teachers teach and assess learners with diverse abilities. Linda: "*We were never trained to assess learners with diverse abilities in mathematics. Many of our Grade 2 learners are working on a Grade 1 level. So, assessing them on a Grade 2 level, you're not going to achieve anything. However, you have to work with them and you have to assess them.*" Sarah explained that the assessment workshops offered by the district focused largely on the administration of assessment, and said: "*All that is discussed at the assessment workshops are due dates for submission of term plans, analysis of term results, reporting on curriculum coverage and common exams. Then they give us a template to complete the intervention plans to support learners. Why don't they show us how to plan the intervention, rather than how to complete the form?*" Similarly, Kanjee and Sayed's study (2013) found that during the forming of policies and guidelines, the discourse of reporting and recording is greater than the discourse of using assessments to improve teaching and learning.

If the AfL programme had been integrated into the existing GPLMS programme, then its implementation in schools would have been easier. Schneider and Randel (2010) support this finding, arguing that for changes in practice to happen, they must be integrated into the teachers' existing routines. Hence, had teachers been given leeway to plan according to the needs of their learners, then the implementation of AfL would have been successful. Coherent professional development also dovetails with events at the district level in terms of initiative, goals and policies. Garet, Porter, Desimone, Birman and Yoon (2001) report that coherence has a positive, indirect effect on teacher practices by improving teachers' knowledge and skills sets, as well as a direct effect on changes in teachers' practices.

Recommendations

Based on the study findings, the following recommendations are designed to improve the implementation of formative assessment in mathematics. Firstly, a skills audit of all teachers in the Foundation Phase needs to be conducted by the DBE for the purpose of in-service teacher training. The developmental needs of teachers can be identified during the teacher appraisal process by both the teacher and the school management team. The district can further contribute by providing a checklist to guide heads of department on criteria for assessing teachers' effectiveness in formative assessment based on the following facets:

- understanding and implementation of the Curriculum and Assessment Policy Statement (CAPS)
- content knowledge
- pedagogical knowledge
- assessment practices
- classroom management (time, learner diversity, and others).

Secondly, appropriate skills development programmes based on the analysis of the skills audit should be planned. Professional development programmes that emphasise subject content and how learners learn that content have a stronger influence on teacher training than development programmes on the general principles of educational instruction (Garet et al., 2001). Professional development must be linked to and aligned with the professional growth plans inherent to the teacher appraisal system. Professional development tends to be most effective when administrators understand the need for the development programme and actively participate in it (Brookhart et al., 2010).

Thirdly, forums at school and district levels, where communities of practice (CoPs) can be shared and benchmarked, should be initiated. According to Wenger (1998), collaboration through CoPs is effective because it unites people who have shared interests in learning or accomplishing something, and who contribute some knowledge or expertise.

Fourthly, teacher education institutions of higher learning should collaborate to review and revise curricula offerings integrated with assessment. The DBE should liaise and network with the Education, Training and Development Practices Sector Education and Training Authority

(ETDP SETA) for in-service training and the development of Foundation Phase teachers where the focus is on innovative and alternative assessment practices.

Conclusion

In this article, I argue that we, as educators, need to focus on optimising the multiple intended purposes of formative assessment, namely, teaching, learning, development and accountability. These intended goals have been neglected because teachers are so busy enacting curriculum targets that they forget about their motivations and ambitions in the teaching profession. This study confirmed that the agenda of compliance and enactment is being prioritised above the aspects of teaching, learning and development. Formative assessment, which can be effective in addressing that imbalance, is about identifying the gaps in children's learning and, when applied correctly, may serve as a steppingstone for teachers in support of their learners. Teachers, however, experience the dual responsibility of assessments and teaching (in their present forms) as burdensome. The analysed data indicated clearly that teachers know about formative assessment, yet they find it difficult to implement in their teaching strategies. Although the two participating teachers have attended professional learning programmes, they still struggle to enact the formative practices in their classrooms.

This study reveals that if we are serious about the effective implementation of formative assessment in schools, we must consider the following issues: Rather than judge teachers, we need to understand what informs their actions as teachers in developing the learners' foundational stages of learning. The study has implications for teachers, policymakers, teacher educators and future researchers into formative assessment practices.

Notes

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