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Actual and Ideal Assessment Practices in South African Natural Sciences Classrooms

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ABSTRACT Assessment practices form an integral part of science teaching and learning. The purpose of this study was to investigate actual assessment practices and compare them to ideal assessment practices according to the National Curriculum Statement (NCS) policy documents. A purposive sample comprising five Grade 9 educators was selected: three from high performing schools and two from low performing schools. Data were collected through lesson observations, reviewing portfolios of the educators and learners, and also through semi-structured interviews. The results show that educators' understanding of the various ideal roles of assessment ranged from 0% to 60% with the majority of items scored at 40%. This suggests a huge difference between actual and ideal assessment practices. These differences were identified from the purpose of assessment, integrating assessment and learning processes, outputs of assessment, the role of assessment, educators' and learners' portfolios, performance-based assessment tasks, the use of rubrics, and from the assessment of learning outcomes. The findings of this study may have far reaching implications in light of compliance to the Curriculum Assessment Policy Statements (CAPS) introduced in the country.

INTRODUCTION

Changes in assessment practices across the globe are intended to discover authentic ways of assessing learning in order to improve teaching and learning (Yung 2001; Louw 2003; Le Grange and Beets 2005). This has become necessary because written tests seem inappropriate for assessing higher cognitive processes (Gopal and Stears 2007). For instance, in Australia, the assessment practices of educators were aligned with learning by integrating Learning Outcomes (LOs), learning and teaching activities, and assessment tasks (Biggs 2003). In Hong Kong, educators were challenged to adjust their assessment practices to suit their new roles as assessors (Yung 2001). Similarly, in New Zealand, formative assessment (FA) was changed in order to include continuous assessment (CASS) with multiple purposes for the assessment of conceptual development (Bell and Cowie 2000).

Assessment practices of South African educators fall within the context of the National Curriculum Statement (NCS) which focused on LOs and on Assessment Standards (ASs) (Alexander and November 2010). In South Africa, the NCS policy documents were intended to measure learners' performances in line with LOs and ASs (Killen 2003). LOs are predetermined statements of what learners should demonstrate as a result of their learning (Alexander and November 2010). LOs in science are summarized as skills related, knowledge related and their knowledge applications in society (Sanders and Nduna 2007). All these were aimed at fostering problem solving, critical thinking, cultural sensitivity and the application of science in a responsible manner (Gopal and Stears 2007; Malcolm et al. 2004). On the other hand, ASs are precise quantifiable statements, which indicate expected levels of knowledge and skills that learners should demonstrate (Killen 2000; McLaughlin and Warren 2002). Therefore, assessment is meant to inform educators regarding the extent to which each learner meets the demands of the ASs (Jacob et al. 2000, Molloy 2008). Also, the purpose of assessment is to inform educators for about learners' progress and thereafter educators provide to feedback (Aldridge et al. 2009). Progress of learners according to Van der Horst and McDonald (1997) could be identified using written tests and examinations to improve learning. These test-based instruments should be used with other authentic and performance-based assessment instruments such as projects, research activities as well as

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scientific investigations (Department of Education 2000, 2002). Performance-based instruments include assignments, oral presentations, interviewing, conferencing, observation research activities and portfolios (Lianghuo 2002). Educators have different understanding of the purpose of assessment and this could hamper or enhance teaching and learning. In order to identify educators understanding of the purpose of assessment in science classroom, the Limpopo Department of Education in 2006 and 2007 organised workshops to empower Natural Sciences educators in assessment practices. The extent to which these assessment workshops were translated into actual assessment practices at school level remains largely unknown (Wolf and Fraser 2008).

Purpose of Study

The purpose of this study was to investigate actual assessment practices and compare them to the ideal assessment practices for Natural Sciences as stated in the National Curriculum Statements (NCS) of South Africa. Also, the study sought to determine the level of compliance with the ideal assessment practices in the NCS policy as emphasized in the Limpopo Department of Education educators' workshop.

The following research questions guided this study:

- What are the actual assessment practices used by Natural Sciences educators in the classrooms?
- How do actual assessment practices in Natural Science classrooms compare with the ideal assessment practices stipulated in the NCS policy documents?

Conceptual and Theoretical Framework

This research was conducted within the concept of Formative Assessment (FA), which according to the NCS policy documents (Department of Education 2000) considers aspects about clarity of focus and learning outcomes, high expectations and the idea that every learner can succeed (Ellis 2005). FA presents a challenge to educators because of the different beliefs regarding assessment (Vandeyar and Killen 2003; Engelbrecht and Harding 2004). FA is ongoing and provides feedback to both students and educators with regards to the learning process (Louw 2003; Klenowski and Wyatt-Smith 2010a,b) as well as opportunities for reflection in order to improve teaching and learning (Black 1998). Brookhart (2004) contends that formative assessment and feedback greatly impact on learning outcomes in an educational setting. In addition, summative assessment (SA) takes place at the end of teaching and learning (Gioka 2009; Black et al. 2004) and the results do not provide feedback to learners, but rather form a basis for promotion to the next level of learning.

Ideal and actual assessment need to be synchronized in order to effect meaningful learning. Ideal assessment refers to teachers' expected practices for both formative and summative assessments (Black et al. 2003; Looney 2007; Donnelly 2007; Lombard and Grosser 2008). Ideal assessment practices are multi-dimensional where formative assessments (FAs) are integrated into the curriculum using authentic context and flexible tasks (Birenbaum et al. 2006). Educators are also expected to ensure learners' progress in terms of specified grading parameters (Department of Education 2000, Lester 2005, Louw 2003). On the other hand, actual assessment refers to what takes place in a classroom situation where learners demonstrate their competencies (Woolston 2008). In order to assess any differences between the actual and ideal FA practices, the discrepancy theory or evaluation model was used (Provus 1971). This theory is based on observing activities and allows the observer to trace a dichotomy between compliance and non-compliance. In this study, actual assessment practices were compared to the set of expected practices as issued in the DoE guidelines.

METHODOLOGY

Research Design

This study utilised a phenomenological research design in which the actual assessment practices were studied. It is phenomenological because the study investigated assessment phenomena taking place in Natural Science classrooms and compared practices with the ideal assessment guidelines from the NCS policy documents.

Sample

A purposive sample (Denzin and Lincoln 2000) of five grade nine educators from five out

of ten secondary schools in the Maune circuit in Limpopo Province was selected. The researchers selected 5 teachers because they wanted to have a representation of both high and low performing schools that offered Natural Sciences. Therefore, three educators were selected from high performing schools and two from low performing schools. All the educators taught Grade 9 Natural Sciences at the time of conducting this research and had attended workshops on assessment.

Data Collection

Data were collected using lesson observations, analysis of educators' and learners' portfolios, and semi-structured interviews. These various methods were employed in order to triangulate the data collected (Straker 2009) and to increase trustworthiness (Flick 1998). Educators performed a 'member check' on their recorded interview data to ensure that the captured information correctly reflected their views (Shenton 2004).

Portfolios

These records included both educators' and learners' portfolios. The assessment of portfolios was done using a checklist (Neuman 2000). In addition, the researchers followed the specifications for ideal assessment practices of portfolios as stipulated in the Natural Sciences Assessment Guidelines (Department of Education 2005). Questions emanating from the analysis of records were corroborated with those from semi-structured interviews (Babbie 2001).

Observation

Non-participant observation was used in this study to collect data of the actual assessment practices involved. The researchers observed five lessons of each participant in order to document the actual assessment practices in the classrooms. During observations the focus was on what kinds of actual assessment practices educators were using in teaching and learning. Also, the observation included educators' and learners' portfolios to determine whether or not educators had planned subsequent teaching and learning tasks based on the outcomes of previous assessment tasks.

Interviews

Semi-structured interviews were conducted subsequent to lesson observations and analyses of educators' and learners' portfolios. Semi-structured interviews were chosen because they offered the interviewers a chance to ask questions to clarify data obtained from other sources (Babbie 2001). To establish the relevance of the interview questions and observations checklist, two experts checked the instruments and recommendations were effected before conducting the interviews and observations. All interviews were audio-taped and each interview lasted 40 minutes on average and this time was deemed sufficient to reduce initial anxiety (Shahid et al. 2009).

Data Analysis

Data collected from lesson observations and portfolios were analysed based on a checklist in order to determine compliance or non-compliance according to the discrepancy theory. Discrepancy theory was chosen because it allows the observer to map events into a dichotomy of present or absent, done or not done. This dichotomy is line with the purpose of this study. Data collected from semi-structured interviews were analysed thematically in order to provide a narrative account (Leedy 1997; Alvarez and Urla 2002). Average percentage compliance for 5 educators was calculated as follows:

$$1.\ \text{Average compliance for 5 eduators} = \frac{\text{Number of educators complying}}{\text{Participation}} \times 100$$

Percentage compliance per school is calculated as follows:

$$2.\ \text{Average \% compliance/school} = \frac{\text{Observed compliance frequency per educator}}{\text{Expected frequency/ educator/assessment item}} \times 100\%$$

Average percentage compliance for 5 schools was calculated as follows:

$$2.\ \text{Average \% compliance for 5 school} = \frac{\text{Total observed compliance frequency}}{\text{Expected frequency/ assessment item for 5 educators}} \times 100\%$$

RESULTS

The results indicate that actual assessment practices in the classroom differ significantly from ideal assessment practices as prescribed

by the National Curriculum Statement (NCS) policy documents. These differences are evident in the purpose of assessment, the integration of assessment and learning processes, and the outputs of assessment. The results show that educators' understanding of the various ideal roles of assessment ranged from 0% to 60% with the majority of items scored at 40%. For instance, none of the 5 sampled educators agreed that assessment was an integral part of the teaching and learning process while 3 out of the 5 educators agreed that the role of assessment was to identify learners' areas of excellence (Table 1).

Educators' portfolios contained records of different items, mainly tests and examinations. All five educators were expected to comply with the requirements of the NCS assessment policy by recording different items in the portifolios. Therefore, percentages of compliance were computed for educators who complied on each item divided by the total number of educators in the sample. Results from the portfolios show that assessment had minimum impact on the planning of future teaching and learning activities because compliance on formative assessment items ranged from 0% to 40% when compared to summative items that were scored at 100% (Table 2).

Learners' portfolios in participating schools consisted of books or files only. The frequency of occurrences of various components and percentage compliance per school from the learners' portfolios are presented in Table 3. Percentages of compliance per school ranged from 0% to 250% while average compliance for 5 schools ranged from 0% to 220% (Table 3).

Results of the LOs and ASs as well as reflections on and linking of the LOs and assessment standards indicate that none of the educators complied with ideal continuous assessment (CASS) guidelines and only 20% compliance was reached in the use of open-ended tasks (Table

Table 1: Results from interview of teachers' understanding of Ideal Role of assessment practices according to NCS policy

Ideal Role of assessment practices	*Expected frequency*	*Number educators complying*	*Average compliance for 5 teachers %*
Assessment – integral part of teaching and learning process	5	0	0.0
Assessment tasks – guiding future teaching	5	2	40
Assessment results - impacting on future lesson plan and presentation	5	2	40
Assessment results – leading to modification of teaching approach	5	2	40
Assessment – progressive and developmental.	5	2	40
Assessment – identification of the learner's area of excellence	5	3	60
Assessment – identification of the learners need for support.	5	2	40
Planning of steps to be taken to give the learner the support he/she needs.	5	1	20

Table 2: Items in educators' portfolios, number of participants and compliance percentages

Item	*Participants*	*No. of educators complying*	*Average compliance for 5 teachers (%)*
School based assessment tasks			
• Tests , examinations and memoranda	5	5	100
• Research projects	5	0	0.0
• Investigative tasks	5	0	0.0
• Translation	5	0	0.0
• Assignments	5	2	40
• Presentations	5	0	
Rubric	5	0	0.0
Sheet to assess achievement per learning outcome	5	0	0.0
Summary sheet of learners' performance in each grade	5	5	100
Evidence of school based moderation	5	2	40
Mark sheets	5	5	100
Analysis of marks per level for natural sciences	5	4	80

Table 3: Assessment compliance from learner portfolios in 5 schools

Expected purposes and components of compiling learners' portfolios in ideal assessment	*Expected*	*Frequency of occurrences (% compliance per school in parentheses)*										*Average compliance for 5 schools %*
		S1		*S2*		*S3*		*S4*		*S5*		
Tracking learners' progress	1	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Creating opportunities for growth and development in LOs and ASs	1	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Development of learners into thinkers	1	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Intervention strategies	1	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Assignments	5	0	(0)	1	(20)	0	(0)	0	(0)	1	(20)	8.0
Research projects	1	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Investigative tasks	3	0	(0)	1	(33.3)	0	(0)	0	(0)	1	(20)	13.3
Tests	2	5	(250)	3	(150)	5	(250)	5	(250)	4	(200)	220
Examinations	2	2	(100)	2	(100)	2	(100)	2	(100)	2	(100)	100
Presentations/performances	1	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Translations	3	0	(0)	1	(33.3)	0	(0)	0	(0)	1	(33.3)	13.3
Rubrics	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0

(S1-S5 represents schools, LOs represents learning outcomes, ASs represents assessment standards and expected numbers are from NCS policy document)

Table 4: Compliance in learning outcomes, assessment standards, criteria, checklists and reflections observed for 5 lessons

Aspects of assessment	*Expected*	*Compliance frequency (% compliance per school in parentheses)*										*Average compliance for 5 schools %*
		S1		*S2*		*S3*		*S4*		*S5*		
Learning Outcomes (LOs) indicated,	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Assessment Standards (ASs) indicated	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Summary of LOs and ASs in tasks	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Checklist for open-ended tasks	5	0	(0)	1	(20)	0	(0)	1	(20)	0	(0)	8.0
Reflection on achievements LOs	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Alignment of assessment to LOs and ASs	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0
Skills: (observing, comparing, recording sorting, classifying, interpreting, predicting, formulating hypotheses, questioning, planning investigations, conducting investigations, communicating, creativity, critical thinking and problem solving and applying science to new situations).	5	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0.0

(S1-S5 represents number of schools, LOs represents Learning outcomes, ASs represents assessment standards and expected numbers are from NCS policy document)

4). Also, the results indicate that there was 0% compliance in terms of the assessment of the 12 selected skills namely: observing and comparing, recording data, sorting, classifying data, interpreting data, predicting, formulating hypotheses, raising questions about situations, planning scientific investigations, conducting scientific investigations, communicating scientific information, and applying science to new situations to be assessed in ideal assessment practices, adopted from the Natural Sciences Assessment Guidelines (Department of Education 2005).

Interviews

Interviews revealed that the purpose of learners' portfolios was to show that learners had completed the assessment tasks and that the tasks were marked according to the DoE memorandum. Four themes were identified from the interviews with the educators: inadequate skills, time constraints, too many changes in the curriculum statements and assessment practices in South Africa, and rushed workshops for the teachers. Specific comments by individual edu-

cators are now presented as exemplars of the identified four themes:

Theme 1: Educators face capacity challenges when trying to implement ideal assessment practices.

When Educators were asked to state some of the challenges that hindered them from ideal assessment practices in accordance to OBE educator 1 stated:

Educator 1: I lack skills in designing tasks. I did not learn that in college. How can you expect me to do it?'

Educator 2: "I know how to set a test and compile a memorandum. How do you expect me to design performance based tasks and their respective rubrics without allowing me to acquire the skills of assessment? I just don't know what to do to help myself out. I think authentic, prolonged and expert facilitated professional programs are necessary to empower educators in order to deal with these huge changes such as assessment for a specific purpose and role."

Educators expressed frustrations when asked to teach using performance based assessment tasks such as practical investigative tasks, projects and research studies. Educator 5 stated:

Educator 5: "We were taught and assessed through traditional testing and we are therefore comfortable and confident to teach and assess learners using the same approach. Changing to new approaches and strategies of assessing learners is not a problem. Retraining and educators' professional development programs are prerequisite to such envisaged changes that OBE brings forth."

Educator 3: "Firstly, (long pause), diagnostic, formative and summative assessment are new terms which were recently introduced with the implementation of OBE. Secondly, I am struggling to understand exactly what each of these assessment forms mean. With time and professional support that I may receive from the curriculum support staff, I think I will stand a good chance in future to use these three forms of assessment to meet the expected purposes. For now, I assess according to my level of understanding"

Theme 2: On time constraints, two educators had this to say:

Educator 1: "Most of us do not live where we teach! We travel long distances to go to work and by the time we reach … aah!, we are really tired. As if this is not enough, we have to travel home in the afternoon and by the time we reach home, we are too exhausted to read".

Educator 2: "I am ready to try new things. The problem is that I don't have any new thing to try out at present. I wish I could be taken back to college to study new approaches and strategies that should be used especially in integrating assessment into the teaching and learning process. Besides the personal weaknesses that I have there are situational factors such as overloaded, classes, lack of science equipment and also scarcity of time that hinder me from trying out new strategies and approaches as expected".

Theme 3: On CASS assessment educators stated the following:

Educator 1: Many of us are confused by curriculum change and we do not know if the role of assessment is clearly spelt out in the policy. Some say continuous assessment is better than summative assessment. How do we know? It all remains to everyone's guess.

In response to using many tests, educators were very confident and satisfied with administering tests as is exhibited by Educator 3.

Educator 3: "Tests are easy to set or to access from textbooks and study guides. Besides, I have been trained at college to assess learners through testing and I have been doing it for exactly 18 years now. I don't know anything about these other new forms of assessment"

Furthermore, when Educator 3 was asked if he viewed it as the right thing to give more tests than the required number with no performance-based tasks and yet allocate marks from tests as marks for performance-based tasks, he responsed:

Educator 3: "No. It is inappropriate but at this moment I do not have any way out because I do not have any knowledge of any of these new forms of assessing learners, except giving tests".

An opinion was sought as to what were the educators' explanations regarding formative assessment which was not used as often as summative assessment. Educator 2 stated:

Educator 2: " Those terms are a matter of semantics. What I know there must be a test after a period of study to see if learners remem-

ber what was taught to them. The tests guide the Educator to decide who will go to the next grade and who will repeat the grade in the following year".

Theme 4: Commenting on in-service workshops attended, one educator stated:

"Workshops are offered once or twice in the afternoon and those sessions are not enough. The work is rushed and we remain more confused than when we started. Many of us who attended the workshops mastered very little."

On the issues of trying out new methods of teaching to address the identified knowledge gap Educator 5 responded as follows:

Educator 5: "I am ready to try new things. The problem is that at the moment I don't have any new thing to try out. I wish I could be taken back to college to study new approaches and strategies that should be used especially in integrating assessment into teaching and learning process."

There were varied reasons given why Educators did not assess learners according to OBE expectations. Below are such responses:

Educator 5: "For me participation in authentic professional development programs that are sustained for longer periods and are more specific is the best thing that can develop my competence and capacity to assess learners as per OBE expectations. Such programs should include prolonged in-service training workshops facilitated by experts, upgrading of qualifications with universities and colleges in science subjects that I teach."

Finally, all educators stated that they experienced an inability to align assessment with learning outcomes as well as assessment standards.

DISCUSSION

The purpose of this study was to investigate the actual assessment practices in science classrooms and to compare them with the ideal assessment practices as set out in NCS policy documents. The low compliance rate 0-40% suggests that there is a notable discrepancy between actual and ideal assessment practices. Major discrepancies were found in the role of assessment, educators' portfolios, learners' portfolios, performance-based assessment tasks and skills, the use of rubrics, and the Assessment of Learning Outcomes. Although it is documented that learners' progress depends on self-assessment by understanding their strengths and weaknesses and how they deal with them (Harlen and James 1997; Gielen et al. 2011), there was no evidence of recorded FA and self-assessment by the learners in the five schools studied (Table 1). This omission of FA and self-assessment is in sharp contrast with other studies that have been conducted elsewhere showing that self-assessment is a viable option for providing quality teaching and learning (Donnelly 2007; Harlen 2009; Klenwoski and Wyatt-Smith 2008; 2010a, b). It could also mean that the educators who participated in this study had no idea of the needs of learners and as such were unable to improve their own teaching (Aldridge et al. 2009). This perception may have caused educators to practice assessment as a post-teaching activity rather than an ongoing teaching and learning process and thereby compromised the importance of ideal assessment practices (Engelbrecht and Harding 2004; Lombard and Grosser 2008; Louw 2003; Ellis 2005). This scenario is similar to the incompetence in assessment that was reported from Australia, which was attributed to educators' perceptions of FA as a summative assessment practice and task (Weeden et al. 2002; Lester 2005). This perception may have caused educators to practice assessment as a post-teaching activity rather than an ongoing teaching and learning process and thereby compromised the importance of ideal assessment practices (Engelbrecht and Harding 2004; Lombard and Grosser 2008, Louw 2003; Ellis 2005).

Educators' portfolios in actual assessment practice were found to be in disagreement with ideal assessment practices in both content and purpose. Educators' portfolios show that none of the educators could identify LOs and link them with assessment tasks. This contradicts the principle of clarity of focus according to NCS, hence the purpose of assessment was missed (Birenbaum et al. 2006). Similarly, there was no indication of targeted ASs or their integration (National Protocol on Assessment for Schools 2005). Since the relationship between the educators' purpose of assessment and ideal assessment practices was not clear, educators could not apply the assessment principle of 'design down,' a practice that places LOs first in the process of planning a lesson (McGuire et al. 2003).

The educators' portfolios revealed that all five educators (Table 1) were less skilled in applying FA and designing learner-centered assessment activities which are an integral part of teaching and learning process. This concurred with Gustafsson's (2005) findings from a study conducted with Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ), which highlighted divergent teachers' assessment skills and subject knowledge in South African schools. In addition, this may explain the poor performance of learners in 1999 and 2003 in the Trends in Mathematics and Science Study (TIMMS) where South African learners achieved averages of 24% in 1999 and 23% in 2003 in the physical sciences (Rosenberg 2008). Similarly, learners' portfolios were not used to track progress, suggesting that LOs and ASs did not lead to self-directed learning (Sekhar et al. 2008). As a result, learners did not develop analytic insight into their own progress (O'Sullivan et al. 2002). Learners' portfolios did not display any of the skills and knowledge that learners were capable of demonstrating (Tubaishat et al. 2009). Moreover, the purposes of learners' portfolios were to maintain test records for curriculum monitors from the Department of Education so as to prove that assessment took place in schools (Table 3). The least expected yet most striking practice found in this study was that all the educators in the study designed more tests than were required with score on tests ranging from 150% to 250% and an average number of tests per educator of 220% (Table 3). This is probably because educators administer tests to keep learners occupied during their absence, regardless of the fact that such assessments are inadequate for learners' needs (Pennington et al. 2001). In addition, results from portfolios, observations, and interviews with educators revealed that other forms of tasks in FA were recorded as summative tests. This practice contradicts Tavner's (2005) call for educators to use appropriate outputs as evidence of authentic assessment. Educators displayed 0% compliance in assessing skills, performance-based tasks and in alignment of LOs and Ass, according to NCS, despite their crucial value as espoused by Fullan (2005) (Tables 4). This means that of the four domains; knowledge, skills, attitudes and values (Van der Horst and McDonald (1997), educators assessed knowledge and neglected the other three domains. Furthermore, none of the educators targeted the assessment of skills such as observing and comparing, recording data, sorting, classifying data, interpreting data, predicting, formulating hypotheses, raising questions about situations, planning scientific investigations, conducting scientific investigations, communicating scientific information, and applying science to new situations. This suggests that there was no compliance with NCS policy documents (Molloy 2008). The researchers' findings concur with Mogashoa (2013) regarding primary school educators assessment practices from North Gauteng, South Africa. This may not have been intentional, but educators lacked the competencies to assess skills such as creativity, critical thinking and problem solving as it was reported by Wolf and Fraser (2008). Also, it may partly be due to pre-service training which did not equip them with the necessary assessment skills (Potterton 2007). This is in agreement with the findings of Carless (2011) who contends that a change from summative to formative assessment is always a challenge for many educators. During observations, educators explained to learners the steps of doing experiments but no experiments were carried out by learners. This practice deprived learners of opportunities to learn science in a practical manner (Shepherd 2000; Tavner 2005; Fullan 2005; Molloy 2008). While ideal assessment practices emphasise constant use of rubrics in order to minimise the negative impacts of prejudices, the results show that none of the educators used rubrics. This finding is in contrast to positive results demonstrated by Ramnarain (2012) who used a rubric adapted from Villanueva and Webb (2008) to assess investigation of problems, formulating hypotheses, identifying variables and designing experiments.

The educators in this study neglected other multi-dimensional forms of assessment in which rubrics could have been used as references for educator's judgments regarding their learners' performances (Mertler 2001). Similar omissions in FA practices have been reported from elsewhere and it is a challenge to many educators (Chen and Brown 2013; Tepsuriwong and Bunsom 2013). Again, FA understanding of educators is often determined by socio-cultural factors (Chen et al. 2013). However, the extent to which summative assessment dominates (Carless 2011) may require further study. Also, it may

be of interest to determine how much compliance exists with regards to the Curriculum Assessment Policy Statements (CAPS), which was introduced by DoE to replace NCS in South Africa.

CONCLUSION

While this study examined the actual assessment taking place in science classrooms of 5 educators in one of the circuits in Limpopo Province, it is clear that there were differences in what was expected according to the NCS policy documents and the educators' practices. There were different opinions on various aspects of assessment like the purposes of assessment, integrating assessment and learning processes, outputs of assessment, the role of assessment, educators' and learners' portfolios, performance-based assessment tasks, the use of rubrics, and from the assessment of learning outcomes. Thus, many educators had academic challenges in complying with the NCS policy requirements. The study sample was small, 5 educators only, suggesting that the findings of this study may not be generalised to other areas in the province. However, the findings have a far reaching implication in the way educators comply with assessment standards set in the policy documents. Thus, findings of this study may be an eye opener for educators to do introspection and try to narrow the gap between actual assessment taking place in class and what is expected, the ideal assessment.

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