ABSTRACT - This study explores the influence of assessment on teachers’ teaching style and learner performance in Life Sciences in two schools of different contexts in one district of the North West province. This paper borrows its constructs from theorists such as Lev Vygotsky’s social constructivism as well as Lave and Wenger’s community of practice. This study followed an exploratory case study approach. Data was collected qualitatively through the interviews and document analysis. The two teachers were purposively selected based on a number of factors, such as location of the school, learner performance in previous years and resource availability, particularly infrastructure. Data gathered were thematically analysed using inductive analysis. Document analysis was used to analyse data from lesson plans and learners exercise books. The findings of the study indicate that assessment enables teachers to identify their shortfalls and mend the gap, thus, allowing them to improve their teaching styles. As learners are continuously assessed by using different forms of assessment, their confidence gets fully build and their performance improve. The paper concludes with recommendations on how effective assessment behaviours can be incorporated by teachers during the teaching and learning process to improve learner attainment.

Keywords: Assessment, learner performance, Life sciences, teacher teaching styles, different context

1. Introduction

Assessment is an integral part of teaching and learning (Vandeyar & Killen, 2007). It plays a major role in how learners learn, how teachers teach and their motivation to teach and to learn. The primary purpose of assessment is to improve teachers’ teaching styles and learners’ learning patterns as the two are informed by the outcomes of learning in the whole process. Assessment is interconnected with curriculum and instruction. This study explores the influence of assessment on teachers’ teaching style and learner performance in Life Sciences in two schools of different contexts in one district of the North West province. The two teachers were followed in their school contexts to examine how assessment influences their teaching styles and its role on their learners’ performance.

1.1 Background

Assessment at school level refers to the wide variety of methods or tools that teachers use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of learners (DBE, 2011). As an integral part of teaching and learning, assessment’s main purpose is to inform the teacher of learners’ level of understanding of the concepts. Though there is still existence of contextual differences among the schools which create a gap between the rural and urban area schools, South African curriculum advocates for active learner participation which extends to learner involvement in assessment tasks. In Life Sciences, assessment has its prescribed tasks intended to prepare the learners for a summative assessment and equip them with subject related skills expected beyond schooling. Many teachers use assessment as a tool to inform them of improvement in teaching and learning, as such, they use assessment for different purposes, i.e. assessment for learning; assessment as learning and assessment of learning. This study aims at contributing to the body of knowledge in which some teachers miss out on seeing assessment as an interactive activity which allows them to identify what learners can do independently and assist them with their difficulties so as to take these learners to the next level of understanding.

1.2 Assessment pre and post-apartheid era

Assessment in pre- Outcomes Based Education (OBE) schools was largely driven by the need to produce marks that could be recorded and reported to prove to the relevant authorities that
assessment had taken place, rather than being an integral part of the learning process (Cockburn, 1997). Vandeyar and Killen (2003) attest to the above that teachers generally did not consider assessment until after teaching had occurred. Teachers in most schools could neither link assessment with learner development nor to their own teaching methods improvement. Consequently, high failure rate was experienced, particularly at matric level.

Post-apartheid, a new outcomes driven education system, OBE was introduced. It brought about a paradigm shift in the field of South African education regarding assessment. In an effort to bring equality in the South African education system, in-service trainings were conducted to induct the teachers with the new education practices. The trainings included how assessment should be conducted and incorporated into teaching and learning. In some cases it was not effective as the trainings were short. Contextual and the unequal socio-economic factors hampered uniform implementation of reforms at the classroom level. Vandeyar and Killen (2007) describe the teachers’ experience in the implementation of assessment as poor, lacked meaning and results driven. Life Science, referred to as Biology at the time, was assessed in a similar way. The assessment practices recommended in OBE and later Curriculum 2005 certainly represented significant changes from the practices that were common in pre-OBE schools in South Africa (Vendayar & Killen, 2003). Subsequent to a number of reviews, NCS was followed by the current curriculum, CAPS, in 2012.

1.3 Assessment in CAPS curriculum

CAPS require that assessment be mapped against the content and intended aims specified for Life Sciences in both informal and formal assessments. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching. It should not be seen as a separate entity from learning activities taking place in the classroom (DBE, 2011).

The Life Science teachers in this study have both undergone CAPS implementation training in which policy is discussed and clarity on implementation is made. They are fully aware of assessments of CAPS in Life Sciences and both are compliant. However, their assessment strategies differ in many ways depending on individual traits and contextual factors. Their contexts as it appears, that is, classroom environment, learner commitment, language proficiency of learners, availability of resources, and the atmosphere in general, speak a lot about their classroom practices. Assessment for learning (informal assessment) has the purpose of continuously collecting information on learners’ achievement that can be used to improve their learning while assessment of learning (formal assessment) provides teachers with a systematic way of evaluating how well learners are progressing in a grade and in a particular subject (DBE, 2011). The depth of content and the cognitive demands in the Further Education and Training (FET) phase forces the teachers to break up assessment tasks into manageable parts for the learners.

Airasian (1994) emphasises the importance of sizing-up assessments that teachers do during instruction. Thus, classroom assessment permeates all phases of teaching as commonly practiced (Anderson & Palm, 2017). As indicated in DBE (2011) CAPS document, the cognitive demands in assessment should be appropriate for the age and developmental level of the learners in the grade. Assessment in Life Sciences must cater for a range of cognitive levels and abilities of learners. The assessment tasks should be carefully designed to cover the content of the subject as well as the range of skills and the cognitive levels that have been identified in the specific aims (Stiggins & Bridgeford, 1985). This is to ensure that the teacher pause for feedback and reflection.

2. Conceptual Framework

This paper borrows its constructs from theorists such as Lev Vygotsky’s social constructivism as well as Bandura’s self-efficacy and social cognitive theories. Effective cognitive functioning requires reliable ways of distinguishing between accurate and faulty thinking. In verifying thought by self-reflective
means, people generate ideas, act on them, or predict occurrences from them. They then judge from the results the adequacy of their thoughts and change them accordingly. The validity and functional value of one’s thoughts are evaluated by comparing how well thoughts match some indicant of reality (Bandura, 1994). This put emphasis on why teachers needs to reflect, revise their thoughts and take stock of classroom practices and assessment strategies, then put in place a corrective measure if need be to the teaching and learning environment around them.

In alliance with Bandura’s social cognitive work is Vygotsky’s social constructivism, which promotes learning through interacting with environment and those within the environment. The two theories have ‘social’ as a common construct. This construct has a close relation with how learners relate with one another and their teacher in the learning environment. Learning takes place through interaction in a social setting, in this case, a classroom. The classroom environment reflects the classroom instructional process. Formative assessment is not necessarily associated with any particular theory of learning (Wiliam, 2010). However, current conceptualisations of formative assessment are typically rooted in a sociocultural constructivist view of learning (Heritage, 2010a; Pellegrino et al., 2001; Shepard, 2000). This theory of learning, supported by research (Pellegrino et al., 2001), is most compatible with current goals of education, and best explains the processes of effective formative assessment (Heritage, 2010b; Pellegrino et al., 2001; Shepard, 2000). Intertwined with learning is assessment, one of the (if not main) factors that reflect on the teachers’ performance and learners’ progress in the teaching and learning process. According to Brookhart (2003), classroom assessment occurs within a classroom environment or context or climate. Important to creating a classroom assessment environment were the purposes for which teachers used classroom assessments; the assessment methods used, the criteria for selecting them, and their quality; the teacher’s use of feedback; the teacher’s preparation and the teacher’s perceptions of students. The intention thereof reflects teachers’ knowledge of students’ cognitive abilities, assessment principles, teachers’ instructional practices, and their relationships with students. Underlying the assessment environment are (a) a teacher’s attitudes, orientations, philosophy and beliefs about students and the teaching-learning process; (b) the teacher’s training, knowledge and skills in educational assessment; and (c) classroom climate (Pajares, 1992; Porter & Freeman, 1986; Stiggins & Conklin, 1992; Tittle, 1994). At the centre of it all is the teacher’s self-efficacy.

Brookhart (1997) describes meaningful variation among classrooms and patterns within classrooms of assessment practices using the following dimensions; establish form and purpose of assessment, set performance criteria, performance standards, appraise performance, give feedback, and lastly make informed decision on teaching style. In addition to the development of cognitive abilities, classroom expectations through assessment, and social norms should be used as a platform to foster the development of positive attitude towards learning and teaching.

3. Research questions

The research questions which the study seeks to answer are:

(i) How do the contextual factors affect assessment for learning and teachers’ teaching style in Life Sciences?

To what extent does assessment for learning under positive contextual conditions influence the improvement of learner performance in Life Sciences?

1. Methodology

This study followed an exploratory case study approach. Data were collected qualitatively through semi-structured interviews, lesson observation and document analysis that allowed an in-depth exploration of classroom practices, using multiple forms of data collection (Creswell, 2003). Classroom observations were focused on how the two teachers conducted their lessons in their contexts. Teachers’ lesson plans and their learners’ answer books were scrutinised. These documents were gathered for analysis and to establish both quantity and quality of exercises given by the teachers as well as the general performance and frequency of attendance. The whole process as emphasised by
Reige (2003) ensures the importance of reliability and validity of a research study. These various methods were employed in order to triangulate the data collected (Straker, 2009) and to increase trustworthiness (Flick 1998). Trustworthiness of the data was further achieved through credibility and confirmability procedures (Golafshani, 2003). Interviews were done individually and audio-recorded to ensure that the captured information correctly reflected teachers’ views (Shenton, 2004). Through this design we were able to work closely with the participants in their own territory. This methodology allowed the researchers to gain an in-depth understanding of the challenges of teachers teaching in disadvantaged schools.

4.1 Sample

Participants. The sample consisted of two public high schools FET teachers and their two Grade 12 classes who participated in this study in collaboration with the university-based authors, as critical friends. Each school had one Grade 12 class specialising in Life Sciences. The male teacher named John (pseudonym-not his real name) belong to semi-rural school and the female teacher named Mary (also not her real name) belong to the semi-urban school. John’s Grade 12 Life Sciences class had 55 learners (14 males and 41 females) while Mary’s Grade 12 Life Science class had 26 learners (9 males and 17 females). School A (semi-rural school) was situated in the village 103 km from the provincial capital of the North West province and school B (semi-urban school) was situated 7km from the district office in the capital city of the North West province. The two sampled schools in this study were characterised by different contexts. The sample was purposively selected from one district of the North-West province of South Africa which was deemed to be a partly rural and urban, displaying good performance and contributing significantly to the overall performance of the province in matriculation examinations. Purposive sampling is a non-probability sampling method whereby only those people a researcher thinks would provide the relevant information are selected. In this case, one semi-rural and one semi-urban schools located in different contexts were selected. Both teachers are professionally qualified to teach Life Sciences however they differ in their experience of teaching Life Sciences. John has an experience of 6 years in teaching and Mary has 10 years’ experience. John has been in one school ever since he started teaching while Mary is now in her second school.

4.2 Data Analysis

Data gathered were thematically analysed using inductive analysis. Document analysis was used to analyse documents such as lesson plans and learners books. Text was reduced to its smaller components and systematically analysed enabling one to understand inter-relationships within the text and their underlying implications.

5. Results and Discussion

In an attempt to address the research questions, the following results are presented. The questions focused on how the contextual factors affect assessment for learning and teachers’ teaching style in Life Sciences; as well as the extent to which assessment for learning under conducive contextual conditions influence the improvement of learner performance in Life Sciences. School A is located in a semi-rural area. The infrastructure appears unmaintained. The classrooms are not well looked after, both the teachers and learners still use pit toilets. The contextual factors in John’s environment had a negative impact on his productivity. The school’s track record of summative assessment was not good; the subject Life Sciences was ‘trapped’, performance was below 50% in the previous year. Due to his exposure to the kind of working environment; John has lost the enthusiasm and interest in taking his career further. That, he expressed as follows: “I was hoping to impart the knowledge that I gained from my career as a teacher in the best way possible than how I was taught at school level. However, it looks like I will do exactly what I tried to avoid. Life Sciences is a science subject and requires that we do practicals, but in this school I only do theory”.

John’s experience seems to have defeated his ambition regardless of the fact that he was yearning for development to improve his teaching style and the learners’ performance. However, contextual
factors such as an overcrowded class and discipline hampered his willingness to perform his duty to the optimum. John could not remedy the situation even after he reflected on his teaching style. Though he complied with the common practice of using formative assessment to prepare the learners for assessment of learning (summative assessment), he could not be certain that it will be effective. The study therefore found out that John could not enjoy the benefits of using assessment for learning to improve his teaching style nor the learners’ performance. To answer the first research question using John’s experience: assessment can influence the teacher’s teaching style, however, not under such conditions and without support.

Meanwhile Mary in the semi-urban school had all the necessities to executive her duty to the optimum. The results were annually above 80% and sometimes at 100%. Her working environment is conducive for optimum effort. Ramnarain (2014) asserts that though the teacher lies in the centre of effective science curriculum delivery, the environment in which a teacher works is also significant. Mary complies well with CAPS curriculum requirements. She administers assessment for learning as well as assessment of learning as required and beyond.

She reiterated that she relied most on assessment for learning as it is one of the tools that assist her to take note of learners’ progress on the topic or concept before moving further. When asked to share her secret, Mary said: “I always pause for debriefing so as to allow learners to ask questions, and we relate the topic of the lesson to a practical situation. That talk in itself helps me to assess the ‘atmosphere’”.

In Mary’s case, the first research question’s answer is clear; the conducive environment that exist in her school allows for the success of assessment for learning. The support she got, enabled her to make informed decisions from learners’ assessment results to find the suitable teaching style and optimise her effort. The tasks that she had given her learners were marked, projected good performance. That bears witness to all her responses to the interview questions. Through probing during the interviews, the second research question was also well answered. Through the two teachers’ responses, it came out clear that assessment, if done accordingly alongside teaching and learning, done on continuous basis, for the purpose of preparing the learners, and more, has a great impact on improving learner performance. Observably, the urban school teacher was highly committed and drew her strength from her learners’ eagerness to learn. She has positive attitude.

The kind of classroom evoked by the sociocultural constructivist theory of learning is one in which teachers and students share responsibility for learning (Heritage, 2010a; Tunstall & Gipps, 1996). The teacher of the rural school had a lot on his plate. Most of the teaching time was lost on trying to discipline the class. He could not fully interact with those learners who were willing to listen. Most of the teaching and learning activities were only done in part. It was evident from lesson observations and document analysis that positive environment promotes best learner performance. However as noticed through this study, not every school in this country has the kind of context that encourage teachers to strive for excellence in improving their daily practices and promote sustainable best learner performance, including in Life Sciences. It cannot be over emphasised that assessment has a great influence on learners’ performance, however only under conducive contextual conditions. For assessment for learning to yield positive results conducive contextual conditions (Brookhart, 2003) must be observed. Factors such as those of school A, can seriously defeat the purpose of assessment for learning. Thus this study agrees with Brookhart’s opinion of the influence of context on assessment and instructional process.

6. Conclusion

The findings of the study revealed that teachers who use assessment for learning tend to adequately and gradually prepare their learners for assessment of learning. The study also indicated that factors such as incorporation of assessment in the teaching and learning process, learning environment and the teaching style has a great influence on learner performance. CAPS curriculum draws its classroom practices from constructivism. However as it appears, there are still schools in the same
neighbourhood, districts and in one country, which have not tasted the benefits of this theory. The challenges in some schools are ignored and persist beyond repair. Performance of learners gets affected by the teacher’s demoralisation. The kind of environment (context) the learners and the teachers of certain schools such as school A find themselves in, influences the results, learners’ behaviour and the teachers’ lack of good instructional practices. The results thereof tend to tarnish the image of those teaching in such contexts. The paper concludes with a recommendation that assessment be accepted by all as the most important tool for effective teaching and learning. In sum, this study carries evidence that assessment for learning can if incorporated by the teachers during the teaching and learning process, improve learner attainment.

Reference


