

B. Mantyi-Ncube, T.P. Ndlovu, N.S. Moyo and W.Sibanda: The examination system as a measurement tool for providing reliable information on quality of education in skills-based subjects: a review

THE EXAMINATION SYSTEM AS A MEASUREMENT TOOL FOR PROVIDING RELIABLE INFORMATION ON QUALITY OF EDUCATION IN SKILLS-BASED SUBJECTS: A REVIEW

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ABSTRACT

Educational systems world-over rely on examination systems and any actions undermining examinations pose a great threat to validity and reliability of examination results and certification. Factors such as teacher competency and suitability, availability of funds, quality of management and supervision of schools and changes in examinations are inter-linked and key to success of any educational reforms and curriculum changes. Teacher skills and knowledge are important considerations, together with the level of support from school administrators, supervisors and the availability of resources. The examination process in many countries, unfortunately, has become a “contemporary shame” because of the examination malpractice that has become endemic in educational systems to the extent of undermining the validity, reliability, and authenticity of examinations and ultimately the integrity of certificates issued. This paper therefore, attempted to review studies done on examinations and assessment techniques used, and the challenges faced in attempts to ensuring that examinations remain valid and reliable measurement tools of competencies attained in skill-based subjects. Portfolio assessment is recommended as providing alternative and authentic mode of assessment for skill-based subjects. Introducing its use would add to examination techniques currently used and thus help as a better measure tool of skills and competencies achieved for quality education.

Keywords: practical subjects, portfolio assessment, skill competency, management and supervision

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INTRODUCTION

Educational systems world-over rely on examination systems. In many education systems assessments results are used as indicators of school achievement. To date, examinations still remain the best tool for objective assessment and evaluation of what learners have achieved after a period of schooling. With the Southern African region undergoing educational reforms and curriculum changes in an attempt to make the curriculum more relevant, there are several other factors that impact on examinations. Therefore, success of these reforms depends on these factors which are teacher competency and suitability, availability of funds, quality of management and supervision of the schools and changes in examinations (Olatunbosun, 2009). The vital role of Vocational and Technical Education (VTE) in the production of skilled and competent manpower for economic, industrial and social development cannot be achieved if efficient and effective teaching and examination is not maintained. This paper therefore, attempted to review studies done on examinations and assessment techniques used, and the challenges faced in attempts to ensuring that examinations remain valid and reliable measurement tools of competencies attained in skill-based subjects. Furthermore, this paper examines the objectives and factors militating against quality teaching and examination of skill-based subjects in VTE for purposes of quality assurance in the teaching and examination of vocational and technical education. Teacher skills and knowledge are important considerations, together with the level of support from school administrators, supervisors and the availability of resources (Idialu, 2007).

Although teachers play a major role in teaching and learning, 'quality education' is dependent on many factors. Thus, the concept of "education quality" can be considered to include the following:

- *What learners should know* – in the curriculum and performance standards;
- *Where learning occurs* – e.g. class size, availability of resources and facilities to support learning;
- *How learning takes place* – learner and teacher attitudes towards learning; and
- *What is actually learned* – knowledge, skills, competencies, attitudes, and values that learners acquire (Braun, *et al.*, 2006).

TEACHING VOCATIONAL AND TECHNICAL SUBJECTS

Curriculum in its generic form is a *plan for learning*, and is perceived as more than just a list of subjects and subject syllabi which entails three major questions: '*what to learn, how best to learn and to teach, and how best to enable teaching and learning*'? Furthermore, it is both at the heart of the mission and vision of the school and that of the learning experience a school offers its learners, through the development of learners' understanding, knowledge and skills. (Gaobakwe, n.d.; Bregman, 2008).

Vocational education is the aspect of education, concerned with the preparation of skilled manpower, a form of education, training or retraining directed towards developing the learner to become productive in a paid employment or in self-employment; and, it offers instruction in skilled trades, that is, the practically-biased subjects. It is therefore the bedrock in which

a country's socio-economic, technological and cultural advancement must be built (Idialu, 2007). Considering that objectives of VTE are more for the acquisition of specific skills, rather than mere accumulation of theoretical facts, educators the world over are continually increasing opportunities for the preparation of individuals for gainful employment. On the contrary, the practice in many schools today is to instruct students on how to *carry out* some skills but never providing them with the opportunities for practical application of their learning of skills in the schools. For this trend to change, Governments need to place importance on vocational subjects, and give enough support for the proper teaching of the various subjects. To achieve the objectives of vocational and technical education there is need to ensure good quality teaching and evaluation of students' work. This is crucial to helping students achieve high academic standards; improving quality and examination of vocational and technical education has become very necessary because most people who pass through training in this type of education have inadequate competence skills and therefore, are unable to perform adequately (Odu, 1992; Idialu, 2007).

Effective learning and teaching of Home Economics

Home economics (HE) courses, as skill-based subjects are to address pupils' vocational needs' development of knowledge, and practical skills. These skills will have life-long relevance for all learners and equip them for a range of worthwhile pursuits...in the world of work. The teaching of specialist skills and techniques in HE should result in possession of basic practical skills, added to an understanding of essential knowledge and concepts. 'Recent curriculum reforms in sub-Saharan Africa

(SSA) have focused on modernising teaching methods in the classroom, away from teacher-dominated classrooms to more active forms of learning, such as learner-centred approaches' (Bregman, 2008). The learner-centred approaches to the teaching of practical skills, are improving the effectiveness of learning; "varied approaches of teaching, well-matched to lesson purposes encourage pupil participation and independence as learners" (Gallacher, 1997-1999, p. 3). Performance-based tests and examinations give a good indication of the mastery of the specialist skills and techniques acquired in the HE skill-based subjects.

Competence-based Education

Mkhwananzi, *et al.*, (2011) stated that, the Ministry of Education and Training in Swaziland developed a new policy influenced by the World Bank Study, then pronounced that competence-based education (CBE) be implemented in schools by 2016. The strategic plan recommendations were the introduction, and adoption of competence-based education, curriculum and standards framework for the Technical and Vocational Education and Training Skills Development (TVETSD). The CBE results in skill-based instruction and training with an emphasis on life-skills, and evaluation of mastery of those skills according to learner-performance. It is a performance-based process leading to demonstrated mastery of basic life-skills necessary for the individual to function proficiently in society and the notion of CBE fits well within policy discourses of employability and life-long learning.

Success in empowering learners with knowledge, skills and attitudes that are sustainable requires teaching and assessment promoting practices that meet the present learners' needs, thereby preparing them to

meet their future needs; this encourages and also helps students develop their own learning and assessment resources. In preparing learners for life-long learning, critical thinking skills are required for young people to select relevant information and evaluate its accuracy for purposes of application. Mazibuko (2011) stated that “--- we are shaped and defined by our assessment results, therefore we should try to make sure that their impact is as constructive as possible in terms of what is taught in preparation for assessment and what students carry away from the course that is examined for the future” (p. 313). Therefore, this calls for sustainable teaching and assessment to develop a deep understanding of the subject matter and make grades better signifiers of what knowledge and skills students have learned. ‘The implications being for curriculum design, subject content, learning outcomes and skill development, pedagogy, quality assurance, and assessment which are all intertwined and interdependent’ (Mazibuko, 2011; pp. 313-318).

Vocational Teachers and teacher skill competencies

From Ndjabili’s (2004) study, for many teachers in SSA, the critical determinant of effective teaching, namely, knowledge of the subject matter; pedagogical skills and motivation are acutely lacking, although teachers are in the frontline of educational reform programmes. Often innovations and reforms have been introduced in education systems without having ensured that human resources and material resources are in place. Rapid expansion of enrollment resulting in shortage of qualified teachers and use of unqualified secondary school leavers as so-called “relief teachers”, impacts on curriculum quality thereby reducing the already low levels of

teaching/learning activities in SSA classrooms, this is compounded by lack of adequate physical structures (Ndjabili, 2004). Effective teachers of vocational and technical subjects should be characterised by the following:

- Teachers require a sound education, ‘right type and sufficient training’ in their area(s) of specialisation, in order to be well-equipped as well as have superior knowledge to that of the pupils, so as to impart adequate knowledge;
- Vocational subjects teachers should remember that people learn by doing hence practical/laboratory or workshop experiences are most valuable for these subjects; and
- Effective instruction involves continuous evaluation to assess students’ achievements, and also enables making adjustments in relation to content and teaching methods. Evaluation of pupils’ needs before instruction is necessary and continuous evaluation of progress made towards set goals, provides the basis for planning new goals (Odu, 1992).

Teacher attitude, skills, knowledge and remuneration play a significant role in the manner teachers engage themselves in the vocation of teaching students. Teacher knowledge and practices are the primary factors affecting the improved students’ learning outcomes. The change in instructional processes depends on the following: teachers’ professional development; teacher’s training background which has a direct positive effect on teachers’ knowledge and practices; curriculum consistency, alignment of curricula with assessment and examinations; and, the interaction between all factors

further influence instructional practices. Skill acquisition by vocational teachers must be consistent and emphasis should be on competency. It is apparent that “teachers cannot provide experience and activities that guide students’ progress towards understanding of ideas if they themselves do not know what these ideas are; neither can they provide experiences that challenge students’ understanding if they themselves share the same misunderstanding. You can only give what you have which implies that you teach what you know or can perform” (Mazibuko, 2011, p. 318; Idialu, 2007, p.2; Olatunbosun, 2009, p.105).

Furthermore, to ensure quality assurance in teaching and examination of students in vocational technical studies requires services of high quality teachers who are ready to effectively impart high quality knowledge, and skills’ competencies that are required in vocational technical education. Thus, this implies that greater emphasis should be placed on teacher professional development within a whole school development or improvement strategy alongside a greater focus on curriculum, instruction and performance standard of pupils. Teacher Education should aim at producing high quality teachers who are well-equipped with variety and effective ways of teaching in and out of school setting. There should also be opportunity to train the “untrained”, and retrain the “trained”. A system of feedback should be devised to monitor deficiencies present in Vocational Teachers, and effort made to remedy such lapses through seminars, workshops, in-service training, etc. It is important that teacher empowerment be not limited to professional development alone; it should cover a reward system with attractive remuneration packages consisting of a robust salary structure; and, the job environment should

be enriched and made conducive to make the job interesting and worthwhile. These put together will enhance the teacher’s image and commitment to his/her job. The Nigerian Academy of Education Report (2004) cited by Olatunbosun (2009) showed that “teacher commitment was severely affected by their level of job satisfaction, as teachers were most dissatisfied by their workload, school facilities and services, professional development and reward system” (p. 105).

Inadequate equipment and infrastructural facilities for teaching and learning

The inadequate funding of the public school system is the cause of other problems that have undermined the quality of education in developing countries (Olatunbosun, 2009). The shortage of equipment and facilities affects the quality of teaching and learning, Quality diminishes when the facilities required for imparting and learning are inadequate or not available. Idialu (2007) remarked that the condition under which vocational education is imparted is poor. Most secondary schools and Vocational Technical Teachers’ tertiary institutions lack teaching materials, equipment, and money to maintain the existing equipment, lack workshops and workshop facilities, have ill-equipped laboratories and libraries. Idialu (2007) stated that, for technical institutions to perform their educational and training assignments properly and thus produce the right calibre of people that can win the respect of industry and public, they need to be adequately equipped. Vocational Technical Education (VTE) is practical-orientated; the absence of equipment and facilities due to inadequate funding is bound to affect the competence of the products and subsequently the implementation of vocationalising the secondary schools.

Quality teaching and examination of VTE can only be implemented with competent Vocational Technical Teachers, and adequate equipment. This is supported by Ngware and Nafukho (2002), wherein respondents indicated that adequate basic teaching materials (i.e. chemicals, stationery, textbooks, cloth, and chalk, etc.) improve internal efficiency of training institutions by enabling them in producing a graduate with required technical knowledge and skills. On the other hand, basic teaching equipment (i.e. welding machines, motor machines, computers, typewriters, and projectors) was looked at in terms of ability to produce quality work. The VTE prepares its recipients for the world of work and so the students are supposed to be exposed to a work environment which will enable them to fit in and outside the school environment.

Supervision and inspection of schools

The contention by many people, that the standard of education has fallen or is falling, is believed to be the result of inadequate supervision of education. Supervision, as an integral part of school administration must be well articulated for the development and growth of both teachers and learners. Thorough and adequate supervision and inspection in vocational education is crucial for the effective running of practically-biased programmes; without adequate school supervision there cannot be improvement of instruction (Odu, 1992). Instructional supervision, an essential part of school administration, involves all efforts of designated school officials toward providing leadership to teachers in the improvement of instruction and the evaluation of instruction. Traditionally, the Inspector was an official of the Ministry of Education – who, as the controller of education, conducted periodic inspections wherein schools were visited, examined and evaluated as places of

learning and advice embodied in a report given for improvement. The Inspectorate Division within the Ministry of Education is solely responsible for the conduct of inspection of education in the schools. The Chief Inspector of Education (as the chief adviser on professional aspects of education) heads the division with the assistance of area/district inspectors. Regular periodic inspection of centres, instructors/teachers and pupils by competent inspectors for identifying strengths and weaknesses in the system is of utmost importance in providing mentorship for the school programmes. Inspectors' role involves critically examining the set-up of a learning Centre, mentoring through highlighting positive and negative aspects of the conduct of lessons and offering sound advice. Furthermore, inspections of student's performance in practical subjects ensure the development of competencies and skills required for success in future careers and ultimately successful vocational programmes (Oyesola, 1992; Anonymous, 2008).

Inspectors' reports help in advising about timetabling for adequate teaching time of the respective subjects and also in ensuring that class periods for practical subjects are allotted to adequately equipped laboratories for group activity. Good supervisory work and/or periodical inspection keeps systems functioning as they ought to. It also ensures there is competent staff to teach the proposed courses, and the availability of essential and adequate facilities for practical/vocational subjects; and, it also keeps the staff awake to their task of teaching in order to obtain high standards. Thus, inspection provides positive reinforcement. School supervisors and inspectors should not be mere critics and negative in approach but should adopt a positive approach. Constructive criticism helps bring about changes. Even though

these supervisors and inspectors need not be negative in their approach, they would fail to help students, teachers, schools and the society if they overlook mistakes or apparent lack of forethought or thoroughness on the part of teachers and instructors (Odu, 1992; Anonymous, 2008).

Leadership and school performance

"Possibly the most important single factor in school effectiveness is the quality of teaching. Education, however, is far more than the sum of contributions of individual teachers... it demands good leadership and sound management which have a significant effect on pupils' learning" (Gallacher, 1997-1999, p. 1). Leadership, a pivotal force behind successful organisations is about challenging and inspiring others to commit to actions resulting in accomplishment of intended goals. Leadership, a collaborative, flexible and empowering process; creates conditions that enable teachers, parents, and even students to take ownership of tasks. School head teachers and college principals are responsible for ensuring effective teaching and learning. Leadership and performance are linked together; leaders inspire support staff to discharge their assigned tasks and thereby perform their duties beyond expectations (Dube and Dlodlu, 2011). Principals, as highest-ranking school/college administrators, are primarily responsible for the overall operation and management of schools; and for the efficient and effective functioning of the school system. Furthermore, as managers principals are responsible for financial operations, building maintenance (e.g. school safety, ensuring that facilities and equipment are safe and in good working condition), student scheduling, personnel, public relations, school policy regarding discipline, coordination of the instructional programmes, and other overall school

matters. The management role of curriculum and instruction supervision, makes principals/head teachers responsible for teaching and learning in their schools in monitoring instruction thereby helping teachers improve their teaching and instructional techniques (Muzvidziwa, 2011; Anonymous, n.d.). The school climate affects examinations, and thus examinations are not to be looked in isolation; many of the above-listed factors impact on the examination system and the results outcome.

TYPES OF ASSESSMENT

Multiple-choice tests

"Large classes, due to increases in student enrollment have seen to more academicians using multiple-choice questions as a matter of expediency; unfortunately, in some cases, the quality of the assessment being neglected" (Woodford and Bancroft, 2004, p. 948). As noted by Considine and Botti (2005, p. 19), "poor performance in an examination or test using multiple-choice questions has the potential to thwart achievement of an academic qualification and as a consequence impact adversely on career pathways". A notable concern of many teachers is that they frequently have the task of constructing tests but have relatively little training or information to rely on in this task. Moreover, setting multiple-choice tests that go beyond the recall level is difficult. For multiple-choice tests, the *stem* is the introductory question or incomplete statement at the beginning of each item and this is followed by the options. The *options* consist of the answer – the correct option--and *distractors*--the incorrect but tempting options (Rudner and Schafer, 2002, p. 61). Despite the difficulty of setting good quality multiple-choice test questions, studies indicate that "it is possible

to construct multiple-choice questions that are able to test higher levels of cognition which are comprehension, application and analysis levels" (Woodford and Bancroft, 2004, p. 946). Furthermore, there are significant gains to be made for both educators and students from appropriate deployment of multiple choice questions. Studies indicate that, being able to set good questions which test higher cognition allows teachers to use multiple-choice questions in end of semester summative tests with confidence not just as formative assessment (Roberts, 2006; Woodford and Bancroft, 2004, p. 954).

Performance-based assessment

It is difficult to write multiple-choice tests that go beyond the recall level and because of this, educators have advocated the use of performance-based assessments. Performance-based assessments "represent a set of strategies for the . . . application of knowledge, skills, and work habits through the performance of tasks that are meaningful and engaging to students" (Rudner and Schafer, 2002, p.65). This type of assessment provides teachers with information about how a child understands and applies knowledge. Also, teachers can integrate performance-based assessments into the instructional process to provide additional learning experiences for students. An active learning approach provides a structure in which a series of activities/experiences support many learning opportunities. The performance criteria describe what a 'competent', 'able' or 'employable' person is or can do (Mkhwananzi, *et al.*, 2011).

In order to administer any good performance-based assessment, teachers must have a clearly defined purpose. Thus, several important questions must be asked:

for example, "*What concept, skill, or knowledge am I trying to assess?*"; "*What should my students know?*"; "*At what level should my students be performing?*" and, "*What type of knowledge is being assessed: reasoning, memory, or process, etc.?*" (Rudner and Schafer, 2002, p.65). By answering these questions, this helps the teacher/instructor to decide what type of activity best suits the assessment needs. Things to be taken into account before one chooses the activity are: time constraints, availability of resources in the classroom, and how much data is necessary in order to make an informed decision about the quality of a student's performance. Performance-based assessments require individuals to apply their knowledge and skills in context, not merely completing a task (Rudner and Schafer, 2002).

Scoring criteria for assessing performance

Use of scoring rubric/criteria for assessing student performance is crucial. A rubric is a rating system used by teachers to determine the level of proficiency a student is able to perform a task or display knowledge of a concept thus, giving different levels of proficiency for each criterion. Having clearly defined criteria list with skills/concepts to be applied to the performance-based assessment makes it easier to remain objective in conducting the assessment; and thereby enabling two independent evaluators to assign the same score to a given response (i.e. "rater reliability") (Moskal, 2000). Scoring rubrics are descriptive scoring schemes developed by teachers or other evaluators to guide the analysis of the products or processes of students' efforts; and, usually employed when a judgement of quality is required; and when used to evaluate a broad range of subjects and activities. Having a description

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of the characteristics of responses within each score category increases the likelihood of ‘rater reliability’ (Moskal, 2000; Rudner and Schafer, 2002).

Validity and reliability of assessments

“Validity and reliability are interdependent. High validity and high reliability are more likely to be achieved through measuring candidates against outcomes of learning which have clearly defined performance levels; use of assessment instruments that are appropriate to the outcomes; and, minimizing subjectivity” (Anonymous, 2009, p.9). Interpretations of tests results are indicative of the value placed on test grades as opposed to the knowledge acquired. Results of a well-constructed and reliably marked test that are used wrongly or misinterpreted, deems the assessment invalid, e.g. results of a well-constructed math’s test used as a sole criterion for selection to a music course, would not be a valid selection tool since someone’s music ability cannot be inferred from a math score. Test dependability encompasses construct validity, reliability and manageability (Mazibuko, 2011; Anonymous, 2009).

Validity is a measure of the accuracy of an assessment and refers to the degree to which the evidence supports that the manner in which interpretations e.g. inferences and actions based on test scores or other modes of assessment are used is appropriate (Anonymous, 2009; Braun, et al., 2006). *Validity is the most important characteristic to consider when constructing or selecting a test or measuring technique. Thus, validity must always be examined with respect to the use which is to be made of the values obtained from the*

measurement procedure. Three types of evidence commonly examined to support the validity of an assessment instrument being: content, construct, and criterion; to be used in guiding the development of the scouring rubric with reference to stated purpose and objectives. To elicit evidence of an individual's knowledge within a given content area (e.g. historical facts), appropriateness of content-related evidence should be considered. Reasoning, problem-solving or other processes internal to the individual requires appropriateness of the construct-related evidence to be examined. For criterion-related validity test scores should predict future performance, outside of school or in a different situation, on some valued measure other than the test itself (e.g. arithmetic test results may have a high degree of validity for indicating skill in numerical calculation, a low degree of validity in indicating general reasoning ability, and no validity at all for predicting success in art or music. (Rudner and Schafer, 2002, p.80; Ross, 2005, p.40).

Reliability is a measure of the degree of consistency (e.g. of assessment scores). Reliable assessment decisions on candidates’ performance must be consistent across all assessors for all candidates for the same assessment task. For example, on a reliable test, a student would expect to attain the same score regardless of when the student completed the assessment. On an unreliable examination, a student's score may vary based on factors that are not related to the purpose of the assessment. The two forms of reliability typically considered

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in classroom assessment involve rater (or scorer) reliability. Rater reliability generally refers to the consistency of scores that are assigned by two independent raters ("interrater reliability") and that are assigned by the same rater ("intrarater reliability") at different points in time (Rudner and Schafer, 2002; Anonymous, 2009).

Scouring rubrics provide formalised set criteria at each level to guide the rating process of two independent raters in the evaluation process i.e. "Interrater Reliability" to avoid subjective judgement of instructors. Intrarater Reliability refers to factors external to the purpose of the assessment that can impact the manner in which a given rater scores student responses. Inconsistencies in the scoring process result from influences internal to the rater rather than true differences in student performances (e.g. a rater may become fatigued with the scoring process and devote less attention to the analysis over time, etc.). Use of well-designed scoring rubric with well-defined score categories respond to the concern of intrarater reliability and assist in maintaining consistent scoring regardless of who the rater is or when the rating is completed and thus improve both interrater and intrarater reliability (Rudner and Schafer, 2002, p.83). Reliability is a necessary but not sufficient condition for validity. A test which provides totally inconsistent results can not possibly provide accurate information about the behaviour being measured. It is important to note that reliability refers to the

nature of the test scores and not the test itself. Any particular test may have a number of different reliabilities (Ross, 2005, p.41).

ASSESSMENT TECHNIQUES AND EXAMINATIONS

The examination process in many countries, unfortunately, has become a "contemporary shame" because of the examination malpractice that has become endemic in educational systems to the extent of undermining the validity, reliability, and authenticity of examinations and ultimately the integrity of certificates issued. Examination malpractice is not peculiar to Africa but is a global issue; as has been widely reported, parents and teachers aid and abet examination malpractice directly or indirectly. Parents go to the extent of bribing their way through to ensure unearned grades while teachers encourage examination malpractice because they lack the zeal to work but want to be praised for a job not done (Olatunbosun, 2009, p.104).

Assessment is the process of evaluating an individual's learning, through generating and gathering evidence of a learner's attainment of knowledge and skills and judging that evidence against defined standards (Anonymous, 2009). This process further refers to all instruments applied to measure students' achievements; the so-called norm-referenced and criterion-referenced formal examinations, and continuous assessment. Assessment is an integral part of courses and effective assessment is generally well-matched to course objectives and uses a performance criterion. Assessment encompasses techniques such as teacher observation and classroom discussion, analysis of student work, and these have an important place alongside analysis of tests and homework (Boston, 2002). School-based assessments,

referred to a ‘Continuous Assessment’ (CAs) allow teachers to measure learner progress and diagnose weaknesses to enable remediation and focused teaching. In the form of formal tests, projects and assignments the CAs provide crucial feedback on what learners know relative to what they should know. Furthermore, forms of assessment need to be appropriate to the subject of learning being tested, and to the level of learning, in short, assessment requirements spell out for teachers what they should teach, at what level and how they can ascertain whether the learning has been attained. ‘Innovative’ types of assessment such as projects, research, peer-assessment and group work should be used for variety and multiple methods of assessment tasks are more effective in gathering evidence of learner progress (Motshekga, *et al.*, 2009).

Empowering learners through sustainable teaching and assessment practices

Developing sustainable teaching and assessment approaches with potential of empowering learners with a deep understanding of the subject matter, and the development of useful lifelong-skills depends largely on teachers’ orientation and skills. The dominant tradition of “past-paper” teaching practice and recall tests wherein an assessment is highly predictable from year-to-year encourages teaching practices that focus on past papers and the practicing of answers to previous tests. The problem with this trend is that very little in terms of knowledge and skills are carried forward. It is not sustainable, especially when assessment has limited validity or weak representation of the intended skills. Unfortunately, this produces surface learning that is not sustainable beyond the test and a threat to validity of such tests as they are measuring something other than what they claim to measure. The above is

affirmed by Mazibuko (2011) who stated the following:

“...even though students have never learned the concepts on which they are being tested. As teachers become more adept at this process, they can even teach students to answer correctly test items intended to measure students’ ability to apply, or synthesise, even though the students have not developed application, analysis or synthesis skills” (p. 314).

Cognitive assessment: Authentic assessments and tests induce the education system curricular and instructional changes that foster development of the cognitive skills, an essential part of sustainable assessment. Some assessment systems use Bloom’s Taxonomy as a hierarchy of cognitive demand from knowledge through comprehension, application, analysis, and synthesis to evaluation. An analysis of teachers’ tests using this framework will often identify how many questions are at the lowest level, recalling knowledge rather than showing its understanding. There is need to encourage ‘principled’ knowledge through less predictable questions. The goal of tests should be on the use of questions that prepare learners for application of knowledge and thus encouraging more active student involvement and a problem-solving outlook which may better serve students in their unknown future (Mazibuko, 2011).

Instruction in cognitive areas and assessment of students’ level of understanding assists students in practicing and mastering skills outside the

vocational/technical education classroom. Implementing quality assessments in the cognitive domain is challenging for teachers. Quality cognitive assessment indicates that assessment activities should be continuously infused throughout various lessons within the unit. Teachers who observe student performance and immediately provide feedback (affirmative assessment process) are effectively and efficiently assisting their students' progress towards the goal of increasing their cognitive understanding. When teaching and assessment occur more simultaneously, assessment becomes integral to the learning experience. Researchers concur that "when all the testing is done at the end of a unit, neither the teacher nor the student can make useful modifications to improve performance" (Worrell, *et al.*, 2002).

Affective assessment: is helpful in giving insight into students' motivation, attitude, autonomy; it is argued that these factors may be as important to student success as academic skills and preparation assessments that measure various student attributes and characteristics (e.g. critical thinking and reasoning skills assessments; learning preferences and styles) relating to an individual's general inclination towards receiving and processing new information. Although the affective domain is difficult to assess from the standpoint of achieving valid, reliable and objective measurements, Levine-Brown, *et al.*, (2008) stated that identifying and understanding these preferences are key factors in helping students become aware of how they learn. According to Worrell, *et al.*, (2002), a number of barriers exist in efforts to conduct effective and appropriate assessment of the affective domain (i.e. elements of attitude encompassing the interests, appreciation,

attitudes, value and emotional biases of students and interpersonal interaction, etc.).

Performance-based examinations for practical subjects

Authentic assessment: Fook and Sidhu's (2010) study reported alternative and authentic assessments as more acceptable to students and an alternative to traditional standardised assessment. The traditional paper-and-pencil tests are seen as no longer covering the variety of activities and tasks that take place in the classroom. An evaluation on students' overall performance is needed to make informed decisions regarding students' learning abilities, their placement in appropriate levels and their achievement. This includes the quality or achievement in tasks such as tests, projects, reports and examinations. Therefore, assessment procedures are useful in evaluating the suitability and effectiveness of the curriculum, the teaching methodology and the instructional materials...; only high quality assessment, though, can facilitate high-quality learning (Fook and Sidhu, 2010). "The more authentic the assessments are, the more confident we can be that a good grade represents good skills and understanding" (Mazibuko, 2011, p.317).

Caution has been noted on the current assessment in education as inadequate in preparing students for a lifetime of learning, and suggestions are for use of more sustainable assessment that can aid students to become more active learners, not only in managing their own learning but also assessing themselves for life beyond the end of the course. The use of a variety of assessment techniques each with a given weighting, such as portfolio assessment (20%), collaborative project work (40%) and a test (40%) etc. is more beneficial for the students. The purpose of assessment should be to equip learners with skills and competencies needed to succeed in today's

workplace. Variety in assessment methods ensures emphasis on performance tasks and on-going formative assessment by giving students tasks that are 'real' and to a great extent mirror the knowledge, skills and competencies they would need in their future workplace. These performance-based assessments provide information on how students perform on each of the specific criteria that make up a more general performance or product (Fook and Sidhu, 2010).

Projects, as authentic assessment assignments require good planning, and clear guidelines with the 'formulation of explicit expected learning outcomes needed' to guide students to do their assignments, so that suitable tasks can be constructed to measure the intended knowledge, skills and understanding, while minimising the influence of irrelevant/ancillary skills. More importantly, assignments should require students to synthesise knowledge and skills learnt in the classroom and apply them for 'real' situations in their future workplace, thus making students to be more marketable. This provides valid, reliable and useful information concerning student achievement; types of assignments, individual, pair work or group work, allocation of marks and guidelines of conducting their assignments should be provided to students (Fook and Sidhu, 2010).

Portfolio Assessment: is means of evaluating students' samples of work to make decisions based on their performance, provide performance-based assessment strategies for long duration in-depth assignments; it is artifacts that provide real-world preparedness demonstrating the mastery, comprehension, application and synthesis, of a given set of concepts. To create a high quality portfolio, students must

organise, synthesise, and clearly describe their achievements and effectively communicate what they have learnt. A student's portfolio is usually comprised of work that is either the student's best or most exemplary of his/her ability. A portfolio may also contain papers which show the evolution of a particular writing assignment or project (Matthews, 2004; Hill & Irvine, 2003; Slater, 1997). Over the years, portfolios have been used as other alternative forms of assessment although they have had only limited implementation (Mazibuko, 2011).

Traditional Assessment: is a "paper-and-pencil test that usually focuses on incremental skills that can be graded objectively. Tests are often multiple-choice and standardised, easily administered and easily graded" (Petty, 2007). Though portfolios have been deemed as unable to compete with the ability of standardised testing to quickly and cheaply determine the overall performance of a school (Matthews, 2004) they are the students' chance to experience "real-world process in contrast to the manipulative, lesson-test model created by standardised tests"; thus, portfolios claim greater validity than any other assessment method. The portfolio classroom is a child-centered one, where teachers trust children to learn - not only from their mistakes but from their strengths as well. Teachers who incorporate portfolios in the mode of instruction "eagerly invite students into the evaluative process" making students better able to take responsibility of their own learning (Petty, 2007).

Teacher competency in assessing skill-based subjects

Reliability is influenced by many factors, for purposes of quality assurance in the teaching and assessment of skill-based subjects,

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teacher skills, knowledge, together with level of support from administrators, and supervisors; and the availability of resources are important as highlighted in the following points:

- Teacher's training background and subject specialisation, skills and knowledge of the subject;
- Knowledge and understanding of the school syllabus and its coverage; and, identified areas of specialisation;
- Good teaching practices and experience in the subject;
- Appropriate resources, and teaching material; and
- Type of inspection and professional development by school administration e.g. HOD, Deputy Head, Head and Subject Inspector (Idialu, 2007; Odu, 1992).

Value of certificates and paper qualifications

According to Treffy and Ferguson (2003) a certificate is an official document attesting a fact or a qualification that endorses completion of requirements of an academic course of study. Certificates should be an indication of a quality, ability or an attribute that makes a person suitable for a particular position or task. Unfortunately, the trend to over-value certificates is a major concern; a lot of value and emphasis are placed on certificates instead of knowledge, skills and competence. The market's tendency of placing value and rewarding of the level and face-value quality of certificates is undoubtedly responsible for the promotion of the acts of cheating in the certification processes. Many school leavers and dropouts have certificates without knowledge and skills. Olatunbosun's (2009) study indicated that "most of the social maladies like manufacture and sale of fake

drugs by pharmacists, collapse of buildings, massive fraud in banks and miscarriage of justice are consequences of over emphasis and value on certificates" (2009, p.105). The author further stated that the perpetuation of such a trend could easily lead countries to end up with "doctors who cannot differentiate between the vein and artery, lawyers who cannot differentiate between an accused person and the complainant and teachers who may not be able to spell the names of their schools correctly. It is high time that developing nations took certificates no more as passports to jobs or higher education; more emphasis should be placed on the competence and skill acquisition. The implication of this is that assessment of students should no longer be based on one almighty examination; rather, it should be continuous, and based on *Continuous Assessment* which is properly implemented from the very first day at school to the very last day" (2009, p.105).

The value system that places emphasis on certificates suffuses the school system with the product of the system that prefers to flaunt certificates and credentials rather than knowledge, skill and competence. "Consequently, students engage in short-cut means of acquiring these certificates during examinations. In the same vein, parental indiscipline and abuse of wealth sustain the phenomenon of examination malpractice. Many parents believe that with their wealth they can catapult their children to any heights in the society even if it involves buying question papers to ensure that their children pass examinations" (2009, p.104). Examination malpractices render the goals of education invalid leading to loss of credibility, internationally. Failure to eradicate the scourge of examination malpractice from the educational system renders the actualisation of educational goals to continually be a mirage. The end

result is production of graduates who lack the knowledge, skill and competence to exploit the resources of the nation. Besides, such graduates will lack the right type of values and attitude needed for survival in a globalised economy and malpractice leads to irreversible loss of credibility (Olatunbosun, 2009).

CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This paper attempted to raise awareness on the important factors contributing to effective teaching and learning, and the multiple assessment techniques that can be used for quality vocational and technical education in skill-based subjects. The shortage of qualified teachers in skill-based subjects is a crucial problem that affects quality teaching and assessment. It is also important to understand the entire range of assessment techniques and methods, with the realisation that each has limitations; and, hence the functions of the different types of assessments are intertwined and together contribute to effective learning (Rudner and Schafer, 2002; Anonymous, 2009). It is therefore, good practice to use a variety of assessment methods, so that pupils' interest and motivation are maintained and individual preferences for different learning styles are catered for. Fair assessment that leads to valid inferences with a minimum of error is a series of measures that show student understanding through multiple methods; thus important decisions should

not be made based on a single test score. Thus, good assessment is valid and uses multiple methods (Rudner and Schafer, 2002).

Although examinations are the selection yardstick, there are often many things that are wrong with examinations, and examiners are known to make mistakes; there is still

much that remains to be done to further improve the quality of examinations because they are used to make very important selection decisions which affect individual lives. There is need to have teaching standards and challenging examinations to document and recognise accomplished teaching. Quality teaching/examinations ensure that candidates possess the knowledge/skills and competencies that are appropriate for their specific disciplines. Practical (vocational and technical) subjects are quite important in any education system and there is great need to equip school leavers with useful practical skills that could help in leading more productive, independent and meaningful lives. Variations in modes of examinations and testing could lead to better results. Portfolios can be used as an authentic assessment tool in the classroom, or as a method to showcase one's professional accomplishments. In addition to aiding teachers in keeping track of a student's progress, the portfolio allows the student to chart his/her own academic growth. Higher education should be involved in determining what is competence, how it should be measured and by what standard it should be evaluated. Portfolios provide a means for professionals, students and education entities to demonstrate competence. Classroom techniques, tests and homework, portfolios, or collections of student work can be used formatively to support learning aims through improvement of teaching and learning.

Establishing reliability is a prerequisite for establishing validity. Although a valid assessment is by necessity reliable, the contrary is not true. A reliable assessment is not necessarily valid; an assessment is valid when appropriate for the purpose e.g. practical assessments should be used to assess practical skills. Written assessments

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requiring candidates to write about a skill instead of demonstrating it would have a low validity. Furthermore, a scoring rubric is likely to result in invalid interpretations, for example, when the scoring criteria are focused on an element of the response that is not related to the purpose of the assessment. *Carefully* designed analytic, holistic, task specific, and general scoring rubrics/criteria have the potential to produce valid and reliable results.

Significant factors in the examination systems for quality education

- A credible examination system is one that is recognised in the world of work and marks a certain level of attainment in the individuals who sit and write such examinations;
- The standardised examination system gives and provides reliable information that will be a pointer on the quality of education provided in a given education system;
- The quality examination system is a measure of quality education;
- An examination system that confirms the level of school-leaving performance of candidates can provide the level of skill at leaving school, and points at individual level of attainment; and, thereby suggest the level of understanding and type of skill one can provide in the world outside school;
- A meaningful examination determines the candidates' proficiency with certification and possibly the professional path that the candidate may follow.

With reference to the above-listed factors on examinations, it should be noted that: Examinations have the potential to provide reliable information on quality education

provided the confounding variables such as teacher quality; school management and supervision; instructional resources; quality assessment tasks and approaches are attended to.

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