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Tanzania science teachers' practices and challenges in continuous assessment

Kibuna Mrisho Mpapalika

A Research dissertation submitted to the School of Education, University of Witwatersrand-Johannesburg in partial fulfillment of the requirement for the degree of Master of Education (M Ed).

Supervisor: Prof. Elaosi Vhurumuku

December, 2013

DECLARATION

I declare that, apart from the assistance acknowledged, this research report, titled: "Tanzania science teachers' practices and challenges in continuous assessment" is my own work. All of the sources that I have used or quoted have been acknowledged by means of complete citation and referencing. This research report is being submitted to the University of the Witwatersrand in partial fulfillment of the requirements for the Masters of Education degree (MED). It has not been previously submitted for any other university.

……

KIBUNA MRISHO MPAPALIKA

Date ……

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DEDICATION

This dissertation is dedicated to my parents Mr. Andrew Mpapalika and my late mother, Fabiana Matambi; to my brothers: Alois, John, Ramadhani and Hamis Lea for their encouragement and support in my studies.

ABSTRACT

This study investigated the practices and challenges of Tanzanian Science teachers' in continuous assessment (CA). Fifty participants were involved were science teachers conveniently selected from three secondary schools in Kibaha District, Tanzania. The study was guided by two core research questions: (1) what is the nature of the practices of science teachers in continuous assessment? (2) What are the challenges faced by the teachers in continuous assessment? The Science teachers understanding of the nature of instructional classroom practices in continuous assessment was elicited through semi- structured interviews (n= 6) and classroom observations (n= 3). Furthermore, Science teachers' challenges were elicited through questionnaire (n= 50) and semi-structured interviews (n= 6). Data was analyzed using qualitative and quantitative methods. The study firstly revealed that most of the Science teachers' practices in Kibaha District are based on theory approach and follow the expository inquiry type classroom instruction rather than practical work. Secondly, it was found that there is a shortage of qualified science teachers and insufficient of teaching resources which impede the effectiveness of classroom teaching instructions. Thirdly, Science teachers possess an inadequate knowledge base on how to implement formative classroom assessments. On the basis of these findings, this study recommended that Tanzanian science teachers should possesses adequate knowledge of science curriculum and pedagogical content knowledge to improve the quality of education system. Continuous assessment as an assessment tools in evaluating learners' performance which enhances teaching and learning process. For effective classroom continuous assessment, science teachers' should involves scientific investigation, open inquiry instructions and problem solving. Additionally, there is a need for Tanzania Government to have long and short plans for the preparation for science teachers' professional development through in service training, coaching, networking and mentoring. Possible further study should investigate the challenges and practices faced by science teachers' in implementing practical work in secondary schools. Also there is necessitated for Tanzania to have a national wide evaluation of practice continuous assessment in the science classroom at all education levels to improve science education.

Keywords: Assessments, continuous assessment/formative assessment, assessment of learning, assessment for learning, summative assessment, teaching instructional practices, expository and inquiry investigative.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter focuses on the background to the study; the Tanzania school curriculum context the research questions and theoretical aspects of continuous assessment. The chapter explains the rationale for the study and describes how this research report is organized and presented. This study comprises of five chapters.

Chapter One describes the introduction of the study including background of the study, objectives, research questions and the scope of the study.

Chapter Two covers the literature review focusing on relevant literature on formative assessment and summative assessment. It covers the theory guiding this study. It also provides an overview of the research done on formative assessment practices, the rationale for formative assessment and teacher difficulties in the implementation of formative assessment.

Chapter Three describes methodology and the instruments used in this study. It also provides the information about the location of the study area (Kibaha district in Tanzania).

Chapter Four presents analyses and discusses results of the study from questionnaires, interviews and classroom observations.

Chapter Five gives a summary of the study and provides conclusions and recommendations.

1.1 Background of study

Effective practices in continuous assessments in teaching and learning process are vital components in developing students' meta-cognitive skills and valuable in giving feedback and crafting instructional strategies (Heritage, 2007). According to Anikweze (2005), continuous assessment is the process of investigating the status or ongoing student's performance. Njabili (1985) defines continuous assessment as process which involving the systematic collection of marks or grades by the teacher over a period of time and the consolidation of these marks or

grades to decide learners' final grades. Generally, in schools, marks and grades are collected from homework, practical assignments, quizzes, tests, and projects done by learners. According to Falayalo (1986) marks and grades can be collected based on cognitive, affective, and psychomotor learning tasks. Continuous assessment enables the teacher to modify his/her teaching strategies, monitor learner progress and make decisions about progress in curriculum implementation (Alausa, 2005). It also enables teachers to make predictions about learner performance in public examinations.

Whatever its focus and purpose, continuous assessment provides teachers with developing strategies' of learning outcomes and challenges. However, research work on the African continent (see, for example, Kano, 1985, Osaki, Hosea, and Ottevanger, 2004; Lissu, 2008) reveal that most science teachers have difficulties in implementing continuous assessment, especially in practical/laboratory work. These research studies have also shown that the majority of science teachers are unable to choose the most appropriate procedures and techniques in conducting and administering continuous assessment. Given this scenario, it would be interesting to investigate the challenges and practices of Tanzania science teachers in continuous assessment.

For this reason, this study attempts to investigate the practices and challenges in continuous assessment of secondary school Science teachers in the Kibaha district of Tanzania. The study will add to knowledge about the state of continuous assessment in science teaching in Tanzania. There are few studies focused on continuous assessment in Tanzania (Lissu, 2008). Moreover, non on continuous assessment has been done in the Kibaha district of Tanzania.

1.2 The Context of the Tanzanian Curriculum

In order to understand fully this topic, it is important to examine briefly the context of the Tanzania secondary school science curriculum.

In Tanzania, junior secondary education started in 1930s during British colonial rule. This was followed by the establishment of senior secondary education after the Second World War. The

current education system in Tanzania is provided both by the public and private sector. The general structure of education system is as follows:

- Pre-primary education level (two years) starting 5 to 6 years old age, and each child who has 5 years of age is entitled for enrollment for pre-primary education level;.
- Primary education level (seven years) constitutes standard one to seven for 7 to 13 years old age.
- Secondary ordinary education level comprises form one to four for 14 to 17 years old age;
- Secondary advanced education level comprises form five to six for 18 to 19 years old age;
- University education level comprises 3 or more years for age above 19.

The curriculum of secondary education system consists of optional and compulsory subjects. The compulsory / core subjects in ordinary secondary education comprises mathematics, English, physics, chemistry, Kiswahili, biology, history, geography and civics. The optional subjects consists home economic, information and computer studies, additional mathematics, music, fine arts, French, Arabic, Islamic studies, bible knowledge and physical education. For the optional subjects students may choose one or any one or two of the optional subject offered in schools. The language instruction employed in primary public schools is Kiswahili while in primary private schools is English language. Secondary education (public and private schools) employs English language as teaching classroom instructions.

In schools, formative and summative assessments are used to measure student performance (National Examination Council of Tanzania, NECTA, 1991). The use of formative assessment in Tanzanian schools can be traced to Nyerere (1967). In his book, *Education for Self Reliance*, Nyerere (1967:25) castigated the assessment methods used in schools and insensitive to the needs of Tanzania'. Through the Musoma Revolution in 1974, the colonial continuous assessment was made compulsory in all junior and senior secondary schools. According to Njabili (1987) the Musoma Revolution aimed to de-emphasize paper qualification based on examinations and place emphasis on developing students' abilities. It was directed by Nyerere (1967) that excessive emphasis on written final examinations is reduced and learner progress be assessed through continuous assessment (National Examination Council of Tanzania (NECTA),

1991). A continuous assessment package consisting of two assessment components was recommended. It was recommended that assessment be done as: academic component = 50%; and the final examination = 50%. The academic component, which is school based assessment, includes: class exercises, homework, class tests and assignments weighted at 20%; terminal examinations weighted at 25% and a project weighted at 5%. The project is a compulsory component of the assessment at each of the following secondary school levels; Form Three, Form Four and Form Six. By 1976, this system of assessment was well entrenched in the Tanzanian education system. The assessment system used in Tanzania can be summarized as shown in

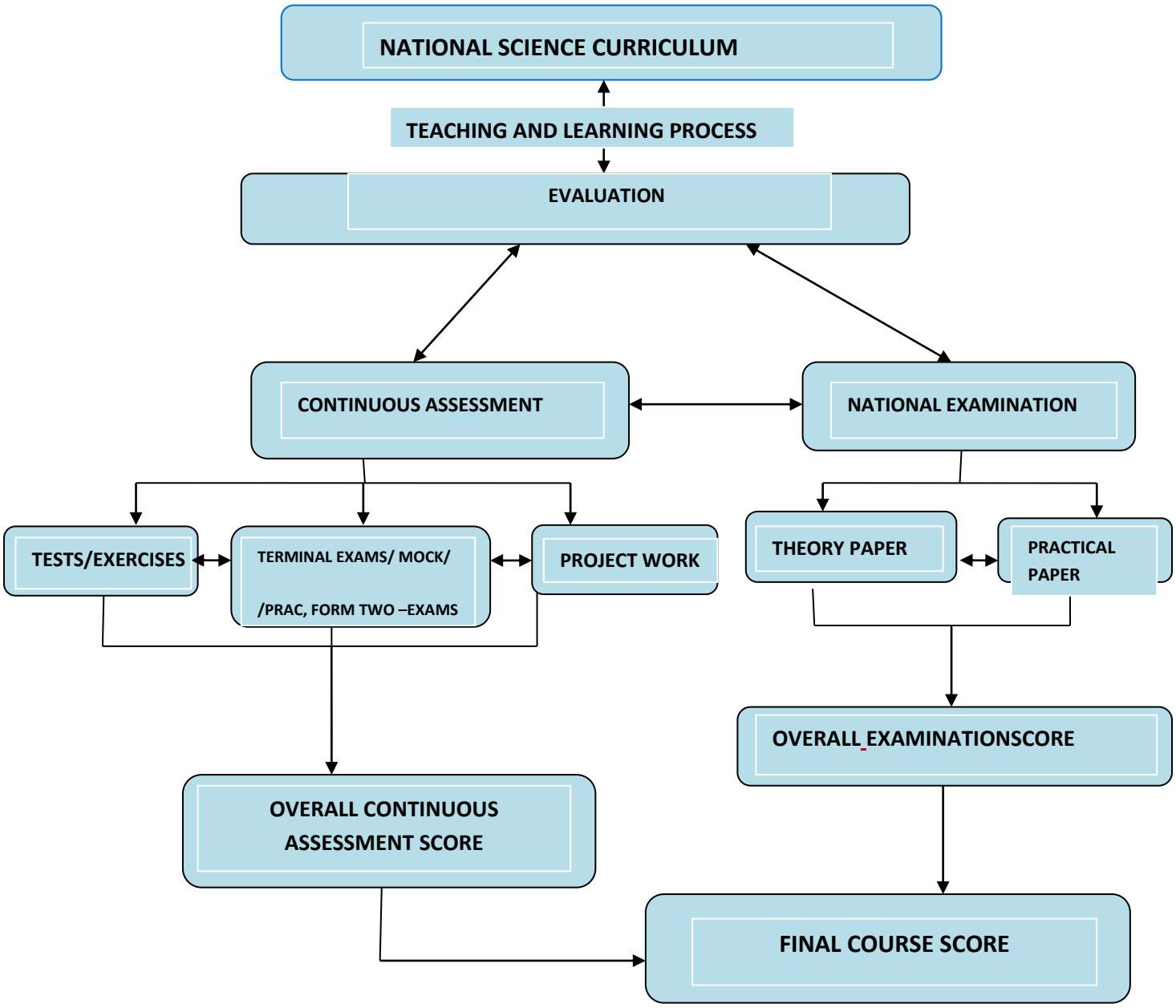


Figure 1Figure 1.1: A summary of the system of assessment in Tanzania from Lissu (2008)

For tests and examinations, the Tanzania National Examination Council recommends the use of both objective questions, for example, true false items, matching and multiple-choice items and subjective, open ended questions, e.g. essays, short and long type questions (National

Examination Council of Tanzania, 1991). In 1976, the National Examination Council of Tanzania introduced guidelines for use by teachers in continuous assessment at the secondary school level. These guidelines included instructions on how to construct questions and assess practical skills (Mtani, 1976). As Lissu (2008) noted it was envisaged that assessment of practical work would provide both teachers and students with the motive to do practical work as well as opportunities for development of science process skills. Science process skills include abilities to observe, formulate hypotheses, collect data, analyze data and think systematically and critically. Research done by Osaki, Hosea and Ottevanger. (2004) revealed that most Tanzanian Science teachers had experienced challenges on how to implement continuous assessment with regard to practical work. This was attributed to insufficient of teacher professional development at both in-service and pre-service teacher training levels.

Another research by Lissu (2008) showed that the majority of science teachers (Chemistry, Physics and Biology) experienced difficulty in procedures and methods employed typically in conducting and administering of continuous assessment. Additionally, Tanzanian Science teachers have been found to be inadequately skilled with regard to the administration and implementation of continuous assessment (Osaki, 1999). This implies that in Tanzania science teachers experience difficulties classroom instruction. Osaki (1999) notes that science teachers have inadequate instructional skills such as making observations, testing hypotheses, analyzing data, and writing reports. This scenario is exacerbated by the realities of poor classroom conditions, inadequate learning resources (e.g. textbooks, laboratory supplies) and use of inappropriate classroom teaching strategies by teachers Chonjo, Osaki, and Mrutu, (1996); Zalia, 2007 asserts that most teachers are unwilling to practice effective classroom instruction due to inadequate knowledge and adherence to traditional teaching styles, which are void of basic principles of scientific inquiry.

In the Kibaha district, a predominant problem in the schools of this district is the shortage of qualified science teachers in schools. This is exacerbated by the high teacher-learner ratio and very high teaching loads. For example, in most schools, Science teachers, are also required to teach other subjects including Mathematics, Agriculture and Geography. Table 1.1 below shows the number of Science teachers per school for the eight schools in the Kibaha district. Only two

of the schools offer secondary education up to Advanced level (A level). These schools are located in peri-urban areas. Six schools offer only secondary education up to Ordinary level.

Table 1.1 shows the distribution of secondary schools, students and science teachers) in Kibaha rural district science teachers (Source: Kibaha District Education Office, 2012)

School	**Location of school**	**Number of students**	**Number of science teachers**
Kilangalanga secondary (Advanced level)	peri-urban	1044	17
Ruvu secondary (Advanced level)	peri-urban	555	20
Dosa Aziz secondary (Ordinary level school)	Peri-urban	527	6
Mihande secondary (Ordinary level)	Peri-urban	500	3
Rafsanjani Soga secondary (Ordinary level)	Rural	493	6
Kwala secondary (Ordinary level)	Rural	353	8
Magindu secondary (Ordinary level)	Rural	473	4
Ruvu station (Ordinary level)	Rural	675	6
TOTAL		**4620**	**70**

The peri-urban schools boast of having better qualified teachers with university degrees. In the rural schools, most of the science teachers hold teaching diplomas. As table 1.1 shows the Kibaha district has only 70 science teachers. These teachers are expected to teach across all the three science disciplines of Biology, Chemistry and Physics. As can be discerned from Table 1.1 the teacher-learner ratio is extremely high which might influence education quality and students' performance. It is therefore, this study was basically to examine the science teachers' challenges and practices faced in conducting formative assessment in teaching and learning process.

Problem of statement

The fundamental aim of this study is to investigate science teachers' practice and challenges faced when administered classroom continuous assessment. This study was interested to examine what are the challenges and assessment practices hinder continuous assessment in secondary schools at Kibaha district during teaching and learning process. In addition, continuous assessment varies from one district to another. This undermines the appropriate and effective use of formative assessment which is important in improving students' performance. According to Lissu (2008), in Tanzania the assessment of practical work varies from school to school depending on the availability of laboratory equipment. The way that continuous assessment is practiced in Tanzania also varies from one educational zone/district to the next. A study by Zalia (2007) showed that continuous assessment was done in ways which can be described as highly subjective, especially with respect to the setting and moderation of tests and examinations. She recommended that, there is a need for the NATIONAL EXAMINATION COUNCIL OF TANZANIA (NECTA) to produce a uniform format for school-based continuous assessments so as to have one standard in all zones in Tanzania. It is within this context that this study investigates teachers' practices and challenges in continuous assessment in science subjects.

1.3 Research Questions

Specifically, the study sought to answer the following two questions: :

- What is the nature of teacher practices in continuous assessment?
- What challenges are faced by the teachers in practicing continuous assessment?

1.4 Theoretical framework

This study is guided by the theory on assessment approaches that is: formative assessment/continuous assessment and summative assessment. These classroom assessment instructions linked with constructivism through scientific inquiry based. According to the American *National Science Education Standards* (NSES) (National Research Council, 1996, p. 23) scientific inquiry as:

> 'the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Inquiry also refers to the activities of students in which they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world' [National Research Council, 1996, p. 23].

Scientific inquiry consists of skills and abilities that are necessary in conducting classroom continuous assessments. Such abilities include identifying scientific problems, designing and conducting investigations to solve the problems, collecting and analyzing data, interpretation of results and communicating the findings (Hofstein and Lunetta, 2004; Kang and Wallace, 2005) . Classroom instructional practices, for example laboratory works such as practical assessments are related with exposition, discovery, guided discovery, problem-solving, and investigative, inquiry and constructivist approach (Domin, 1999). The efficiency of these teaching instructional and assessments strategies based on their openness to inquiry or student-centeredness (Haury, 1993; Ravitz, Becker and Wong, 2000). Abd-El-Khalick et al. (2004) asserts that inquiry, constructivism and investigation of the nature of science are interconnected. The scientific inquiries based are essential for evaluating classroom continuous assessments practices.

1.4.1 Continuous Assessment

Continuous assessment is about obtaining marks from tests, exercises, terminal examination, practical laboratory and project work (Njabili, 1985). It is carried out throughout the course of study. On the other hand, *summative assessment* involves obtaining marks based on a final examination or obtaining marks at the end of a course. As an assessor, the teacher is expected to evaluate his or her learners' performance through continuous assessment (Osaki, 1999). Normally, learners' final scores are comprised of both the continuous assessment and summative assessment. For effective assessment, the teacher must be skilled and competent in constructing and administering continuous assessment. This is important for improving the effectiveness of the teaching and learning process. It is important that teachers be able to follow assessment procedures when constructing and administering continuous assessment in the classroom (Lissu, 2008).

The Education Commission (2000) defines assessment as collecting evidence of the learner's learning. It is an integral part of the learning and teaching cycle rather than a separate stage at the

end of teaching. It helps to provide information for both learners and teachers to improve learning and teaching. Continuous assessment could be internal (school assessments such as tests, homework and projects) or external (example of assessment is mock examinations supervised under the TANZANIA HEAD OF SCHOOLS ASSOCIATION (TAHOSA). The aim of internal assessment is to provide information to students and parents about the performance of students. External assessment provides information to education department and ministry officials about what is happening in schools. Continuous assessment also called formative assessment has been described as the type of assessment whereby the learners are evaluated throughout the year of their course of study (Amedahe, 2000; Etsay, 1992). It enables teachers to get quick information about the student's progress which helps to evaluate their teaching strategies (Etsay, 1992). Adeyegbe (1993) defines the term formative assessment as an ongoing process which measures the students' achievement during the course of study at specified duration. Webb and Brairs (1990) see continuous assessment as an interaction between teachers and learners. This implies, teachers continually find out what learners can do and how. On the other hand, learners are able to perform a given task through instructions from the teacher and are aware of teacher expectations. In this way, formative assessment provides feedback to both the teacher and the learners. It focuses on continuing evaluation of learners' progress throughout the course of study.

Lewis (1997) observes that many countries have adopted continuous assessment strategies in order to improve the quality of teaching. In Nepal, Carnoy (1999) notes that continuous assessment is used as an indicator of school quality and for learner promotion purposes. Etienne (2007) observes that in Mauritius, some teachers practice continuous assessment at the beginning of the first term for purely organizational reasons. However, on the African continent, practices of continuous assessment vary from country to another. In Liberia, for example, continuous assessment is weighted 65% and the final examination 35 % (Wisseh, 2009). In Nigeria, continuous assessment started in 1977. It was aimed at assessing overall progress of learner performance and teacher use of different strategies. The continuous assessment weight is 60% and the final examination weight is 40% (Pennycuick, 1990). In Swaziland, continuous assessment was implemented in 1996 with the aim of evaluating whether learners understand the content taught in the classroom (Fakudze, Simelane and Dlamini, 1979). Amedahe (2000)

reports that, in Ghana continuous assessment was introduced into secondary schools after the New Education Reforms Package of the late 1980s. In Ghana, continuous assessment is criterion referenced and focuses on whether learners understand concepts (Etsey, 1992).

1.4.2 Summative Assessment

Summative assessment is the systematic way of evaluating learners at the end of the course (Estey, 1992). Tamakloe (2005) views summative assessment as that which is done at the end of the course for the evaluation learners' performance. It examines the extent to which the main goal of teaching and learning has been achieved after a given period of time. Therefore, this study investigates Tanzania science teachers' practices and challenges faced practices in conducting continuous assessment in Kibaha district at Tanzania.

1.5 Scope of the Study

The study confined to one district (Kibaha district) in the coastal region of Tanzania. The study aimed at finding out how the Tanzanian science teachers practice formative assessment strategies during science classroom instruction in secondary schools. It further explored the challenges faced by the teachers in implementing and administering the formative assessment in the classroom.

CHAPTER TWO: THEORETICAL BACKROUND

2.0 Introduction

This chapter presents a review on the theory on assessment. The concepts formative assessment and summative assessment are explored. The chapter also reviews some of the research done on formative assessment. The presentation is organized under the following headings: definition of terms used in assessment theory; assessment theory; an historical overview of research on formative assessment practices; research on teachers' practices and challenges in implementing continuous assessment; and conclusion.

2.1 Definition of Terms

Different definitions of formative assessment have been suggested by different scholars. Before discussing the different terms, it is important to explain the difference between the concepts of *assessment for learning* and *assessment of learning*. According to Black et al. (2003) *assessment for learning* is any assessment aims at promoting and developing student performance in all aspects of the teaching and learning process. It involves frequent assessment tests. On the other hand, *assessment of learning* is done deliberately for grading and certification and involves non frequent assessment tests. Several researchers refer to assessment of learning as summative assessment and assessment for learning as formative assessment (e.g. Black & William, 1998; Gipps & Stobart, 1997; Stiggins, 2002). It is relevant at this point to examine the terms; assessment, authentic assessment, formative assessment, and summative assessment.

2.1.1 Assessment

Airasian (2001) defined assessment as the process of gathering, synthesizing, and interpreting *information* to assist in decision making. Apple & Krmsieg (1995) and Angelo (1995) distinguish between assessment and evaluation; assessment as a process-oriented, (formative) aimed to examine or diagnostic ongoing individual student's performance. Whereas evaluation is a product oriented, (summative) purposely used for judgmental issues such as validity, accuracy, reliability, analysis and reporting about students' performance. It also based on prescribe

comparative achievements among students to improve academic performance. Through this information, a teacher is able to evaluate his or her teaching strategies as well as learner's performance in the classroom. According to Webb and Briars (1990) assessment should be an interactive activity between the teacher and learners, during which the teacher searches for an understanding of what and how their learners can improve academic performance. According to Sadler (1989), assessment specifically aims to generate feedback for both learners and teachers so as to improve learners' performance as well as the teaching and learning process. Yoloye (1999) has argued that assessment might be used to predict future learners' progress in their summative assessment (final examination) and their potential success in particular job opportunities. This is said to be the case whether the assessment is of the traditional type based assessment of learning or the modern constructivist type based assessment for learning (Zalia, 2007).

2.1.2 Authentic assessment

Constructivists assert that effective teaching and learning is linked with *authentic assessment,* learner centered learning and the teacher being a guide in a collaborative learning process (Brooks & Brooks, 1993 cited in Chapman, & Mahlok, 2004). *Authentic formative assessment* requires learners to perform meaningful activities in the teaching and learning process. In Tanzania, in a study of the practice of assessment by teachers in Advanced Level Physics, Zalia (2008) found that most of the formative assessments done were teacher-made tests dominated by theoretical perspective. This is contrary to authentic assessment or formative assessment which requires more emphasis on learners' performance based on actual classroom learning. Zalia (2008) also found little support was given to the science teachers in terms of materials, and little advice was given to teachers on how to implement authentic assessment in the teaching and learning process.

2.1.3 Formative assessment

Black and William (1998) clarify the notion of *formative assessment* as a process which enhances teaching and learning. They argue that formative assessment offers learners information that allows them to develop and improve academic achievements. In this regard, an assessed module, graded assignments, terminal examinations may serve as forms of formative assessment if learners receive high-quality feedback on how to improve their performance. These are not necessarily summative assessments. At the same time, a mid-semester, ungraded assignment may not be a formative assessment if all that the feedback says is "good work, or well done" (Black & William, 1998). Assessments may become formative only when the feedback is used to improve the future teaching and learning. According to Sadler (1989) assessment can be being formative only if it is used to close the gap between "actual and expected" learner performance. Heritage and Niemi (2006) define formative assessment as a logical process of frequently collecting evidence based on what is being learned and not covered during the course of instruction. Teachers might collect this information through questioning, classroom observations, dialogue, demonstrations and written response in classroom (Heritage & Niemi, 2006; Black & William, 1998). Therefore, formative assessment provides the feedback needed for the teacher and learners to develop and improve teaching and learning respectively.

2.1.4 Summative assessment

Summative assessment unlike formative assessment focuses on summing up students achievements, or classes, or schools (National Research Council, 2001, Sadler, 1989, Shavelon, 2006). Summative assessment is based on what learners have learnt by the end of specified period (Doing, 2006; Black & William 1996). Ogunniyi (1991) argues that such kind of assessment is ineffective in measuring learners' achievements as well as in the teaching and learning process. Furthermore, summative assessment is essentially concerned with cognitive skills and pays little attention to the psychomotor and affective domains. Such an assessment done at the end of term or year encourages learners to rote learn and memorize facts so as to answer examination questions.

2.2 A Historical Overview of Research on Formative Assessment Practices

Research related to formative assessment practices in the classroom can be traced back to the work of Scriven (1967). He introduced the concept of formative assessment practices in his work based on evaluation of educational programmes which include curricula, teaching methods, and instructional materials. Scriven distinguished between formative assessment and summative assessment. He described *formative assessment* as a process in which a program has been produced and recognized to be practiced and *summative assessment* as the final gathering of information in evaluations of learning goals. Since then the concept of formative assessment has been debated among scholars worldwide and much research has been done on the conceptions of formative assessment practices in relation to instructional activities.

Bloom, Hastings and Madaus (1971) were the first to relate the use of formative and summative assessment concepts in instructional strategies for the purposes in improving mastery of learning. Generally, the goal of learning was to make sure that learners move from one to the next level of understanding until they demonstrated the mastery of specific learning goals. Bloom, Hastings, and Madaus (1971) argued that formative assessment was evaluative and aimed at developing and improving students' learning and achievement. They recommended that assessment should not only be used in summative evaluations of learners' performance but also be incorporated in formative evaluations of teaching and learning progress. They found that formative assessment in learning process could be improved when teachers provided feedback to learners and used corrective instructions for learning. For example, when teachers know their learners' misconceptions from formative assessment, they could use this information to adjust their instructional practices (Boston, 2002).

Following the World Declaration on Education for All (EFA) in Jomtien in (1990), many countries made significant changes to their theories on assessment practices. The EFA acknowledged four major components of assessment, which are; public examination, national assessment, international assessment, and classroom assessment practices. Studies by the Human Science Research Council (2008) between 1995-99 and between 2000-2006 looked at the practices in assessments (formative and summative) worldwide. These studies showed that at least 33% of Sub-Saharan African Countries including Tanzania carried national assessments.

National assessments were also done by 55% of the Arab States, 33% of Central Asian states, 64% of East Asian and Pacific states, and 77% North America and Western Europe states.

A study conducted in New Zealand by Crooks (1988) investigated the effects of formative assessment practices on learners' achievement. The study revealed that practices of classroom formative assessment had powerful potential in improving teaching and learning and promoting learner motivation. This is supported by Sadler (1989) who asserts that formative assessment enhances learners' abilities to evaluate the quality of their learning through specific teaching instructions provided by teacher. In another study, Black and William (1998) analyzed 250 research studies on formative assessment. They concluded that formative assessment is effective key to improving teaching and learning and learners' thinking capabilities as well as academic achievement. They added that formative assessment provided valuable feedback that can be used to adjust teaching and learning tasks in the classroom. This is echoed by the (NRC) National Research Council (1996) and the National Council of Teachers of Mathematics (2000) who both emphasizes that teachers should practice formative assessment in the classroom.

In the United States of America, the Formative Assessment for Students and Teachers (FAST) (2008) and Student Standards (SCASS) (2008) reviewed classroom formative assessment practices. Both FAST and SCASS recognized formative assessment as a process used by teachers and students during instruction to provide feedback so as to adjust ongoing teaching and learning. They looked at formative assessment as a process rather than a terminal activity. Thus, formative assessment practices encompass teaching strategies are implemented during classroom instruction so as to improve teaching and learning.

FAST and SCASS added that for effective formative assessment teachers should integrate instruction and learning goals in order to receive valuable feedback. They recognized five key components which make effective practices of formative assessment in the teaching and learning process. The first component is *learning progression* during which the teacher should interpret and integrate the formative strategies with learners' progress to improve learning difficult areas (Heritage, 20007). Second, are the *learning goals and success criteria* during which teachers must provide learning standards resulting from the feedback elicited from learners. Third, is *descriptive valuable feedback* which improves the teaching and learning process. The fourth

component is the learner's active engagement in self- assessment and peer-assessment as part of the learning experience. This enables learners to think metacognitively and deepen their understanding of their own learning capabilities. The fifth component is that effective formative assessment practices should *involve collaborative activities* during classroom instruction.

FAST and SCASS emphasize that both teachers and learners must share responsibilities in teaching and learning through class dialogue, discussions, interpretations and solving problems. According to Heritage (2007) successful formative assessment requires the teacher crafts clear instructional strategies, have observations skills, give valuable feedback, and question learners effectively. They describe formative assessment as a cyclic process involving four dimensions. First, teachers should ask: "Where am I going?" considering their learners' progression and their own teaching instructions. Second, teachers ask: "How can I close the gap?" of learners understanding through scaffolding by re-teaching and providing immediate valuable feedback to raise achievement. Third, teachers must know: "What classroom culture is required" in order to elicit evidence of learning progressions and identify learners' understandings. Fourth, teachers should implement formative assessment practices such as peer assessment, self-assessment, group discussions, observations and questioning strategies to raise learners understanding. Similarly, the Third International Conference on Assessment for Learning (TICAFL) (2009) represented by such countries as the United States, United Kingdom, New Zealand, Australia and Canada viewed formative assessment (for learning) as every day practices by both teachers and learners involving dialogue, group discussions, demonstrations and observations to reflect ongoing teaching and learning.

In the United Kingdom, the Assessment Reform Group (ARG) (2002) also recognized formative assessment as a potential component in teaching and learning. The ARG point out that the formative assessment in classroom should be planned effectively in the development of teaching and learning process: based on how learners learn in classroom; regarded as a key in expert skills for teachers; acknowledged as central to classroom assessment practices; **c**onsider learners motivation towards learning process; promote learning goals through assessed criteria used in evaluations; enable learners to get positive instructions on how to progress; develop and build the learners' thinking capacity for self-assessment skills in solving problems.

As the whole, continuous assessment and formative assessment are associated with classroom assessment such as diagnostics tests aiming to improve students' achievements through feedback process. Classroom assessments enable to motivate students in teaching and learning process. Also help teachers to adjust their teaching strategies to identified students learning outcomes (Boston, 2002).

In comparison with the formative assessment; continuous assessment also enables to"…provide authentic and meaningful feedback for improving student learning, instructional practice and educational options" (Njabili, Abedi, Magesse, & Kalole, 2005: .2). Amedahe (2000) and Etsey (1992) highlight six characteristics of continuous assessment as follows: cumulative means that the "final grade awarded a student at the end of the term or year is an aggregation of score or accumulation of all the attainments throughout the term or year" (Amedahe, 2000, Etsey, 1992); diagnostic because it involves monitoring of a student's academic performance. This assessment enables teachers to identify the student's strengths and weakness in teaching and learning process; formative assessment simply because it "allows immediate and constant feedback to the student's on his / her academic achievements" (Tamakloe et al. 2005); comprehensive assessment which include the "number of evaluation instruments and procedures employed, These consist of teacher made tests, classroom observation, classroom assignments, oral questions , standardized tests, interviews, rating scales and sociometric techniques"; guidance – oriented which help the teachers to understand student's strengths and weakness in academic achievements and this enhance guidance process; systematic assessment means "well scheduled during the week, term and year of programme" (Etsey, 1992); from the above discussions not all continuous assessments are related to formative assessment.

Continuous assessments can be formative assessment when teachers provide immediate valuable and constant feedback to learners (OECD, 2005). Therefore, continuous assessments are not regarded as formative assessment, if it cannot be used formatively in classroom instructions. It is obvious that effective classroom continuous assessments practices enable the science teacher to monitor learners' progress and evaluate his/her instructional strategies. In this study, it is therefore interested to evaluate the science teachers' practices and challenges of continuous assessment in the science classroom in Kibaha district.

2.3 Assessment Theory

As earlier noted, this study is guided by theory on assessment which involves both formative and summative assessment. Broadly assessment involves all activities that teachers and learners perform during the teaching and learning process (Black and William, 1998). In this regard, teachers should undertake activities such as classroom discussions, observations, analysis of students work including tests and homework. Fisher and Frey (2007) distinguish between formative assessment and summative assessment. Formative assessment enables teachers to improve their teaching instruction and also provides feedback to learners while summative is aimed at measuring learners' competency at the end of the course. Formative assessment helps both the teacher and learners in self-assessment and identifies the learning gaps. In other words, formative assessment relates directly to classroom instruction.

Heritage (2007) has suggested a formative assessment model based on learning progression, closing the learning gaps and defining the criteria for success. This involves: learning progression and defining criteria for success, eliciting evidence of learning; interpreting the evidence and identifying the gaps. It also involves providing feedback to learners, planning learning and teaching and scaffolding learners. In this process, teachers should continually practice formative assessment in the classroom to identify learners' misconceptions in order to empower self-regulation (Sadler, 1989). The assessment model aims to identify the "gap" between what exactly learners know in relation to their desired goals. This is in line with Sadler (1989) who views formative assessment as aimed at providing feedback on learners' progress and developing teaching and learning in the classroom.

This model is grounded in Vygotsky's assessment theory based on the Zone of Proximal Development (ZPD) (1978). In order to identify the learning gaps, the model emphasizes that teachers should know how to recognize and use learners' pre-existing knowledge so as to develop new understanding. Teachers need to identify what learners may achieve in the Zone of Proximal Development (Shavelon, 2006, Torrance & Pryor, 1998). In the ZPD, Vygotsky hypothesized that learning and development occur through a scaffolding process. The ZPD is defined as the distance between the learners' actual development as determined by problem

solving and the higher level of potential development under the guidance of a more knowledgeable person (Vygotsky, 1978). Formative assessment enables teachers to gather information about learners' understandings to close the gap between learners' current learning and the desired future goals through scaffolding (Shavelon, 2006). Teachers assess learners' performance through ZPD and provide such tasks as practical work, group discussions tests and projects. Assessment is specifically intended to generate feedback to learners to develop critical thinking, improve learning achievements and facilitate self- assessment (Sadler, 1989).

2.3.1 Feedback as regulatory self-assessment

Feedback is a regulatory type of formative assessment which helps learners to reflect on the quality of teaching and learning process and academic performance (Nunn, 2011). Several researchers have emphasized the use of feedback information in helping teachers to guide learners move towards desired learning goals (Black & William, 1998, Watson, 2006). Feedback also enables learners to assess the existing gap between current knowledge and desired learning goals (Sadler, 1989). Feedback information is important in implementing formative assessment through self-regulation for both teachers and learners. Black and William (1998) encourage teachers to apply different strategies in assessing learners, for example, questioning, self-assessment and classroom discussion. These strategies provide opportunities to develop learners' new knowledge through their prior misconceptions and also improve teaching and learning. In order to practice effective formative assessment teachers must ask meaningful and reflective questions in relation to specific lessons taught and provide learners enough time to respond. Thus, the main purpose of formative assessment is to provide the learners with maximum opportunities to learn and to demonstrate from time to time the knowledge, the skills and attitudes that they have acquired during the teaching and learning process (Zalia, 2008).

2.3.2 The teacher as formative assessor

Formative assessment recognizes the teacher as being professionally skilled and having the attributes of integrity and knowledge to judge learners' capabilities (Isaac, 1995). The teacher is also accountable to the learners in ensuring that through assessment he/she knows whether

learning is attainable through feedback information (Sadler, 1989). In order for the teacher to practise the formative assessment function effectively, he/she must be skilled enough to assess accurately learners' performance as well as improve teaching and learning through applying various assessment strategies. According to Black and William (1998), for assessment to be effective the feedback information must be used to assess learners' progress and guide future teaching and learning. As a formative assessor, the teacher should assess learners continually and determine whether learners have acquired knowledge based on the subject taught. Through feedback, the teacher should make a self-evaluation of his/her teaching instruction. In this case, teachers need more training in assessment skills for effective implementation of formative assessment. Vygotsky (1978) emphasized that the more knowledgeable teachers are, the more they are able to assist learners in solving tasks such as an assignments, quizzes, or projects. Therefore, it is important for teachers to have more knowledge in the implementation of formative assessment practices.

Schulman (1986) asserts that pedagogical content knowledge for teachers is important in order to employ effective teaching and learning strategies. It also helps teachers to be competent and accurate in conducting formative assessment in the classroom. Thus, understanding the concept of "Formative Continuous Assessment" makes implementation of pedagogical content knowledge easier. This is possible through studying the purpose for which the feedback information will be used in assessing learning achievements. Both formal and informal methods may be used in assessment of learners' progress. Both teachers and learners have to be accountable to engage effective classroom continuous assessment for successful learning outcomes. The learner is also accountable to the teacher in order to achieve his/her desired learning goals. Teachers should implement and practice formative assessment meaningfully based on logical reasoning.

2.3.3 Advantages of formative assessment

The Human Science Research Council (HSRC, 2008) emphasizes the importance of formative assessment in enhancing the quality of education. Adebowale and Alao (2008) add that formative assessment encourages recurrent interactions between learners and teachers and among learners.

It also enables teachers to know the strengths and weakness of learners and identify learning gaps for purposes of remediation. The Department of Education (2008) highlighted that continuous assessment should be practiced in classrooms as follows: firstly, develop learners' understanding, skills and values; secondly, evaluate the weaknesses and strengths of learners. thirdly, offer more support to learners in the learning process. Last but not least, revise curriculum content and lastly, encourage learners in the teaching and learning process so as to improve learning outcomes (DOE, 2008). Greaney and Kellaghan (1996) see formative assessment as enhancing the development of learners' self-thinking, peer collaboration and abilities to solve problems. It gives more opportunities for learners to learn authentic activities and gain new knowledge through their prior ideas.

2.4 Research on science teachers' practices in implementing continuous assessment

A study by Israel (2005) in South Africa also found that teachers experienced difficulties in implementation of formative assessment. These difficulties were associated with high workloads and insufficient of professional development. Similarly, Kibga (2004) investigated the role of practical assessment in teaching and learning of Physics in O-level secondary schools in Tanzania and found that the majority of Science teachers experienced difficulties in conducting formative assessment. Once again, the obstacles cited were: a lack of knowledge, inadequate teaching and learning resources; high workload and large class sizes. This supports Zalia (2007) who found that most of the teachers in Tanzania have inadequate skills and knowledge in formative assessment.

In other studies done in Tanzania, it was found that in most of the community aided schools, learners were not adequately assessed in practical work due to inadequate of laboratory equipment (Chonjo, Osaki, & Mrutu, 1996, Mshashu, 1997). This conclusion is in line with Osaki (et al., 2004) who found that the majority of teachers experience difficulty on how to practice formative assessment with regard to practical work. This has been attributed to lack of proper teacher preparation and professional development programmes at both in-service and pre-service teacher training levels**.**

Quansah (2005: 2-4) also identified two problems related to classroom continuous assessment:

- 'High stress in test taking and test making' implies that students have large number of assessment tasks as well as teachers work lord in marking and recording marks especially in large number of students;
- Insufficient of remedial instructions based on classroom continuous assessment such as tests, homework, practical tests.

2.5: Challenges of continuous assessment in Tanzania

Generally, the Kibaha science teachers have experienced difficulty in practicing and administering the continuous assessment. Firstly, the classroom language instructions used hinder the process of teaching and learning. The majority of students in Tanzania are bi or multi lingual and eventually they attend secondary schools in a language that is not their first or second language. Tanzania formal education is bilingual policy which entails students to learn both Kiswahili and English (MOEC, 1995). The policy stipulates English is used in secondary school while in primary schools medium instruction is Kiswahili (MOEC, 1995). As results students possess inadequate understanding the language especially in science concepts. Mastering of language becomes a barrier in understanding the science contents. For example, sometimes the science teachers use 'Swahili' language to elaborate scientific terms.

Secondly, low quality of science secondary education in Tanzania. Several studies done in Tanzania to investigate the situation of science curriculum content indicated the present of poor quality of science education (Chonjo et al 1996, Osaki, 1996, Mafuniko, 2006, Septimi, kitta, 2004). These studies revealed science syllabi have too academic contents and overloaded with many diverse topics which are probably difficult to be covered in respective allocated period. Also resource teaching materials are unavailable especially textbooks and laboratory equipments for science practical (Kitta, 2004). Mafuniko, 2006 reports that 'in some schools especially the community government secondary schools there is no laboratory facility". Kibga (2004) supports that in most science classes' teachers use chalk and talk method by writing notes on the chalkboard and students copy notes in their exercise books. Osaki (1999) also observed science students rely mainly on teachers' notes.

Thirdly, present large class size is another problem faced in science teaching and learning process. As evidenced by Kitta (, 2004) current science classes ranges from 50 to 70 for O'level and 35 to 60 for A 'level secondary education in Tanzania. In addition, the present schools laboratories were build to accommodate a class of 35 students for O'level and 45 for A' level students. This situation leads into ineffective in practicing the continuous assessment.

Fourthly, inadequate of qualified teachers in secondary schools especially for science and mathematics (Kibga, 2004, Zalia, 2007, Lissu, 2008). They added that current there was expansion of secondary schools in Tanzania to increase the number of students per class which in turn not match with the supply of qualified science teachers in governments and private secondary schools. This result ineffective in conducting the classroom assessment practices. Chonjo (1996) and Osaki (1996); Zalia, 2007; Lissu, (2008) also found that the majority of Tanzanian science teachers use traditional modes of instructional (teacher centered pedagogical approach) in teaching and learning process. Traditional mode instructional may not identify students' misconceptions and effectiveness of classroom continuous assessments.

Lastly, inadequate classroom assessment tasks administered during the teaching and learning process. Previous studies showed that little homework is given in schools (Osaki, 1999, Chonjo 1996 and Osaki 1996; Zalia, 2007; Lissu, 2008). Given that homework provides the opportunity for both teachers and students to evaluate academic achievement as well as valuable feedback, failure to provide more homework led into less feedback given to students.

2.5 Conclusion

The chapter presented a review of some relevant literature particularly on classroom continuous assessment. Continuous assessment/ formative assessment serve as regulatory self assessment both for teachers and students through feedback process. This study also explored some of the difficulties encountered by Tanzanian science teachers in implementing and practicing formative assessment. In the light of teachers' practices in continuous assessment, my own observation is

that good practices of teaching strategies may influence the quality of classroom assessments. The next chapter discusses the methodological framework which involves both qualitative and quantitative paradigms were used to quantify and analyze data. Three research instruments; questionnaire, semi structured interviews and classroom observation were employed for data collection.

CHAPTER TREE: METHODOLOGY

1. Introduction

This chapter presents the research methodology used in the study. First, the design and methodological framework are outlined. Next, the sampling procedures and participants are described. This is followed by a description of the instruments and data collection and analysis procedures. Issues of validity and reliability are also discussed.

3.1 Research design and methodological framework

A research design is defined as a plan of a research specifying what is to be done and how to do it. It involves the structuring and organizing all procedures of data collection, analysis and reporting in qualitative and quantitative research (Creswell, 2002). To answer the research questions: the nature of science teachers' practices and challenges faced in conducting classroom assessments, this study employed a descriptive survey research design utilizing two mixed methods qualitative and quantitative techniques. A quantitative approach usually uses research instruments, such as questionnaires, to collect, interpret and analyses data statistically. It is also involves the frequency of an event or number of respondents to a particular phenomenon (Best and Kahn, 1999; Mc Millan and Schumacher, 2006). Golafshani (2003) describes in quantitative approach, the researchers normally use charts and graphs to present their results. Hatch (2002) defined qualitative approach as "any kind of research that produces findings that is not arrived at by means of statistical procedures or other means of quantification". Also he highlights some characteristics of qualitative approaches as follows:

- "Human behaviors' are explored within the contexts of their natural settings;
- Perspectives of participants are highly respected;
- Researchers act as data gathering instruments;
- Researchers rely much on subjective judgments".

Fundamentally, in the qualitative methods, the interviews and classroom observation techniques were used to collect data. With effective continuous assessment science teachers' should understand how to use assessment formative techniques to improve learners' achievements. The research design viewed to be important because it describes the current situation in classroom formative assessment, teachers' challenges and practices in conducting continuous assessment in Kibaha secondary schools. For this study, data was collected using a questionnaire, semi-structured interviews and classroom observations (see Appendixes A, B and C). Data analysis and presentation involved descriptive quantitative aspects mainly frequency counts and graphical presentations. Some of the interview and observational data is also interpreted qualitatively and presented (Cohen, Manion & Morrison, 2000), following procedures of analytic induction and sequential analysis as described by (Murcia and Schibecci 1999). Figure 3.1 below summarizes the methodological framework of this study. The methodology describes the nature of Kibaha science teachers' practices and challenges when administered continuous assessment. These practices and challenges could be negative or positive. If science teachers; practices teaching strategies well planned and less challenges enhance the quality of continuous assessment. Whereas, the quality of continuous assessment can be organized poorly when they practice imperfectly teaching instructions and challenges. Teachers' practices include teaching instructions, practical work, projects, and tests, homework oral and self assessment. The challenges are insufficient of teaching materials such as text books, computers, chalks, maps, equipments and chemicals for laboratory work. Both science teachers; practices and challenges can influence the quality of continuous assessment. Therefore, this study investigates the nature of science teachers' practices and challenges when conducting the classroom continuous assessment.

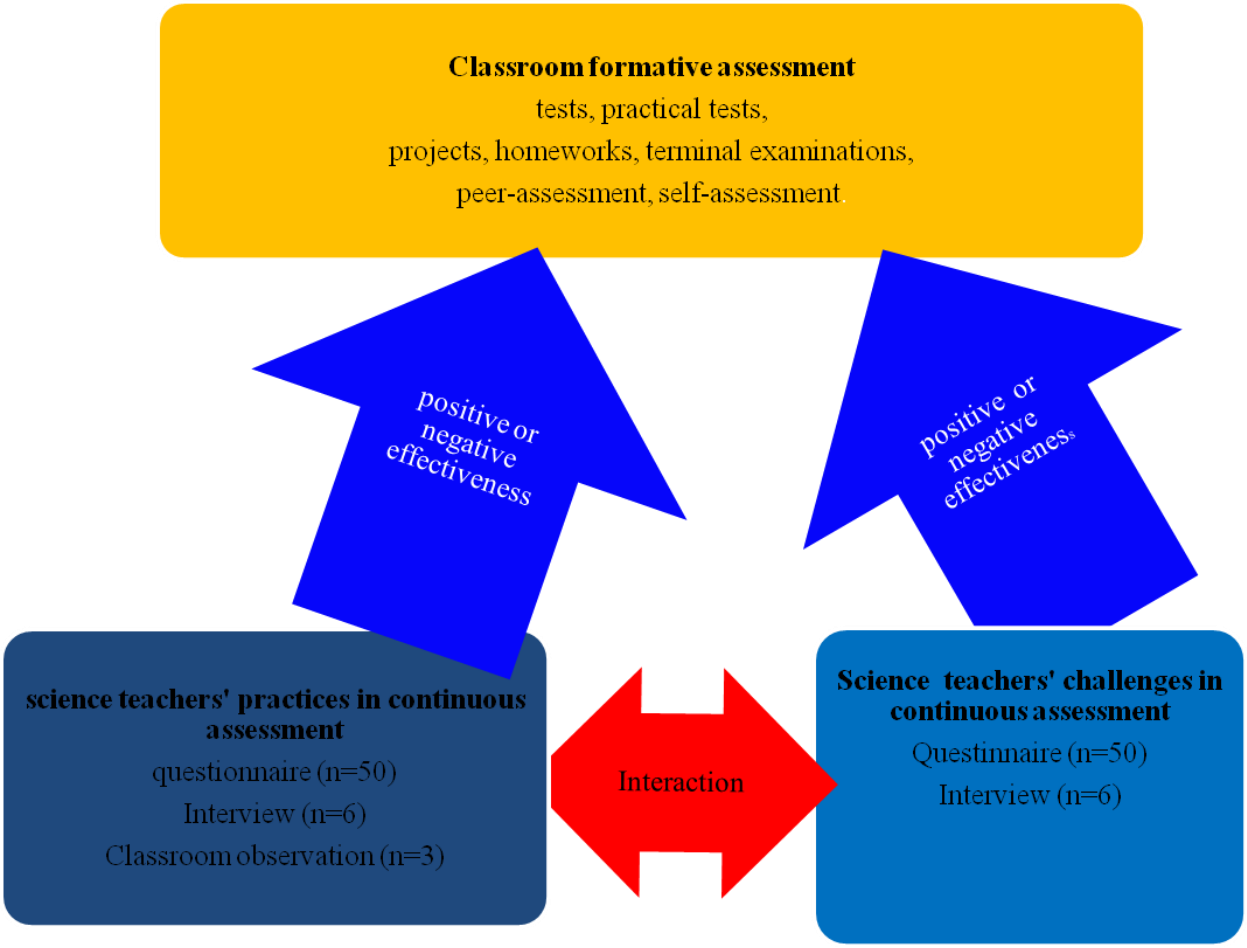


Figure 3.1 Summary of the methodological framework

3.2 Sampling and participants

Kibaha district is one of the 6 districts within the Pwani region of Tanzania. Others districts are; Kisarawe, Mkuranga, Rufiji, Bagamoyo and Mafia. The district located 38.90 to 39.05 longitude East and 6 to 8 latitude south. It covers an area of 1 630 square kilometers. The study was concentrated only in one district which is Kibaha rural district. The district has a total of eight governments' secondary schools (See, table 1.1). Three of the eight schools were chosen conveniently for teacher interviews, questionnaire and classroom observations. For this study, purposive sampling techniques were used to select three schools and 50 teacher participants. The choice was based on the schools proximity to where the researcher was stationed. Additionally, with limited time constraints and financial resources available were considered. This study used the survey research design to determine science teachers' practices and challenges when

administered classroom assessments. Fifty teachers from the three schools in the Kibaha district completed a questionnaire soliciting their views on practices and challenges faced in continuous assessment. The researcher made discussions with science teachers on how to answers the questionnaire, confidentiality and its important in teaching and learning process The science teachers responded to answers the questionnaire based on their willingness . The questionnaire was completed by 17 Physical Science teachers, 17 Chemistry science teachers and 16 Biology teachers. Table 1.1shows the distributions of science teachers in Kibaha district. At each of the 3 schools selected, two teachers were interviewed. The sources of both questionnaire and interviews questions were primarily structured to find out about classroom formative assessment approaches utilized by science teachers. Then, one teacher and one classroom at each of the three schools were conveniently used in classroom observation according to school timetable and availability of teacher. Table 3.1 shows the qualification levels and gender of the 50 teachers who completed questionnaire.

Table 3.1 Qualification levels and Gender of Science Teachers in Kibaha province (n =50)

Qualification	**Gender frequency and (percentage)**	
	Male	**Female**
Masters level	2 (4%)	2(4%)
Degree level	20 (40 %)	23 (46%)
Diploma level	1 (2%)	2(4%)
Totals	23 (46%)	27 (54 %)

The Table 3.1 indicates that 27 out of the 50 of science teachers (54%) were female and 23 (46%) were male. The table also shows that the majority of science teachers are degree holders. Table 3.2 shows the six interviewed teacher's gender, working experience, level of education qualifications and teaching subject.

Table 3.2 Background information on Science teachers that participated (n =6)

School	**A**		**B**		**C**	
gender	Female	Male	Female	Male	Female	Male
Designated Number	T1 and T2	0	T3	T4	T5	T6
Education level	Bachelor Degree	-	Bachelor Degree	Bachelor Degree	Masters Degree	Diploma
Teaching experience	T1=6 years T2=3 years	-	T3=7 years	T4=5 years	T5=4 years	T6=over 10 years
Teaching subject major	T1and T2 both teach Biology	-	Chemistry	Physics	Chemistry	Physics

Classroom observations were carried out at three of the schools. One school was private and the other two government secondary schools. The aim of having a private and government schools was to find out how teachers under different environments practice continuous assessment. The Science teachers observed were T1, T3 and T4 (See, Table 3.2). Teacher T1 is a woman with 6 years teaching experience. She held a Bachelor of Physical Science Education from the University of Dar res Salaam, Tanzania. She has specialized in Biology and Physical Science Education. She taught at both O and A level. Her school is a government secondary school for girls only. Teacher T3 is female and held a Bachelor of Science with Education degree from the University of Dar re Salaam. She had specialized in Chemistry and Mathematics. She has 7 years teaching experience. Teacher T3 has taught in government, community secondary school for both girls and boys students. Teacher T4 has 9 years' experience of teaching at this school. He holds a Bachelor of Science with Education degree from the University of Dar res Salaam. He had specialized in Biology and Geography. In Tanzania, diploma level teachers are allowed to teach only up to Ordinary level and teachers with a degree are permitted to teach at both Ordinary and Advanced levels (Ministry of Education, 1995).

3.3: Research instruments

This study examines the Kibaha science teachers' practices and challenges in conducting the classroom continuous assessment. The questionnaire and semi-structured individual interview were used to collect data .Also non-participatory laboratory observations were observed to investigate how science teachers practices teaching instructional style when conducting the classroom continuous assessment. In this section presents the instruments employed in this research. These are the Science Teachers' Practices and Challenges in Continuous Assessment (STPCCA) Questionnaire (Appendix A), the Science Teachers Practices and Challenges faced in Continuous Assessment (STPCFCA) Interview Guide (Appendix B), and the Classroom Observation Schedule (COS) (Appendix C).

3.3.1 Questionnaires

The questionnaire method was used in this study to collect data because of the following reasons:

- It serves economic purpose in relation to both time factor and money (McMillan & Schumacher, 2006);
- They added that questionnaires instruments administered to a larger sample of participants compared to other research instruments;
- It also allows sufficient time for the participants to scrutinize about their responses.

3.3.1:1: Science Teachers' Practices and Challenges in Continuous Assessment (STPCCA) Questionnaire

The Science Teachers Practices and Challenges in Continuous Assessment (STPCCA) Questionnaire consisted of three sections. Section A asked teachers about what they thought generally about continuous assessment. It has 10 items. They were asked to indicate either agreement or disagreement with a statement on a two-point Likert scale either, 'Agree' (A) or 'Disagree' (DA) by ticking **(√)** in the appropriate space (see Appendix A).

Section B has 10 items and required the Science teachers to indicate how they practiced formative continuous assessment in the classroom. They were asked to indicate either agreement or disagreement with a statement on a two-point Likert scale either, 'Agree' (SA) or 'Disagree' (SDA) by ticking **(√)** in the appropriate space (Appendix A). Below are some examples of items in Section B of the questionnaire:

1: I give my learners tests weekly;

4: I give my learners a practical test every week;

16: I do remedial work when learners have performed poorly in a test or home work.

Section C of the questionnaire had 6 items. Science teachers were asked to indicate the kinds of challenges they faced when conducting continuous assessment in classroom. They were required to respond to Likert type items on scale either 'Agree' (SA) or 'Disagree' (SDA) by ticking **(√)** in the appropriate space (Appendix A). Examples of questions asked in Section C of the questionnaire are the following:

1. The instructions on how to conduct continuous assessment are clear and understandable;
2. Continuous assessment helps teachers improve their teaching;

17 Continuous assessment increases the workload for teachers.

The *construct and face validity* of the questionnaire were determined through extensive and intensive consultations with the supervisor. *Construct validity* is about the extent to which the items in the questionnaire actually contribute to measuring what they are supposed to measure (Cohen et al., 2000). In this case, it is about whether the questionnaire actually captures information about teacher practices and challenges in continuous assessment. *Face validity* is about whether on the face of it, the instrument actually measures what it purports to measure (Dudu & Vhurumuku, 2012). The construct and face validity questionnaire were used to explore the science teachers' practices and challenges in conducting the continuous assessment.

3.3.2 Interviews

In this study, six science teachers were interviewed in their respective science classroom laboratories in three selected school. The laboratories seemed to be more conducive environment

than other places which would allow for appropriate interviewing process. The interviews were intended to investigate the science teachers' practices and challenges when administered the classroom continuous assessment. Cannell and Kahn (1968: 527) cited by Cohen et al. (2000) describe an interview instrument as "a two-person conversation initiated by the interviewer for the purpose of obtaining research-relevant information, and focused by him on the content specified by research objectives…". The interview questions were semi-structured format with an interview guide (Appendix B) arranged in sequentially to reduce bias (Cohen et al. 2000). The interviews were audio-taped to control and monitor the responses during the interviews process. Prompting and questioning techniques were used to explore in depth responses from the interviewees (Cohen et al. 2000). The prompting and questioning were used during the interview to explore the science teachers' practices and challenges in classroom continuous assessment. Then the interviewed data were transcribed for interpretation and analysis.

3.3.2:1 The Science Teachers' Practices and Challenges Faced in Continuous Assessment (STPCFCA) interviews guide

The Science Teachers' Practices and Challenges faced in Continuous Assessment (STPCFCA) semi-structured interview guide consisted four sections (A,B, C, D) (see, Appendix B). In section A, Science teachers were asked to provide demographic information based on gender, level of education qualification, teaching experience and the type of subject they teach. It was interesting to investigate if the science teachers' practices and challenges when administering and conducting the continuous assessment were associated with any of these variables.

Section B required science teachers to explain their views and understanding of continuous assessment in teaching and learning. Examples of questions asked were the following:

1: What is continuous assessment?

4: What do you think disadvantages of continuous assessment?

7: What do you think about the quality of exams in Tanzania?

Section C elicited science teachers' practices in conducting continuous assessment. This section required the teachers to describe how they implemented continuous assessment. Examples of questions asked were the following:

9. How often do you assess your students? Daily, weekly, monthly?
12. What factors do you consider when setting assessment tasks?
17. After you have given work, how long does it take for you to give feedback to the students?

In section D, the Science teachers were required to describe the challenges they faced when practicing continuous assessment. Examples of questions the participants were asked the following:

23: What problems or challenges have you encountered in conducting continuous assessment?
26: Do you think Tanzanian teachers need training in continuous assessment? Explain your answer.
30: Do you think the instructions given to teachers on how to conduct continuous assessment are clear?

All interview data were audio taped, transcribed verbatim and checked by researcher afterwards for accuracy.

3.3.3: Classroom Observation Schedule (COS)

A semi-structured Classroom Observation Schedule (Appendix C) was devised and used. The classroom observation focused on events that happened during the lesson. The non-participatory classroom observation (Cohen et al., 2000) was used to triangulate the data obtained from the Science Teachers Practices and Challenges in Continuous Assessment (STPCCA) questionnaire and Science Teachers' Practices and Challenges Faced in Continuous Assessment (STPCFCA) interviews. Wallace and Kang (2004) describe that non-participatory observation enables the researcher to explore phenomenon such as instructional practice. Each of the three selected Science teachers was observed in their class for two lessons. In each case, the researcher sat at

the back of the classroom and took notes of what was happening. The focus of the observation was on aspects of formative assessment. Through the classroom observation schedule, the researcher recorded what the teacher did during instruction.

One weakness of using classroom observation is that the observer being in the classroom (same location) with the observed might change the normal behavior of the observed (Gall et al., 2007). To minimize this effect, the researcher made an arrangement with the class teacher so that the researcher was introduced to the learners one day before the classroom observation. This process was thought to help learners develop confidence and concentrate on their respective tasks and to reduce observer effects. The researcher also explained the purpose of conducting the research to the class teacher in order to reduce observer effects.

Generally, the observation was guided by a deliberate effort to capture the following:

1. Did the teacher give feedback?
2. How was feedback given?
3. How frequently were continuous assessment tasks given?
4. What was the role of questioning in the teaching and learning process?
5. What was the frequency of questioning and answering?
6. Were class exercises given? And what was their purpose?
7. Did learners have autonomy to ask questions?
8. Was there evidence of self-assessment?
9. Intended teaching and learning goal achieved;
10. Presentation of introduction and conclusion of the lesson;
11. Management and organizations of classroom;
12. Tasks and activities to elicit evidence of learning;
13. Availability and distribution of teaching resources;
14. Interaction between teacher and learners and also among learners;
15. Teaching strategies;
16. Questioning strategies to elicit students thinking;
17. Types of assessments given learners;

18. Teaching approach used for example, verification, solving problems, discovery, and investigative, guided inquiry, expository, non-expository.

3.4 Data collection procedure

Data collection was done after obtaining clearance from Wits School of Education Ethics Committee, Protocol Number 2012ECE192 (see, Appendix G) and permission from the Kibaha District Education Office. The data was collected in the following sequence: questionnaire administration (n=50); semi-structured interview (n=6); and lesson observations (n=3).

The researcher went to each of the three schools to distribute the questionnaire to the selected teachers. The teachers were gathered in one classroom and the questionnaire was given to each teacher. The researcher then explained the purpose of the questionnaire and allowed the respondents to ask questions regarding items in the questionnaire. Respondents were then allowed to take the questionnaires away for completion and told that the completed questionnaires would be collected on the following day. Each of the 50 teachers successfully completed and returned the questionnaires.

Interviews were conducted by the researcher with each teacher at the three selected schools. At each school, the interview was conducted in the school laboratory. During the interviews, probing was used, where necessary, to capture essential information (Cohen, et al., 2000). As noted earlier, all of the interviews were audio taped and transcribed verbatim.

Each of the three observed teachers was observed for two consecutive lessons taught on two successive days. Immediately after the classroom observation, the observation notes were written up in an effort to maintain accurate data collection. The notes were later typed as a MS Word document.

3.5 Data analysis

Data from the interviews, questionnaires and classroom observations were analyzed and summarized and then presented through tables and graphs. For the Science Teachers' Practices and Challenges in Continuous Assessment (STPCCA) Questionnaire, in computing frequencies,

the categories ‘strongly agree’ (SA) and ‘Agree’ (A) were collapsed into one category of ‘Agree’. Similarly the categories ‘Strongly disagree’ (SDA) and ‘Disagree’ (DA) were collapsed into one category of ‘Disagree’. The frequencies are converted into percentages and the data is presented in the form of graphs. The data was analyzed according to the research questions and is presented section by section. Section A asked teachers about what they thought generally about continuous assessment. Section B has 10 items and required the Science teachers to indicate how they practiced formative continuous assessment in the classroom. Section C of the questionnaire had 6 items. Science teachers were asked to indicate the challenges they faced when conducting the continuous assessment in classroom.

Data from the Science Teachers’ Practices and Challenges Faced in Continuous Assessment (STPCFCA) interviews were analyzed using a combination of analytic induction and sequential analysis as described by Murcia and Schibecci (1999). Essentially, each teacher’s interview transcript was read and re-read several times. Important themes and ideas coming out of the data were noted. Supportive interview excerpts in support of the identified themes or ideas were chosen for presentation. First, the researcher and a fellow Masters student independently read through the transcripts and then came together to discuss their identification of themes and choice of excerpts. The themes that were finally agreed upon were arrived at through consensus. The major criteria were the answer to the question; what are the major issues coming out from the interview.

As was the case with the STPCFCA, data from classroom observations were also analyzed using a combination of analytic induction and sequential analysis. Essentially, each teacher’s lesson observation notes were read and re-read several times. Important themes and ideas coming out of the data were noted. Supportive events and statements coming out of the lessons were identified and chosen for presentation. Again, the researcher and a fellow Masters student independently read through the lesson observation notes and then discussed their choice of themes, events and statements. The agreed upon themes were arrived at through consensus. The major criteria were to answer the question; what are the major issues coming out from the observed lessons. This study link with McMillan and Schumacher (2006), recommend that validity is about the extent to which inferences made on the basis of the collected data in appropriate method.

3.6 Ethical considerations

Permission to carry out the study was applied for and granted by the Tanzania Ministry of Education Kibaha District Office. Ethical clearance was also applied for and granted by the Wits School of Education Ethics Committee, Protocol Number 2012ECE192 (see, Appendix G).

Participation in the study was completely voluntary and participants were asked for consent to participate in all aspects of the study, i.e. answering questionnaires, being interviewed and being audio taped. They were assured that all information collected from the study would be treated in strict confidence.

3.7 Conclusion

In this study, qualitative and quantitative techniques, and descriptive research design have been used for data collection methods. Purposive sampling techniques have been employed to select three secondary schools in Kibaha district. Fifty (50) Kibaha science teachers have been selected conveniently to participate in this study. Data has been collected using three research instruments; namely, STPCCA Questionnaire, STPCFCA Interview Guide and Classroom Observation Schedule (COS). The steps followed in collecting data, presenting and analyzing data were detailed. Issues regarding ethics and validity were discussed. In the next chapter the findings of the study are presented in tables, figures and discussed.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.0 Introduction

In this chapter, the results are presented, analyzed, and discussed. The results are presented in the same order as the two research questions posed in this study. The research questions are the following:

- What is the nature of teacher practices in continuous assessment?
- What challenges are faced by the teachers in practicing continuous assessment?

4.1 The nature of teachers' practices in continuous assessment

4.1.1 Science Teachers' Practices and Challenges in Continuous Assessment questionnaire

The questionnaire covered aspects on the following: how frequently these teachers carried out continuous assessment; feedback and remediation; and use of assessment to improve teaching. In the next section, the results from questionnaires on these aspects are presented.

Frequency of continuous assessments

The first six questions on the questionnaire asked teachers about how frequently they assessed learners through tests, homework, and practical work. Figure 4.1 shows a summary of teacher responses to questions regarding how frequently they did continuous assessments.

Figure 4.1 shows that majority of Science teachers in Kibaha district said that they frequently gave learners tests weekly and homework every day. According to these teachers, they said that they normally give tests and homework to improve teaching and learning. This is in line with the recommendations of the National Examination Council of Tanzania (NECTA) (1991) which highlights that teachers should collect frequently continuous assessment marks from various exercises (homework, class tests, and quizzes), to chart and improve learners' progress. The NECTA adds that learners can be assessed individually or in groups through different assessment

tools. This is supported by Black and William (1998) who assert that continuous assessment has a powerful impact on improving teaching and learners' achievements.

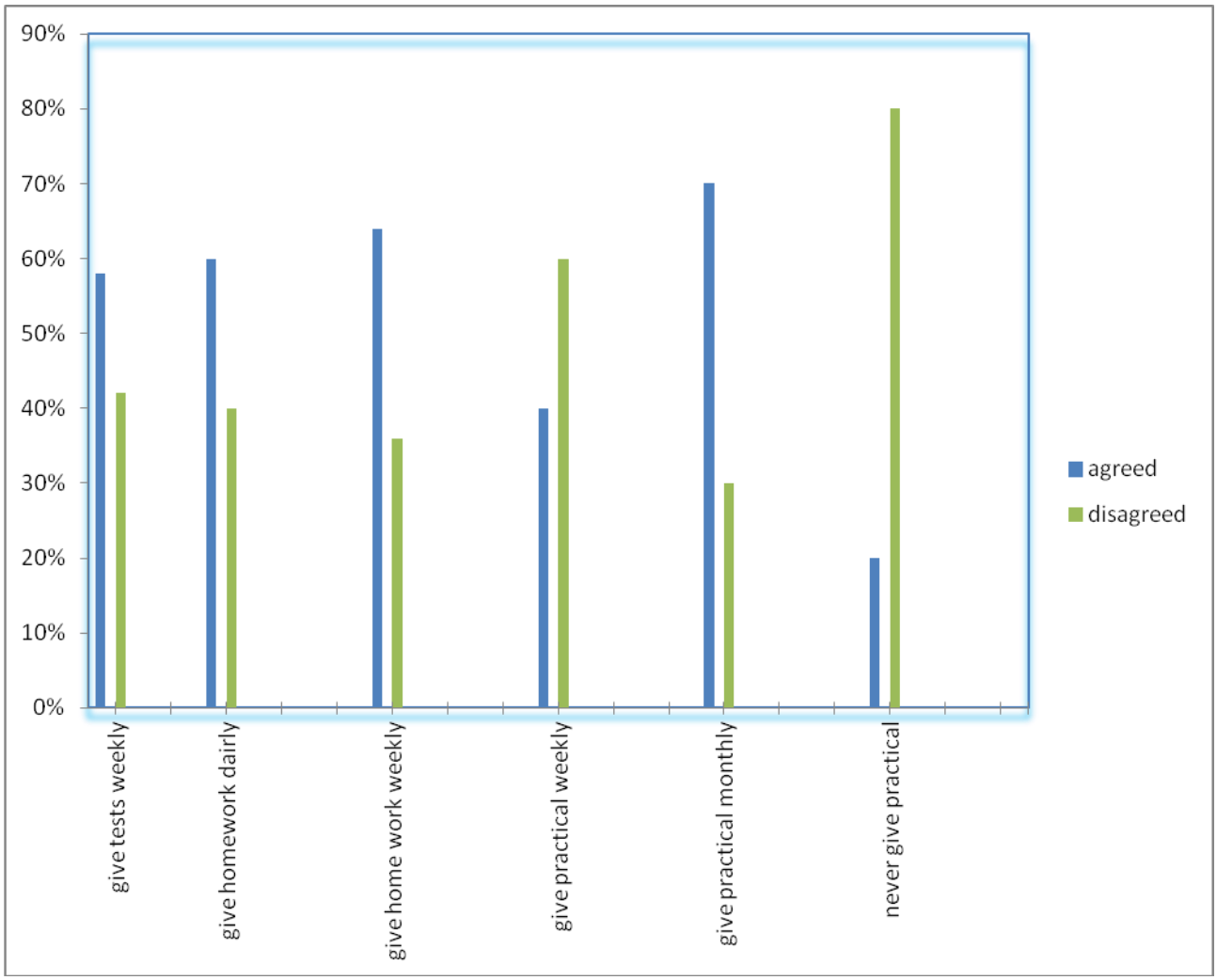


Figure 4.1 Frequency of continuous assessment tasks by science teachers (n = 50)

On the frequency with which they assess practical tests in the classroom, 60 % of the Science teachers indicated that they did not give practical tests weekly. However, a large number (70%) of the Science teachers said they gave practical tests twice per monthly. They added that this was due to the inadequate of resources such as chemicals and apparatus for weekly practical assessment. These findings are consistent with Ware (1992) who found that in most countries, practical assessments are not regularly done because of inadequate laboratory facilities and much

more focus is placed on theory examinations. Kibaha district has 8 government secondary schools. Only 3 of the 8 schools have well-equipped laboratories and they manage to do practical assessment weekly. This could be the reason why the majority of the Kibaha Science teachers do not assess practical frequently and give theory tests as an alternative to practical tests. According to Lissu (2008), the decision taken by Tanzania in 1992 to introduce an alternative to practical at Ordinary level science for those schools with no laboratories, contributes to this scenario. The alternative to practical implies as an alternative mode of assessment to the practical examination paper. It is done theoretically by assessing the practical skills. Other studies have also shown that most of the schools in Tanzania provide theoretical sessions rather than actual practical work (Zalia, 2007; Kibga, 2004; Osaki, 1999). However, it is encouraging to note that the majority of science teachers agree that they give practical test twice per month and not on weekly basis.

Feedback and remediation

Five questions in the questionnaire asked teachers to indicate how frequently they provided feedback and remediation to learners. Figure 4.2 shows a summary of teacher responses to the questions relating to how frequently they give feedback and remediation to learners.

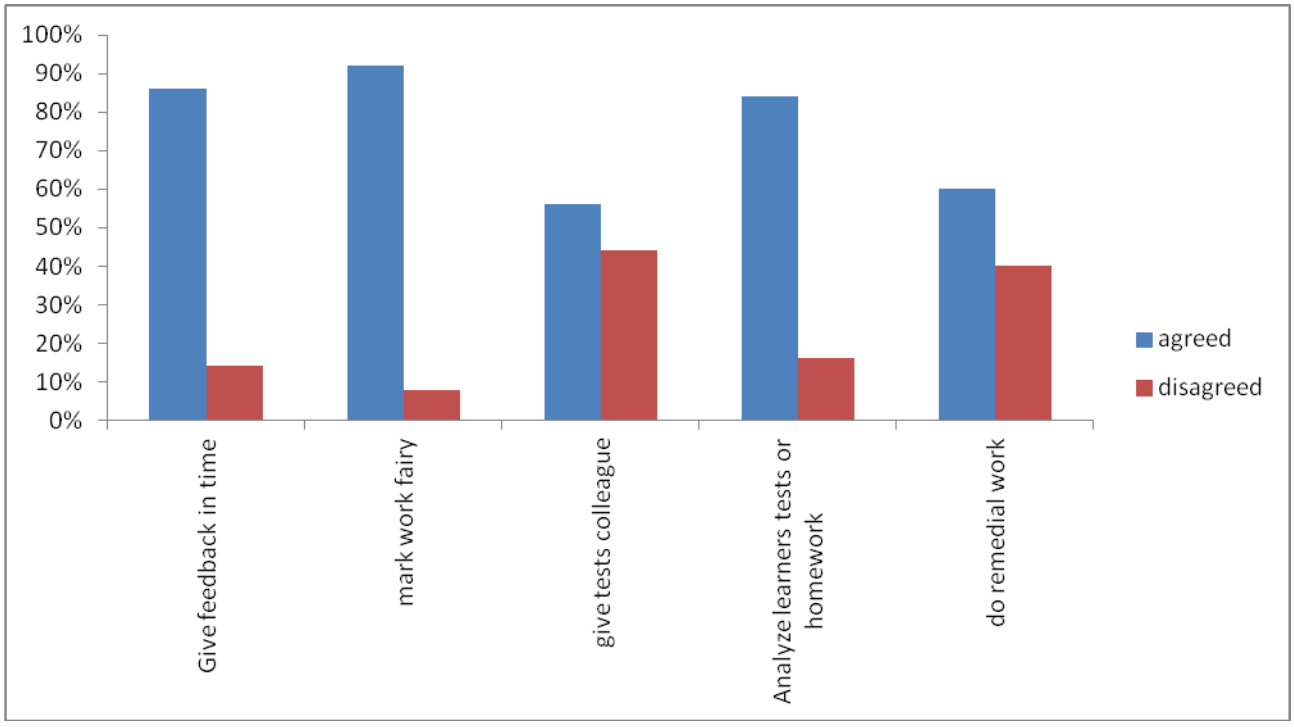


Figure 4.2 Frequencies' on feedback and remediation by science teachers (n=50)

As Figure 4.2 shows, the majority (86%) of the Science teachers were in agreement that they give learners feedback in time. Only 14% of science teachers disagreed with the statement. It appears that Kibaha Science teachers understand the importance of classroom formative feedback to learners. This supports Black and William (1998) where they noted that formative feedback enhances learner's progress. Formative feedback, correction and remedial teaching enable learners to improve their achievement outcomes (Zalia, 2007; Njabili, 1999).

With regards to how frequently the Science teachers mark learner's work, the majority (92%) indicated their agreement with the statement. This finding supports the study by Lissu (2008) who views fair continuous assessment marks as enhancing learners' future performance as well as teaching and learning. The majority of Science teachers (58%) said they always give a colleague their tests to moderate. Lewis (1997) has recommended that it is important for a teacher to be engaged in discussions with colleagues based on learner's performance.

Concerning the remedial work, the majority of the Science teachers (60%) indicated that they did remedial work when learners performed poorly in a test or homework. This implies that in Kibaha district science teachers actually do remedial work when learners fail in their tests and homework. This is supported by Etsey (1992) and Amedahe (2000) who assert that in continuous assessment, teachers should provide essential feedback and remedial work to learners as part of the practice of continuous assessment. The majority (84%) of these Science teachers also indicated that they analyzed learners' performance.

Use of assessment to improve teaching

The science teachers were requested to indicate how frequently they use assessments tools to improve their teaching through, tests, learners' answers and re-teaching a topic when learners fail a tests. Figure 4.3 shows the results on the use of assessment to improve teaching.

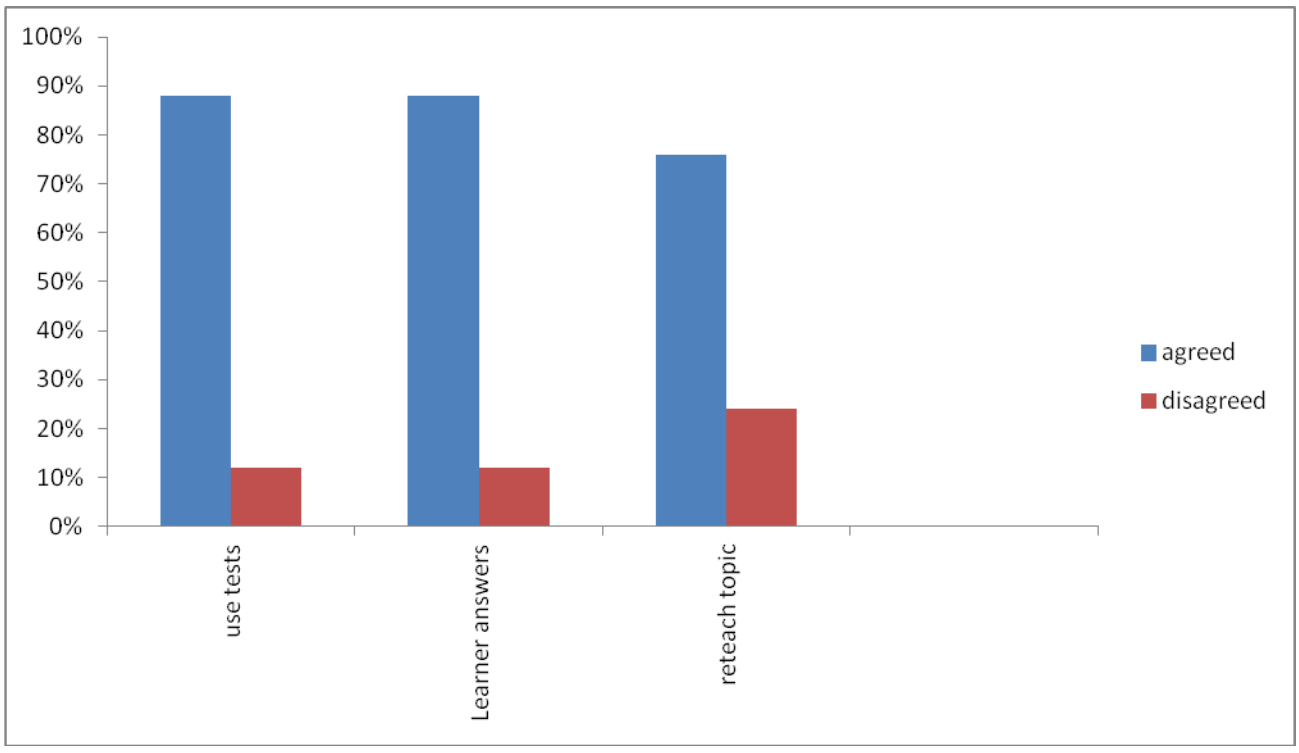


Figure 4.3 Frequencies on the use of assessment to improve teaching by science teachers (n=50)

From Figure 4.3, most of the science teachers (88%) said they use tests results to revise learner's poorly done work. This might mean that science teachers actually use tests results to revise work poorly done by learners and adjust their teaching instructions. Concerning the use of learners' answers in tests and homework to improve their teaching instruction in classrooms, the majority of the science teachers (88%) agreed that they use learners' answers in tests and homework to improve teaching. Figure 4.3 also shows that the majority of science teachers (76%) said they always re-teach topics when learners fail to understand. This is consistent with Stiggins (2002) who notes that continuous assessments is significant in informing teachers in evaluation of what they taught as well as what they need to re-teach.

4.1.2 Results from interviews

Results from the interviews are presented here. Science teachers were required to explain how frequently they practice continuous assessment in the classroom. A question was posed to these Science teachers that required them to describe their views on their practices and implementation of continuous assessment.

For the question: "how often do you assess your learners, daily, weekly, monthly, or once per term?' one teacher said he assessed learners tests weekly. Three of the teachers said they assessed learners' tests monthly; while two teachers said they assessed learners for every lesson taught and weekly. These findings imply that the majority of science teachers actually do assess learners frequently through continuous assessment, but point to weekly assessments and not daily assessments. This corroborates with the findings from the questionnaire where the majority of science teachers declared that they assess learners weekly or monthly and not daily.

Concerning the types of tests, the science teachers were required to describe the types of assessment tasks they gave to their learners in the classroom. The teachers said most of the assessment tasks given to learners were achievement tests like homework, weekly tests, group work and projects. One science teacher said;

> "I assess tests, homework actually after two weeks." (T 1)

Another teacher added:

> "I always give students home works, weekly tests, midterm tests, terminal exams and annual exams." (T 2)

It appears that the majority of science teachers actually give exercises frequently, including tests, home works, and midterm and terminal exams. However, the findings show that these Science teachers assess practical work twice per month depending the availability of chemicals in the laboratories. Generally, for all of the six interviewed teachers, none of them said that they use oral assessment, peer and self-assessment during their classroom instruction. It also came out that most of the Kibaha science teachers usually use tests that they have constructed themselves (teacher-made tests). This findings linked with Zalia (2007) found most science teachers constructs made-tests for classroom assessments. Similarly, Black and William (1998) say teachers should develop their own tests to collect the appropriate evidence of learning performance. They argue that good questions are hard to generate students' new critical arguments and teachers need to collaborate and draw critically from outside sources through effective training of mentors, coaching and inter school networks.

The Science teachers were asked to describe factors they considered when setting tasks in the classroom. The teachers said they considered topic coverage, school time-table, learners' capacity, and cognitive domain. Two of the teachers noted:

> "I consider cognitive domain, content coverage, and time management and learners capability." (T 1).

> "I consider content coverage of the topics, length of the tests, aim of the tests and time taken." (T 4).

In terms of the assessing cognitive abilities, all the teachers said they evaluated the cognitive abilities of their learners when administering classroom assessment. They also said when they prepare tests they always used a marking scheme or assessment rubrics. One teacher explained:

> "I always prepared marking scheme when I construct a test." (T 5).

Additionally, four of the teachers said they always asked other colleagues to moderate their tests. One teacher said:

"Yes, we work as team in our department." (T 6)

This is consistent with teacher answers to question 11 of the questionnaire, where the majority of the teachers indicated they always give their colleagues their tests for moderation. Two teachers said they never asked other colleagues to moderate their tests.

Further, the teachers were requested to explain the way they mark learners work, tests, and practical assignments. Each of the six teachers declared that they prepared marking schemes and always marked fairly. This is shown in the following interview extracts:

"I should prepare marking scheme first, provide marks on each question according to its weight and if a test contains, let say five questions, I will mark question number one to all followed by second to the last and I mark all in fairness." (T 2)

"I prepare a marking scheme with marks rewarded to each question and I start to mark question wise, I mean, one question to all students and then another question to all students until the end of questions." (T 6)

In education, feedback is an important part of the teaching and learning process. According to Volante (2011) interactive feedback through marking is a central component of formative assessment and enhances learning outcomes. The Science teachers were asked to indicate how long they took to give feedback to the learners. Three of the teachers said they gave feedback to their learners after one week. Two said it depended on the number of learners but not more than two weeks. While one expressed:

"Not more than a two weeks, but sometimes there are interferences from the school time table." (T5)

Researcher: "What do mean interference from school timetable?"

> "I mean, class teaching sessions may be interfered with extra curriculum activities like sports, debates." (T5)

From these responses, it appears that the majority of Kibaha science teachers give feedback after one week depending on the number of learners and the school timetable. This is inconsistent with the results from the questionnaire where the majority of the science teachers declared that they provide feedback to learners frequently. This implies that the science teachers provide feedback after one week as evidenced from other previous studies (Osaki, 1999; Kibga, 2004; Zalia, 2007 and Lissu 2008).

Another question asked was: "what do you do when giving feedback to learners in tests, homework and practical" Four of the six Science teachers said they always identified areas of difficulty after marking the learners' scripts and then they make corrections on paper or in class. Two of the teachers said they did remedial classes. One Science teacher said:

> "I conduct remedial class on the part because if the majority fails, it means that the subject was not clear to students… later on, I find what caused the failure of the tests and alternative way of solving such problems." (T 1)

The Science teachers were also asked: "how do you handle and organize assessment marks?" Their answer was that they always kept the assignments marks in a portfolio. Four teachers said they kept marks in handwritten form and used a calculator to compute marks. On the whole, the results show that science teachers use different methods for keeping and handling learners' assessments marks. This study discovered that in the Kibaha district, the majority of Science teachers lacked essential computer-based skills. This was evident when the teachers were requested to describe the use a computer to handle learners' marks. Four teachers said that they never use a computer while two said they a use computer for students' marks. Several studies in Tanzania have shown that most of schools lack computer facilities for teaching and learning (e.g. Zalia, 2007; Kitta, 2004; Mafuniko, 2006; Kibga, 2004).

Apart from nature of how the science teachers practice continuous assessment, the Science teachers were also asked to describe their general understanding of continuous assessment. All of the (six) Science teachers answered that continuous assessment is a task given to learners in order to assess teaching and learning. One teacher said:

> "According to me continuous assessment is tasks given to students during the teaching and learning process, such as tests, midterm tests, or terminal examinations." (T 1)

Another added:

> "To me, continuous assessments are planned activities given to learners during the teaching and learning process." (T 3)

These responses suggest that the Science teachers in Kibaha possess adequate knowledge about continuous assessment. All six teachers said that they accept that continuous assessment helps teachers to evaluate students' weaknesses, hence, improves the entire process of teaching and learning.

When asked to elaborate on the issue of continuous assessment and the teaching and learning process in Tanzania. One of the teachers said:

"I think, in Tanzania, continuous assessments are provided by teacher in every aspect; at school level… tasks provided are home works, weekly tests, monthly tests, projects, terminal or annual exams. Also, other assessments are conducted by school principals in respective zones (provinces) like mock examination, and Form Two exams under the school inspectors in the zone… there are three assessments: first, the assessment conducted by schools such as tests, quizzes, homework, practical and annual examinations; second assessment done by school inspectors like form two examination; third, assessment conducted by the zone (province) under the TANZANIA HEAD OF SCHOOLS ASSOCIATION (TAHOSA) such as mock examinations in Form Four and Six and also regional examination for Form Five." (T 5)

Researcher: How many zones are there in Tanzania? And are the entire classroom assessments equivalent, if not explain why?

"Mm…I am not sure, but I think we have 8 zones. The classroom continuous assessments are not the same in terms of questions types, time provided, moderation as well as marking schemes." (T 2)

These responses suggest that in Tanzania, continuous assessment is inconsistently applied across the zones.

The teachers were asked to explain the advantages of continuous assessment. Most viewed continuous assessment as enabling teachers to assess learner development, the syllabus and subject matter. They said:

"Advantages of continuous assessment are first, to evaluate students and teacher their strengths and weakness; second, to evaluate areas of difficulty so as to make remedial class; and third is to evaluate the strength and weakness of the curriculum." (T 3)

"Advantage of continuous assessment helps first to monitor teaching and learning process, second; it guide teachers to know if teaching process is effective and third it guide students to keep learning throughout the programme and motivate students to study hard." (T 4)

From the above responses, it appears that Science teachers in Kibaha understand continuous assessment as an important classroom assessment tool which enhances teaching and learning. It also helps to find new teaching strategies to improve the previous teaching and learning process through feedback.

With respect to the *disadvantages* of continuous assessment, all six of the Science teachers believed that continuous assessment is time-consuming especially in preparation practical tests, moderating and marking class assessments and also added workload to teachers. They added that it discouraged some of the learners, if not properly done. As one science teacher expressed:

"I think the disadvantage of continuous assessment is that all over the country classroom assessments vary from school to school depends on school culture and organizations, some schools give many tasks while others give few tasks." (T 6)

While two science teachers said:

"Disadvantage of continuous assessments is that if they provided many times in a term, it causes fair of coverage of the syllabus and if not well prepared it results in to poor student's performance." (T3)

"Continuous assessment hinders other activities to be implemented by wasting time for reviewing the previous ones." (T1)

Therefore, the Science teachers in Kibaha view classroom continuous assessment as taking a lot of time for preparation, moderation, marking and adding workload to classroom teachers.

The Science teachers were asked to explain how formative and summative assessment should be used. Generally, all six teachers shared their knowledge about continuous assessment and summative assessment; although they differed in their explanations. They saw formative assessment as a kind of evaluation done during the teaching and learning process including asking questions, group discussions, providing assignments, tests, project and homework; and summative assessment as used at the end of the course in order to evaluate the outcomes of learners' learning. As one science teacher articulated:

"Formative assessment should be used for diagnosing difficulty, check weakness of syllabus, assess weakness and development of teaching methods, weakness and achievement of students in the subject matter. And summative assessment should be used for selection of students for further studies according to their performance." (T 6)

Concerning teaching methodology, the Science teachers expressed that sometimes they used the lecture or participatory method depending on class size and school timetable. All six teachers commented that they use sometimes lecture method because of the large class size It also has the advantage of saving time and ensures that topics are covered quickly. During the interviews one science teacher said:

"I am teaching through interaction but sometimes lecture method depending on the situation based on class size, if the class size is too big, I prefer to use the lecture method because it serves time and topic covered." (T 5)

. The teaching lecture method linked with the previous studies found that sometimes science teachers employ lecture method (Chonjo et al. 1996, Osaki, 1996 and Zalia, 2007). This appears to give credence to the fact that in the Kibaha district, sometimes use lecture method (teacher-centered pedagogy) in classroom instructions. This implies that Kibaha science teachers follow (expository) or closed-inquiry instruction in the classroom. The non-inquiry (expository) teaching instructions do not promote the development of learner's investigative scientific skills and problem-solving skills (Herrenkohl & Guerra 1998; Trumbul & Slack, 1991; Hofstein & Lunetta, 2004; Domin, 1999).

4.1.3 Results from classroom observations

Classroom observation for Teacher T1

For T1, all of the observed class lessons were based on close-inquiry instruction where the teacher provides all including apparatus and steps to follow or procedures for calculating tasks were read instructions directly from the textbook. Teacher T1 was observed teaching Biology on the topic of Photosynthesis. She started the lesson by stating its objective of the topic. The general objective of the lesson was that learners should understand the relationship between photosynthesis and respiration in plant life.

The specific objectives were to:

- explain the meaning of photosynthesis and respiration;
- write the general equation of photosynthesis and respiration;
- explain the differences between photosynthesis and respiration;
- outline their similarities between photosynthesis and respiration;
- describe the relationship between photosynthesis and respiration.

The teacher introduced the lesson by asking learners for the definitions of photosynthesis and respiration, and continued to ask them to write the general equations for photosynthesis and respiration. Teacher T1 seemed to involve her students in effective interactions through questioning. However, only a few students responded to the questions. Generally, during the observed two lessons classes, the teaching method can be said to have been teacher-centered. T1 did not make a connection with the previous lessons. In terms of classroom management and

organization, the class was somewhat crowded with the number of learners at 70. Learners were well arranged in spite of the limited space. T1 did not manage to move around the class or attempt to scaffold the learner's learning. T1 was seen to use group work during the teaching. She seemed to lead learners through a sequence of questions and answers. She had group discussions involving six to seven students, but she did not manage to control and provide assistance to all groups.

One of the activities observed in the classroom of T1 involved learners comparing an Elodea leaf that had been covered completely with a piece of cardboard throughout the night and to another Elodea leaf that was not covered overnight. Teacher T1 asked learners "what happens to a leaf covered over the whole night and the leaf not covered the whole night"? When did respiration and photosynthesis take place? Is there a relationship between photosynthesis and respiration in plants? Learners were asked to go into groups and investigate the relationship between photosynthesis and respiration. However, the teacher did not allow enough time for learners to reflect on their thinking. The class had limited learner-learner interactions.

During the lessons, three learners had to share a Biological Science textbook between them. The school has no library and lacks computer facilities, including the internet. The teacher did not review learner activities during the lesson. She did not make inferences about learners' achievements during the teaching process. The tasks given to learner were not too complex. Moreover, the teacher always asked simple and straightforward questions. For example: "write down the general formula of photosynthesis and respiration". Such questions do not engaged learners in deeper thinking. Only a few of the learners responded frequently to the questions. T1 did not provide effective feedback to the students who asked questions. She did not manage to mark the learners' work during the lesson although at the end of the lesson, she gave the class an assignment. T1 did not use peer assessment or self-assessment during the lessons.

Classroom observation for Teacher T3

Teacher T3 followed a model of teaching instruction similar to teacher T1, which is based on the expository inquiry approach. T3 was observed teaching Chemistry. The class began on time at 8.00 a.m. The objectives of one of the observed lessons were clearly stated by the teacher as:

- State three properties of matter that are solid state, liquid state and gaseous state.
- Explain the properties of solid state, liquid state and gaseous state.
- Describe examples of each type of state of matter.

She introduced the concept of "states of matter" by asking learners for definition of matter, and continued to ask them to write down definitions of the three states of matter. The majority of learners raised their hands and showed that they had the right ideas. Probably, the concepts were taught in previous lessons. However, T3 did not make a/any further connection with the previous lessons. The classroom management and organization appeared good. The class was large with 65 learners. There was not enough space for the teacher to move around the class.

For two of the observed lessons, T3 appeared to direct her learners' observations. She did not give learners opportunities to describe what was happening. However, she used various teaching strategies to elaborate the meaning of state of matter, types, properties and examples. T3 used group work, but the learners' group activities contained low level of learner-learner and learners-teacher interactions. Most of time, the teacher asked questions to learners and learners responded with answers. Learners asked few questions. T3 instructed her learners to mention three states of matter, properties and their examples in group discussions involving five to six learners. However, the teacher did not have/ set aside enough time to check learners' activities during the lesson. In terms of the availability of teaching materials, especially text books, three or four learners shared a text book during the lesson.

T3 used questioning strategies to elicit learners thinking, but the questions asked were not too complex. For example; "Mention three state of matter, Give an example of a solid state, liquid and gaseous state." Such questions do not engaged learners in deep thinking. T3 also did not provide effective feedback to learners when asked questions. She did not manage to mark the learner's work, although at the end of the lesson, she also gave the class an assignment. T3 did not use peer assessment and self-assessment during the two lessons observed.

Classroom observation for Teacher T4

Teacher T4 also used similar teaching strategies to teacher T1 and T3. Throughout the two observed lessons, T4 seemed to provide prescribed procedures either in textbook or worksheet to his learners. He also provided apparatus and problems to the learners. T4 was observed teaching Biology on the topic of 'Classification'. In all two observed lessons, T4 clearly explained the purpose of lesson. For example in the first lesson, the objectives were to:

- Explain the distinctive properties of plant kingdom;
- Mention examples of plant kingdom such bryophyte, gymnosperm and angiosperm and their distinctive characteristics;
- Explain adaptation features of plant kingdom during the unfavorable conditions.

T4 introduced the lesson by asking student learners the definition of classification, and continued leading them to discuss the characteristics of the Plant Kingdom. However, the class discussions were basically characterized by the learner -centered approach. The majority of learners raised their hands indicating they had ideas. Probably because the lesson was interesting and the topic was familiar to learners. Thereafter, T4 made connections with the previous lessons through guiding questions. He went on to ask questions as he introduced the term classification. The classroom management and organization were good and the class had space with 45 learners. The teacher moved around demonstrating and guiding learners. He ended the lesson by providing learners with an exercise on the content of the previous day's lesson.

T4 used various teaching strategies to elaborate including organizing learners' group discussions, learners' tasks, and questioning. The class was moderately active and learners looked motivated to ask and respond to questions. The teacher frequently used questions to raise learners' attention. The school has adequate teaching materials, especially text books so there was little or no sharing of text books.

Learners were asked to discuss their work in groups and a group representative asked to present a summary from the group. However, there was no time for the whole class to discuss matters that rose during the discussions. T4 appeared to use questioning strategies to elicit learners' thinking.

Such questions encouraged and engaged learners in deeper thinking. He provided descriptive feedback to learners when asked questions.

4.2 Challenges faced by Science teachers when practicing continuous assessment

The results from the questionnaire and interviews on the Science teacher's challenges during the practicing of continuous assessment are presented here.

4.2.1 Results from questionnaire

In the questionnaire, Science teachers were required to indicate the challenges or problems they encountered when implementing continuous assessment by agreeing or disagreeing with given statements. Table 4.1 below summarizes the results.

Table 4.3 Science teachers' responses on the challenges faced in continuous assessment (n=50)

S/N	Question	Agreed % response	Disagreed % response
1	The instructions on how to conduct continuous assessment are clear and understandable to teachers	40%	60%
2	My school has sufficient resources to help me in setting tests and homework	34%	66%
3	I need some training on how to conduct continuous assessment	78%	22%
4	I use a computer to enter marks and analyze learners results	20%	80%
5	Tests should not be used to get marks for continuous assessment	30%	70%
6	Our school leadership supervise our conducting of continuous assessment adequately	60%	40%
7	The Head department supports me in carrying out continuous assessment	36%	64%
8	Sometimes extra curriculum influence the effectiveness of continuous assessment	84%	16%
9	Our school can do better in the way continuous assessment is administered and conducted	58%	42%
10	Learners from different classes in the same school are assessed in the same way in continuous assessment	64%	36%
11	Continuous assessment increases the workload for teachers	56%	44%
12	Learners have complained about the inconsistency of obtaining continuous assessment marks	76%	24%
13	Parents have complained about the inconsistency of obtaining continuous assessment marks	64%	36%
14	Always learners with high CA marks do pass highly final examination	76%	24%

15	Experienced teachers do better in conducting , administering and proper recording of learners marks than inexperienced teachers	84%	16%

Table 4.1 shows that the majority (60%) of the teachers were in disagreement with the statement "instructions on how to conduct continuous assessment (CA) are clear and understandable". This could mean that the majority of the teachers have difficulties in understanding the procedures and methods required in conducting continuous assessment. This finding supports Lissu (2008) who found that the document guidelines on conducting continuous assessment in secondary schools in Tanzania lacked some vital information. Lissu (2008) points out that the guidelines document lacked some instructions on how to assess learners' practical abilities in science subjects and how to merge practical and theory marks. This might lead schools not to assess practical skills effective, especially given the shortage of laboratory equipment. Although the National Examination Council of Tanzania have continuous assessment guidelines, it appears that the majority of teachers are experienced difficulties on how to use the guidelines for conducting continuous assessment. The NECTA guidelines clearly stipulate that: exercises (homework, class tests, and quizzes) carry 20%, terminal tests carry 25%, and project carry 5% making a total of 50%(NECTA, 1991).

Table 4.1 suggests that the majority of the Science teachers need more training on how to conduct continuous assessment. The majority (78%) of the Science teachers declared their need for some training on how to conduct continuous assessment. This supports Black and William (1998) assertion that continuous assessment helps teachers to adjust their teaching strategies to improve education learning goals. However, the intended learning goals could still not be achieved due to lack of teaching resources.

Table 4.1 also indicates that many of the science teachers (66%) consider schools not to have adequate teaching and learning resources to support the setting of tests and home works. This situation can lead to difficulties for teachers in implementing formative assessment. When the Science teachers were asked to indicate whether they used computer in assessing and entering students' assessment marks, only less than half said they did. The majority of Kibaha Science

teachers normally keep learner's marks in hard copies. This concurs with the findings of Tilya (2003), whose study of Tanzanian teachers support and use of Microcomputer Based Laboratories (MBL) in Physics showed that the majority of science teachers are computer illiterate. Additionally, most of the Science teachers possess inadequate pedagogical content knowledge pertaining to learning science with computers based laboratories link with previous studies showing difficulties in practicing classroom formative assessment (Thomas, 2001; Voogt, 2003). This is out of the new education policy document, which emphasizes the promotion of computer use in order to promote technological and scientific development (Tanzania Ministry of Education and Culture, 1995: 52).

Table 4.1 reveals that 30 out of 50 science teachers agreed that the school leadership e.g. head of department had an important role in conducting continuous assessment, with the majority saying they got some support from the school head and head of department in continuous assessment. This is supported by Zalia (2007) who insists that the school leadership should motivate, and encourage teachers and learners to improve classroom continuous assessment in their school. She adds that this supervision improves teaching and learning. The majority of the teachers (42) were of the view that sometimes extra-curriculum activities influence the effectiveness of continuous assessment. Furthermore, the results show that 76% of the Science teachers were of the opinion that learners with high continuous assessment marks also pass with high marks in the final examination.

With respect to teachers' workload, Table 4.1 shows that 56% of the teachers said continuous assessment increases the workload for teachers. The results of this study also reveal that 84% of the Science teachers agreed that experienced teachers do better in conducting, administering and proper recording of students marks than novice teachers. This finding is consistent with Pennycuick (1990) who found that novice teachers experienced more difficulties in implementing formative assessment. Science teachers also were asked to indicate whether continuous assessment may improve the teaching instruction in the classroom. The majority (92%) agreed that continuous assessment helps teachers improve their teaching. Regarding the role of continuous assessment marks in contribution to grading in the final examination, the majority of teachers (76%) said continuous assessment has a significant impact on the final

examination grade. However, the majority of the Science teachers (80%) disagreed that tests should not be used to get marks for continuous assessment. This shows that self-assessment, group work, oral assessment and feedback mechanism can improve effective learning outcomes.

4.2.2 Results from interviews and classroom observations

The results presented here are from the interviews and classroom observations.

Instructional barriers in the practice of continuous assessment

Instructional barriers may hinder science teachers practice and implementation of classroom continuous assessment as shown by previous studies (e.g. Kitta, 2004; Kibga, 2004; Osaki 1999). The Science teachers were asked to explain the instructional problems or challenges they encountered when administered and implementing continuous assessments. The majority of the sampled Science teachers mentioned inadequate teaching and learning resources, shortage of qualified science teachers, large number of learners, and high workload as the major instructional barriers to the implementation of continuous assessment in Kibaha district. Two of the science teachers expressed: "Sometimes, students are not ready to do tasks, workload to teachers, for example, me I have many periods to teach, no lab technician to help me especially in preparing chemicals for practical so I am supposed to prepare alone. Sometimes, I prefer to teach theoretically rather than to have practical. Also, another serious problem in schools there is shortage of Science teachers which results in high workloads for teachers." (T1)

"In schools, the number of students is high compared to qualified science teachers which contribute to failure to finish the syllabus on the time… lack of chemicals and apparatus in the lab during the practical as a result sometimes teachers decided to teach theory in practical sessions." (T4)

These statements are in line with previous studies done in Tanzania which revealed that the problems are the shortage of qualified science teachers, insufficient of teaching resources and high number of students in the classroom (see Osaki, 1999; Kibga, 2004; Zalia, 2007 and Lissu, 2008). In order to address the instructional challenges encountered when implementing continuous assessment, Science teachers need to explain how they are going to tackle the problems which are faced in conducting continuous assessment. The teachers explained that

more qualified teachers should be employed to reduce the workload of teachers. They added the need to have sufficient chemicals in the labs and reduce the number of learners. Two of the teachers expressed their ideas saying: "I always emphasize to my students to have a good handwriting and ask them to work hard so as to perform better." (T2)

"More science teachers employed…availability of teaching materials such as text books and chemicals in the labs so as students can do more practical otherwise we can't improve teaching and learning as well as continuous assessment." (T5)

In terms of the availability of textbooks in the classroom, results from classroom observations for class T1 and T3 show that during the class instruction, three or four students shared one textbook. This might in itself be a barrier to both teaching and implementation of continuous assessment. Teachers may not be able to give homework if some learners do not have textbooks. The teachers suggested that continuous assessment could be improved through close supervision when continuous assessments are conducted, and when more science teachers were employed and the number of learners reduced. One science teacher said: "After the final examination we evaluate the continuous assessment to know the progress of teaching and learning process." (T4) All six of the Science teachers recommended the use photocopier, chalkboard and computers in implementing classroom continuous assessments.

With regard to the responsibility of school leadership in monitoring continuous assessment, three of the Science teachers explained that the Headmaster needed to do more in providing teaching materials such as chemicals. Two teachers added that headmasters needed to help in providing plans and schedules for assessments. However, one teacher explained: "I think, nothing, there is no role for headmasters in monitoring continuous assessment." (T3)
This teacher saw the role of the Headmaster and the Head of Department in assessing learners as not that important. Regarding the professional development of teachers, five of the teachers indicated that they needed training in order for them to effectively and accurately assess learner's progress. Only one teacher said there was no need for training. Perhaps this teacher had obtained skills on assessment because she had taught at a special school which is under a private organization. One of the Science teachers expressed: "Exactly yes, because some teachers do not

know how and when to do continuous assessment and also the importance of continuous assessment. The training should focus on teaching and learning process." (T5)

This statement might mean science teachers possess inadequate pedagogical content knowledge on continuous assessment. Other two sampled science teachers said: "Yes I need training, in order to improve teaching and learning process. The training should focus on how to prepare tests in respect to teaching and learning process." (T1) "Yes, because things keep changing, so it is better to have training so that to copy with changes. Training should base on practical work, handling of laboratory, how to design and conduct practical." (T6)

From the above responses, it can be said that science teachers need training on how to administer and conduct formative assessment. This result is consistent with results from the questionnaire where the majority of the science teachers agreed that they needed more training on how to conduct continuous assessment. The findings of this study agree with Kitta (2004) who showed that a large number of science teachers in schools lack pedagogical subject knowledge and skills in teaching and learning process. Further the study suggests that there is a need for science teachers to obtain professional development to improve teaching and learning process.

The Science teachers were also required to describe whether the guidelines given on how to conduct continuous assessment were clear and understandable. Five teachers out of the six said that the guidelines were not clear and understandable. Two science teachers said: "No, are not clear and especially with this present in the new syllabus means competency based curriculum." (T3)

"Actually the guidelines instructions are not clear, thus, this is why the continuous assessment differs from one school to another depending on school leadership supervision." (T4)

As a whole, the Science teachers' responses suggest that the guidelines on continuous assessments are not clear and understandable. Moreover, this finding supports studies done by Lissu (2008) and Zalia (2007) which revealed that the guidelines on conducting continuous assessment were not clear.

Interestingly the teachers suggest a different focus for the continuous assessment. Three science teachers said: "We should assess in aiming to explore students' competence of subject matter

and not how students have crammed the content of subject matter." (T2) "More science teachers should be employed in order to reduce workload to teachers and also we should improve our laboratories with chemicals and advanced apparatus." (T4) "We can improve continuous assessment by make it to be more practical rather than theoretical perspectives." (T6)

Teachers do not normally assess learners according to what they claim. This was evidenced in classroom observations for T1 and T3 where most of the time teachers asked straightforward and simple questions to learners.

4.3 Discussion of findings

Generally, the results from the questionnaire, interviews correlate with classroom observation. This study revealed that the majority of teachers failed to implement proper continuous assessment because of: inadequate knowledge base on continuous assessments; unavailability of teaching and learning resources e.g. computers; large numbers of learners in classes; heavy teaching loads; and inadequate supports from the school administrators.

Fundamentally, the findings from the questionnaire and interviews associate with classroom observation which shows that the effective continuous assessment enhance to improve teaching instructions. The findings of the study also revealed that most of the classroom tasks given to learners are paper-and-pencil oriented and little involvement of self assessment, oral assessment and peer assessment. The findings correlate with previous scholars (Osaki, 1996; Lissu,2008), This is contrary to what scholars have recommended for formative continuous assessment activities (e.g. Zalia, 2007). It has been suggested that formative assessment should involve a variety of tasks including assessment of observational skills, use of checklists, portfolios, written tests (e.g. multiple choice, short answers, essay), self-assessment, oral presentations, interactive presentations, student projects, interviews, problem-solving, projects, homework, take home tests, and inventories e.g., attitude, interest and learning styles.

The results from the questionnaire, interviews and classroom observations show a link between the teachers' practices in continuous assessments and their use of teaching styles. However, further evidence for this is required and can be the subject of another investigation. Learners are

not provided with enough opportunities to engage in deep information processing and development of investigative skills in problem-solving. Rather, classroom assessments sometimes focus on the recall of information and lower level cognitive demands. This study supports this claim as it shows that the majority of science teachers prefer sometimes to teach through the lecture methods because it saves time. However, the findings show that the Science teachers regularly give their learners assessment tasks such as tests and homework rather than oral assessment, self-assessment, and peer assessment during teaching instructions.

Regarding the assessment of practical work through practical tests, the Science teachers in the Kibaha district face many problems including the shortage of apparatus and chemicals. As a result, the majority of science teachers can manage to assess learners' practical tests twice per month. However, in spite of all this it is heartening to note that the science teachers make an effort to assess practical work depending on the availability of chemicals in their labs and the number of learners in the class. If the numbers are high, all the science teacher can do is assessing practical twice per term or at the end of the final year in external examinations (see, Osaki, 1996; Kibga, 2004; Zalia, 2007; Lissu; 2008). Indeed, five of the schools in the Kibaha district do not have a real laboratory which forces the teachers to make an alternative to practical tests in the final examination. Improving the laboratory facilities at these schools might go a long way towards changing continuous assessment practices. Science teachers might cease to concentrate on theoretical aspects and do more practical work.

Results from this study show that in all observed lessons, peer and self-assessment are not practiced in the classroom. Most of the time, learners do not get enough time for engaging in discovering new knowledge by building on prior experience. This practice is contrary to the constructivist approach where learners are expected to apply prior knowledge to build new scientific concepts. The results from the questionnaire, interviews and classroom observations indicate similar results that most of the secondary schools in Kibaha district have insufficient teaching and learning resources. This is evidenced from the interviews, where the majority of teachers said they did not have access to use of computers for entering and recording learners' assessment marks. As one of the interviewed teachers summed up: "I always use handwriting in

entering and recording my students' continuous assessment marks. Actually, I am always tired due to this heavy duty especially when you have large numbers of students in your class."

Teacher instructional styles are linked to the availability of teaching and learning resources. As Zalia (2007) point out, the selection of instructional practices is determined by the teaching conditions. Teachers working in under-resourced classrooms are likely to use the closed-inquiry approach. The high teacher workload is a big problem in the Kibaha district. The teachers sampled in this study are complaining that continuous assessment increases the workload for teachers. This is supported in the findings of earlier studies (Osaki, 1999; Kibga, 2004; Lissu, 2008; Mafuniko, 2006).

Another challenge faced by the Kibaha Science teachers is the inadequate or insufficient professional training and development. Results from both questionnaire and interviews show that the majority of teachers agreed that they need professional training on conducting continuous assessment. In the interviews, five out of six teachers said they need training on how to conduct continuous assessments, specifically on how to prepare practical tests and projects. In addition to the classroom observation, all three of the observed classes show that learners followed prescribed instructions from the teachers to perform specific problems. According to Hofstein and Lunetta (2004), this low-inquiry practice of teachers defeats the whole purpose of science education.

4.4 Conclusion

The analysis and discussion was generally focused on teachers' practices and challenges in conducting continuous assessment. The Science teachers in Kibaha district believe that continuous assessment helps both teachers and learners in evaluating the strengths and weakness in teaching and improving the learners' achievement. The study suggests that there is connection between the teachers' practices continuous assessment and instructional teaching styles employed in the classroom. Good teaching instructions practices improve the quality of continuous assessment. Results from the questionnaire and the interviews showed that a large proportion of the Kibaha Science teachers have experienced difficulties in the practice and

implementation of continuous assessments due to instructional barriers such as lack of laboratories, availability of texts books, large numbers of learners in the classroom, and insufficient of qualified science teachers. In the following chapter, the conclusion, implications, and recommendations of the study are presented.

CHAPTER FIVE: CONCLUSION, IMPLICATIONS, AND RECOMMENDATIONS

5.0 Introduction

The aim of this study was to investigate science teachers' practices and challenges when administering and implementing continuous assessment in the Kibaha district. In particular, this study explored the nature of science teachers' practices in continuous assessment. It also examined the challenges faced by the science teachers during implementing continuous assessment in the classroom. The study was guided by two research questions, which are the following:

1. What is the nature of science teachers' practices in conducting continuous assessment?
2. What are the challenges faced by science teachers in conducting continuous assessment?

The results and discussions from chapter four lead to three main conclusions:

- The Science teachers understand the value of continuous assessment in teaching and learning process. This study shows that good practices of teaching instructions practices enhance the quality of classroom continuous assessment.
- The Science teachers employ verification classroom activities and non-inquiry instructional practices when administering and implementing continuous assessment.
- The Science teachers' face many challenges in continuous assessments. These include: inadequate knowledge base on continuous assessments; unavailability of teaching and learning resources e.g. computers; large numbers of learners in classes; heavy teaching workloads; and inadequate support from the school administrators.

5.1 Conclusions from the questionnaire, interviews and classroom observation data

5.1.1 The nature of the science teachers' practices in continuous assessment

The (STPCCA) (Appendix A) elicited science teachers' practices in continuous assessment focusing on feedback, remediation and how they use assessments to improve teaching in their classrooms. The results show that most of Kibaha Science teachers frequently give tests to learners, about once per week, gave homework regularly and assessed practical work twice per month. These results suggest that the majority of science teachers assess theoretical aspects more frequently than practical work in the laboratories. Similar results were obtained from the interviews and classroom observations. The results also show that sometimes, science teachers use the lecture teaching method in the classroom. This is contrary to contemporary recommendations in Science Education, which emphasize use of the laboratory work to help learners in developing and understanding science through scientific investigations (Hodson, 1993; Hofstein & Lunetta, 2004; Ottander & Grellson, 2006). As a whole, all science teachers agreed that continuous assessment enables to improve the quality of teaching and learning process. Moreover, the results also show that the majority of sampled science teachers said they frequently re-teach topics and use remediation with their learners. Concerning feedback, the majority of the teachers said they provide feedback to their learners depending on the numbers of learners in the class.

5.1.2 Challenges faced by teachers when conducting continuous assessment

The results of this study show that a large number of the sampled science teachers see the guideline on how to conduct continuous assessment as somehow are not clear and understandable. This result is consistent with earlier studies, for example by Lissu, (2008) which revealed that in Tanzania, the guidelines on how to conduct continuous assessment are not clear. As Lissu, (2008) comments, throughout the document, there are no explanations on how to assess learners' practical skills as well as how to merge practical and theory marks to obtain learners' continuous assessment marks. Therefore, there is a need for the (NECTA) to revise the guidelines so that they are clear and understandable to Science teachers and educators. This may lead to improved uniformity in assessing classroom continuous assessment amongst the secondary schools.

The study also revealed that Kibaha secondary school teachers face several obstacles in conducting continuous assessment. These include insufficient teaching resources such as textbooks, chemicals and reagents used in the practical activities, lack of computers, shortage of qualified science teachers and large numbers of learners in the class. Lack of instructional resources may hinder the effectiveness of science teachers in implementing continuous assessment. It also appears that there are links between how teachers practice assessment such as tests, homework and practical work and the availability of instructional resources like textbooks, chemicals, photocopier and computers. However, this requires further investigation.

In order to practice effective continuous assessment, the majority of the sampled Science teachers suggest that they need more training on how to prepare and conduct continuous assessment, especially on how to construct tests, projects and practical work. The preparation of science teachers is crucial in this regard. Therefore, there is a need for the Tanzanian government to have detailed/carefully considered long and short term plans for the preparation of teachers and continuous professional development through in-service training, coaching and mentoring

5.2 Implications and recommendations

The findings of this study also have implications for teaching pedagogy specifically when teachers practice continuous assessments. Results from both interviews and classroom observation shows that most of the science teachers in Kibaha secondary schools sometimes they employed expository inquiry or closed-inquiry instructional styles instead of an open-inquiry oriented approach. This result is inconsistent with recommendations in the new Tanzanian Science curriculum which emphasizes the open-inquiry approach. The new science syllabus emphasizes learner centered activities, understanding of the nature of science through scientific investigation, open inquiry instructions and problem solving. Therefore, there is need for science teachers to have pedagogical content knowledge, scientific investigation and authentic inquiry skills in solving problems.

Additionally, this study revealed that most of the science teachers do not use oral assessment, peer assessment and self-assessment. This is evidenced in interviews where the majority of

sampled science teachers believed that continuous assessment was time consuming in terms of preparation and marking of tests, homework, projects and practical work. As a result most of the activities given to students are paper-and-pencil oriented and textbooks with emphasis on measuring low cognitive abilities through verification and guided inquiry. There is a need for policy makers and curriculum developers to revise the science syllabus to give more weight to authentic continuous assessments such as projects and practical work which are more on performance-based activities to improve classroom assessments in science subjects.

For effective practice of continuous assessment, the school leadership should supervise and monitor the progress of teaching and learning processes specifically focusing on assessments. Also, the principals must support and give incentives to teachers to encourage remedial teaching and extra classes. The school leaders should encourage science teachers to prepare continuous assessment action plans, log books, practical tests, projects through interdepartmental workshops or seminars aimed at developing teachers' investigative and problem solving skills. This might lead to collegiality and collaborative team work amongst science teachers.

Since this study concentrated only one district, Kibaha, the research findings might not be representative of the whole population of Tanzanian science teachers. In order to get generalizable results, there is need to do the survey which covers a larger sample of science teachers and more than one district of Tanzania. Also, a study could be conducted to investigate the challenges faced by science teachers in implementing practical work in secondary schools. Furthermore, a possible further research should be an evaluation of continuous assessment activities carried out in the classroom. This would provide national classroom evaluations which improve the effectiveness of the continuous assessment.

5.3 Limitations of the study

This study used triangulation as a technique which helped to enlighten the phenomena under investigation. Triangulation helped to improve the validity of the claims made. However, the sample used in this study was too small to be regarded as representative of the entire population of Tanzania. For this reason, all the major conclusions made in this study are essentially only

applicable to the selected sampled, the Kibaha Science teachers and not to Tanzania at a large. However, it is hoped that the conclusions made here will be valuable to science teachers in the whole Tanzania because they can learn from the experiences of the Kibaha teachers.

5.4 Conclusion

The conclusions made in this chapter were based on the findings from the study aimed to investigate the science teachers' practices and challenges in continuous assessment. Recommendations were made for both for science teaching and research. It was noted that science teachers need to apply scientific investigative skills when implementing and practicing classroom assessment instead of relying on text book. School leadership should also be accountable in supervising and monitoring continuous assessment. Another recommendation made was the need to review the science syllabus so that it can measure and give more weight to practical work and projects which emphasizes hands on activities and inquiry skills and problem-solving.

This study shows that the findings from questionnaire and interview links with the classroom observations. Fundamentally, continuous assessment is significant role in improving the quality of teaching and learning science subjects. Science teachers should possess an adequate subject matter, pedagogical content knowledge to develop and improve teaching and learning strategies. Therefore, there is a necessitates for the government to have short and long plans of in-service and preservice teachers' professional training based on how to conduct the continuous assessment. It is sad to note that the lack of instructional resources is a serious challenge to teachers' continuous assessment practices. There is a need to address the issues concerning the availability of teaching resources such as text books and computers to improve continuous assessment in the classroom. There is also a necessitate to have continuous assessment (CA) implementation committee in school levels for evaluation of efficiency of classroom continuous assessment.

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APPENDICES: **Appendix A**

Science Teachers' Practices and Challenges in Continuous Assessment (STPCCA) Questionnaire

Part A: General understanding of continuous assessment or formative assessment

Please put cross (X) in the appropriate space in the table below to indicates your responses to give specific statements.

Number	Statements	Responses	
	PART A	Agreed	Disagreed
1	I give my learners tests weekly		
2	I give my learners homework everyday		
3	I give my learners homework every week		
4	I give my learners a practical test every week		
5	I give my learners a practical tests every month		
6	I never give my learners a practical test		
7	The tests I give to my learners are always fair		
8	I give learners a class exercise during every lesson		
9	I always give learners feedback in time		
10	I always mark learners' work fairly		
11	I always give a colleague my test to moderate		
12	I use test results to revise work poorly done by learners		
13	I use learners answers in tests and home works to improve my teaching		

14	I always re teach a topic when learners fail a test		
15	I always analyze learners performance in a test or home works		
16	I do remedial work when learners have performed poorly in a test or homework		
	PART B		
1	The instructions on how to conduct continuous assessment are clear and understandable		
2	Continuous assessment helps teachers improve their teaching		
3	My school has sufficient resources to help me in setting tests and home works		
4	Continuous assessment marks have no any significant contribution in grading final examination		
5	I need some training on how to conduct continuous assessment		
6	I use a computer to enter marks and analyze learners results		
7	Tests should not be used to get marks for continuous assessment		
8	Learners from different classes in the same school are assessed in the same way in continuous assessment		
9	Continuous assessment provide opportunity to learners to evaluate their weakness and strengths in the learning process		
10	My HOD supports me in carrying out continuous assessment		
11	Continuous assessment is not good system for assessing student's academic performance		
12	Our school leadership supervises our conducting of continuous		

	assessment adequately		
13	Experienced teachers do better in conducting, administering and proper recording of learners marks than inexperienced teachers		
14	Always learners with high continuous assessment marks do pass highly final examination		
15	Our school can do better in the way continuous assessment is administered and conducted		
16	Sometimes extra curriculum influence the effectiveness of continuous assessment		
17	Continuous assessment increases the workload for teachers		
18	Learners have complained about the inconsistency of obtaining continuous assessment marks		
19	Parents have complained about the inconsistency of obtaining continuous assessment marks		

APPENDIX B

Science Teachers' Practices and Challenges faced in Continuous Assessment (STPCFCA) Interview Guide

Part A: Demographics information

School……. Title…….. ……

Continuous assessment has both strengths and weakness towards attainment of the set educational goals. The aim of this study is to examine your perceptions, practices and challenges in continuous assessment. Please, provide appropriate responses according to your understanding. Your responses will be treated confidentially.

1. What is your sex? Male ……. Female ……..
2. What is your highest level of education qualification? ……..
3. How long have you been a teacher in ordinary level? ……

   00-03years

   04-07 years

   08 -10years

   0ver 10 years
4. What subject(s) do you teach?

Part B: General understanding for Science teachers in continuous assessment

1. What do you understand the term continuous assessment?
2. How do you understand continuous assessment in relation to teaching and learning process?
3. What perceptions do you have towards continuous assessment?
4. What are the strengths of continuous assessment?
5. What is the weakness of continuous assessment?

   .

Part C: Nature of teacher practices in continuous assessment

6. How do you consistently evaluate your students? Daily, weekly, monthly, once per term.

7. The continuous assessment works are marked and recorded after two days, one week , one monthly or once a term.
8. Explain steps used in computing the continuous assessment marks.
9. Where do keep the continuous assessment marks? In principal office, academic office, teachers home, deputy office.

   .
10. What are the major advantages of the assessment tools used to obtain continuous assessment marks for science subjects?
11. What are the disadvantages of the assessment tools used to obtain continuous assessment marks for science subjects?

12. In your view, how continuous assessment tools contributes to students 'performance in final examinations?.

Part D: Challenges faced science teachers in practices in the use of continuous assessment

13. What challenges do you faced in conducting continuous assessment?
14. What measures do you take to address challenges related to continuous assessment?
15. Students with high continuous assessment mark in science subjects do not necessarily pass highly in their final examination. What are the causes for this unexpected anomaly...
16. What are your recommendations to improve the quality of continuous assessment?

APPENDIX C

CLASSROOM OBSERVATION GUIDE

Generally, the observation was guided by a deliberate effort to capture the following:

1. Did the teacher give feedback?
2. How was feedback given?

3.How frequently were continuous assessment tasks given?

- What was the role of questioning in the teaching and learning process?
- What was the frequency of questioning and answering?
- Were class exercises given? What was their purpose?
- Did learners have autonomy to ask questions?
- Was there evidence of self-assessment?
- Intended teaching and learning goal achieved
- Presentation of introduction and conclusion of the lesson
- Management and organizations of classroom
- Tasks and activities to elicit evidence of learning
- Availability and distribution of teaching resources
- Interaction between teacher and learners and also among learners
- Teaching strategies
- Questioning strategies to elicit students thinking
- Types of assessments given learners
- Teaching approach used for examples, verification, solving problems, discovery, investigative, guided inquiry, expository and non expository.

APPENDIX D: INTERVIEW TRANSCRIPTS

Interview transcript for teacher (T1).

Teacher	**T1**
Date:	**11.09.2012**
Time:	**±60 min**
Interviewee:	**T1**
Interviewer:	**R (R =researcher)**
Gender:	**Female**
Level of education qualification:	**Degree**
Experience teaching science subject:	**06 years**
Teaching science subject:	**Biology**

R: Good morning, teacher

T1: Morning

R… I am interesting to know about continuous assessment. From your own experience, what to you is continuous assessment?

T1: Okay, to me continuous assessment is a process where teacher (s) provides class activities to students such as tests.

R: what can you say about continuous assessment with regard to teaching and learning process in Tanzania?

T1: You mean a continuous assessment in teaching and learning?

R: Yes

T1: Is students tasks provided by teacher as I have already explain

R: Another question is, what do you think advantages of continuous assessment?

T1: MM... Advantages of continuous assessment are to assess student development, weakness, syllabus and subject matter.

R: Okay, how should formative and summative assessment be used?

T1: Formative assessment should be used for diagnosing difficulty , check weakness of syllabus, assess weakness and development of teaching methods, weakness and achievement of students in the subject matter. Also to predict the result of summative assessment. And summative assessment should be used for selection of students for further studies according to their performance

R: Okay, can you describe the way you teach?

T1: Yes, I can. I teach theory by using lecture, participatory methods such as group discussion and presentation and also practical by demonstrating and guiding students to discover the results.

R: Another question is, what do you think about the quality of exams in Tanzania?

T1: The exams measure content of subject matter by making read, claim and produce what they have claimed in paper

R: Let move to another part based on how you practices the continuous assessment. In your view, why is continuous assessment important?

T1: Yes… Continuous assessment is important because it help to discover difficulty areas in syllabus to check strength of my teaching, to grade students

R: Okay and how often do you assess your students? Daily, weekly, monthly or once per term?

T1: Yes, I assess weekly

R: What types of assessment tasks do you give to your students? For example, types of tests.

T1: I give exercise

R: How often do you give each of the following tasks for assessment? Tests, homework, class assignments, projects, group tasks, practical tests, practical exercise, and quizzes.

T1: I give tests …weekly, homework….daily and group tasks for weekly.

R: Okay let move to another question, what factors do you consider when setting assessment tasks?

T1: I consider area that I covered according to syllabus

R: Do you evaluate the cognitive demands of your tasks e.g. Tests?

T1: Yes

R: When you prepare a test do you always have a marking scheme or assessment rubric?

T1: no

R: Okay, do you ask other colleagues to moderate your tests?

T1: no

R: can you describe the way you mark students' work, tests, practical, and assignments?

T1: Okay, after students doing exams I mark the work of my students alone

R: And then after you have given work, how long does it take for you to give feedback to the students?

T1: mmm … it depend with number of students but not more than two weeks

R: What do you do when giving feedback to students on a tests, homework, practical etc?

T1: I make correction to the question that they haven't attempt well and telling them way that questions were supposed to be attempted

R: Okay, what do you do when the majority of your students fail a test or assignment?

T1: I do remedial teaching for particular topic and ask students to do the exam again

R: And how do you handle and organize assessment marks?

T1: I organize by handwriting and calculating using calculator

R: The last question in this part is, do you use a computer to handle students' marks? And which computer programmes do you use?

T1: No

R: Let move to the last section based on challenges faced in practices continuous assessment. What problems have you encountered in conducting continuous assessment?

T1: Some students have bad hand writing and also most of students are not performing well

R: Okay, have you done to address the challenges you faced in continuous assessment?

T1: Yes, I always emphasize students to have a good hand writing and asking them to work hard so as to perform better

R: In what ways can continuous assessment be improved in Tanzania? At your school?

T1: After the final exam we evaluate the continuous assessment

R Okay, do you think Tanzanian teachers need training in conducting continuous assessment? Explain

T1: Exactly, Yes. Because some teachers do not know how and when to do continuous assessment and also the importance of continuous assessment

R: A if yes, what should this training focus on?

T1: Should focus on teaching and learning process

R: In your school, what resources do you use in continuous assessment? Photocopier, chalkboard, computer?

T1: Photocopier and computer

R: Okay, what are the roles played by your head of department (HOD), your headmaster, in what you do in assessing students?

T1: Nothing

R: how can we in Tanzania improve the way we assess Learners?

T1: I think, we should assess in aiming to explore students' competence of subject matter and not how students have claimed the content of subject matter

R: Last question, do you think the instructions given to teachers on how to conduct continuous assessment are clear and understandable?

T1: No are not clear, and especially with this competency based curriculum

R: Thank you

T1: Thank you too.

Appendix 4: 2 **Interview transcript for teacher (T2).**

Teacher: **T2**

Date: **12.09.2012**

Time: **±60 min**

Interviewee: **T2**

Interviewer: **R (R =researcher)**

Gender: **female**

Level of education qualification: **Degree**

Teaching experience: **03 years**

Teaching subject: **Biology**

R: Hi, teacher Good afternoon

T2: Good afternoon

R: I am interesting to know about continuous assessment. From your own experience, what to you is continuous assessment?

T2: According to me, continuous assessment is an evaluation during teaching and learning process so as to assess students' performance.

R: What can you say about continuous assessment with regard to teaching and learning process in Tanzania?

T2: In Tanzania continuous assessment in teaching process is done to identify teacher and students' weakness as well as the syllabus.

R: Third question is, what do you think are the advantages of continuous assessment?

T2: I think the advantages are first, to provide feedback both to teachers and students; second, to improve teaching and learning process.

R: And what do you think are the disadvantages of continuous assessment?

T2: I think it discourage some of the students

R: What the reasons of discourage students?

T2: Because if it is not effectively monitored it is useless

R: Okay, how should formative and summative be used?

T2: Formative should be used within the ongoing teaching and learning process, but summative should be used at the end of the course.

R: I would like you to describe the way you teach?

T2: Am teaching through interaction but sometimes lecture method depending on the situation based on class size.

R: Okay if the class size is too big, which method does prefer to use? And explain the reasons.

T2: lecture method because it serves time and topic covered

R: Let's move to another question, what do you think about the quality of exams in Tanzania?

T2: Yes the qualities of exams are good, since they are reliable and valid.

R: How often do you assess your students? Daily, weekly, monthly, once per term?

T2: Yes, I assess monthly

R: And what types of assessment tasks do you give to your students? E.g. Types of tests.

T2: Home works and tests.

R: How often do you give each of the following tasks for assessment?

T2: Actually, after two weeks

R: Okay, what factors to consider when setting assessment tasks?

T2: I consider the coverage and time table

R: Do you evaluate the cognitive demands of your tasks, e.g. tests?

T2: Yes

R: When you prepare a test do you always have a marking scheme or assessment rubric?

T2: yes

R: Can you ask other colleagues to moderate your tests?

T2: Yes

R: Can you explain the way you mark students' work, tests, assignment, etc

T2: I mark fairly

R: And after you have given work, how long does it take for you to give feedback to the students?

T2: I always give feedback after one week

R: Can you describe the way you mark students' work.

T2: I make basis on understanding

R: What do you do when giving feedback to students on a tests, homework etc?

T2: I do correction

R: What do you do when the majority of students fail a tests or assignment?

T2: I do extra teaching

R: How do you handle and organize assessment marks?

T2: I handle continuous assessment in special books for continuous assessment

R: Where do you keep students' continuous assessment marks?

T2: I keep in my department office

R: Do you use a computer to handle students' marks? Which computer programmes do you use?

T2: No, am not using computer.

R: Another question based on challenges that you were faced in conducting continuous assessment. Can you describe challenges / difficulties you encountered when conducting continuous assessment?

T2 Mmh… challenges we have are limited time and facilities like computer for preparing and handling students work

R: What have you done to address the challenges you faced in continuous assessment?

T2: I try to utilize time effectively

R: Okay, in what ways can continuous assessment be improved in Tanzania? At your school?

T2: By close supervision when the continuous assessments are done

R: Do you think Tanzanian teachers need training in conducting continuous assessment? Explain your answer.

T2: Sure, they need training so as to make it more effective

R: If yes, what should this training focus on?

T2: It should focus on how continuous assessment can be conducted and the time

R: What resources do you use in continuous assessment? Photocopier, chalkboard, computers.

T2: I use photocopier and chalkboard

R: Can you describe the roles played by your HOD, your headmaster, in what you do in assessing students?

T2: Yes, can help me by providing equipments like photocopy and chalkboard

R: Okay, how can we in Tanzania improve the way we assess learners?

T2: We can improve it by randomly assessment and not timely

R: Last question is do you think the instructions given to teachers on how to conduct continuous assessment are clear and understandable?

T2: Yes, they are clear and understandable.

R: Thank you teacher

T2: Thanks.

Appendix 4:3. **Interview transcript for teacher (T3).**

Teacher: **T3**

Date: **13.09.2012**

Time: **±60 min**

Interviewee: **T3**

Interviewer: **R (R =researcher)**

Gender: **female**

Level of education qualification: **Degree**

Experience in teaching science: **07 years**

Teaching science subject: **chemistry**

R: Good morning

T3: Morning

R: I am interesting to know about continuous assessment. From your own experience, what to you is continuous assessment?

T3: Yes, to me continuous assessment is ongoing process where teacher (s) gives tasks to students such as tests

R: What can you say about continuous assessment with regard to teaching and learning process in Tanzania?

T3: You mean continuous assessment in teaching and learning?

R: Yes

T3: I think in Tanzania aa continuous assessment are provided by teacher in every aspects, in school level task provided are home works , weekly tests, monthly tests, projects ,

terminal or annual exams. Also other assessments are conducted by school principals in respective Zone (province) under the like mock examination, and form two exams under the school inspectors under the zone.

R: How many Zones we have in Tanzania? And all the exams are equivalent, if not explain why?

T3: Mmh …I m not sure, but I think we have 08 Zones. The exams are not the same in terms of questions types, time provided, moderation as well as marking schemes.

R: Let move to another question, what do you think advantages of continuous assessment?

T3: Advantages of continuous assessment are first, evaluate students and teacher their strengths and weakness; second, evaluate areas of difficult so as to make remedial class; and third is to evaluate strength and weakness of the curriculum.

R: What are the disadvantages of continuous assessment?

T3: Disadvantage of continuous assessment is that over the country it vary from school to school, some give many tasks while others schools give few tasks

R: Okay, how should formative and summative assessment is used?

T3: Formative should be used within the ongoing teaching and learning process, but summative should be used at the end of the course.

R: Can you describe the way you teach?

T 3: Yes, I can explain the way I teach. In my teaching I use participatory method in both theory part and practical part.

R: The other question is, what do you think about the quality of exams in Tanzania?

T3: Quality of education in Tanzania is somehow good, even though there are some weaknesses in conducting practical exams; most of the schools have not well equipped laboratories

R: Okay, Let me now move to another part based on how you practice the continuous assessment. In your view, why is continuous assessment important?

T3: Yes, Continuous assessments help me to evaluate my students' strengths and weakness

R: How often do you assess your students? Daily, weekly, monthly or once per term?

T3: Yes I do assess my students after every lesson by asking oral questions, giving assignments.

R: What types of assessment tasks do you give to your students? For example, types of tests.

T3: I use to give them home works, and weekly tests.

R: And how often do you give each of the following tasks for assessment? Tests, homework, class assignments, projects, group tasks, practical tests, practical exercise, and quizzes.

T3: I give those tests …monthly, homework….weekly, class assignments at the end of every lesson, project per year, group tasks for weekly, practical tests per term, practical tests for weekly, and quizzes in every lesson

T3: What factors do you consider when setting assessment tasks?

T3: I consider content coverage, time and learners capacity.

R: Do you evaluate the cognitive demands of your tasks eg. Tests?

T3: Yes

R: When you prepare a test do you always have a marking scheme or assessment rubric?

T3: Yes I do

R: Okay, do you ask other colleagues to moderate your tests?

T3: Yes I do

R: Can you describe the way you mark students' work, tests, practical, and assignments?

T3: I should prepare marking scheme first, provide a marks on each question according to its weight and if a tests contain let say five questions, I will mark question number one to all papers followed by second to the last

R: And then after you have given work, how long does it take for you to give feedback to the students?

T3: mmm … not more than a week, but sometimes there are interference with school time table

R: What do mean interference with school timetable?

T3: I mean class –teaching sessions may interfere with extra curriculum activities.

R: What do you do when giving feedback to students on a tests, homework, practical etc?

T3: I make correction

R: Okay, what do you do when the majority of your students fail a test or assignment?

T3: I use to encourage students who score poorly so as next time to perform better and motivate those who perform high to maintain their level

R: how do you handle and organize assessment marks?

T3: I keep the assessments marks on portfolio

R: Last question in this part is, do you use a computer to handle students' marks? And which computer programmes do you use?

T3: No

R: Let move to the last section basis on challenges faced in practices continuous assessment. What problems have you encountered in conducting continuous assessment?

T3: Sometimes students are not ready to do tasks, work load to teacher, examples Me, I have many period to teach, inadequate of qualified science teachers.

R: Okay, have you done to address the challenges you faced in continuous assessment?

T3: Yes, I always encourage my students to work hard so that they can perform better.

R: In what ways can continuous assessment be improved in Tanzania? At your school?

T3: I think, more science teachers should be employed

R: And do you think Tanzanian teachers need training in conducting continuous assessment? Explain

T3: Yes, In order to improve teaching and learning process.

R: And if yes, what should this training focus on?

T3: Should focus on how to prepare tests in respects to teaching and learning process

R: Okay, in your school, what resources do you use in continuous assessment? Photocopier, chalkboard, computer?

T3: Photocopier and computer

R: What are the roles played by your HOD, your headmaster, in what you do in assessing students?

T3: Yes, especially in practical the HOD must make sure that the chemical required are available

R: How can we in Tanzania improve the way we assess Learners?

T3: I think, more science teachers should employed in order to reduce workload to teachers and also we should improve our laboratories with chemicals and advanced apparatus

R: Last question, do you think the instructions given to teachers on how to conduct continuous assessment are clear and understandable?

T3: No are not clear.

R: Thank you for your contributions

T3: Thank you too.

Appendix 4.4: **Interview transcript for teacher (T4).**

Teacher **T4**

Date **14.09.2012**

Time: **± 60 min**

Interviewee: **T4**

Interviewer: **R (R =researcher)**

Gender- **Male**

Level of education qualification: **Degree**

Experience in teaching: **05 years**

Teaching subject: **physics**

R: morning teacher

T4: Morning

R: I am interesting to know about continuous assessment. From your own experience, what to you is continuous assessment?

T4: According to me continuous assessment is tasks given to students during the teaching and learning process such as tests, midterm tests, or terminal examinations.

R: And what can you say about continuous assessment with regard to teaching and learning process in Tanzania?

T4: I think in Tanzania a continuous assessment is part and of summative assessment, because all assessments at the end of a day they send to the NECTA (National Examination Council of Tanzania)

R: Let move to another question, what do you think advantages of continuous assessment?

T4: Advantages of continuous assessment are first, it monitor the teaching and learning process, second; it guide teacher to know if teaching process is effective and third it guide students to keep learning throughout the programme

R: What are the disadvantages of continuous assessment?

T4: Disadvantage of continuous assessment is that if they provided many times in a term, it cause the fairly of coverage of the syllabus

R: Okay and how should formative and summative assessment is used?

T4: Formative and summative assessment should be used effectively to support learning process, and should be conducted in uniformly to all schools rather than be randomly.

R: Can you describe the way you teach?

T 4: Yes, I can describe the ways I teach. I prepare lesson notes, lesson plan and I use my period to teach participatory method and lecture method

R: And, what do you think about the quality of exams in Tanzania?

T4: The quality of education in Tanzania is good, it cover what students learn.

R: Okay, Let me now move to another part based on how you practice the continuous assessment. In your opinion, why is continuous assessment important? Did you agree, explain.

T4: Yes, I agree that continuous assessment is important simply because Continuous assessments help me to evaluate my students' strengths and weakness as well as teaching progress

R: Okay, how often do you assess your students? Daily, weekly, monthly or once per term?

T4: Yes, I assess my students daily a mean during teaching through oral questions and weekly tests.

R: What types of assessment tasks do you give to your students? For example, types of tests.

T4: I give them home works, weekly tests, midterm tests, terminal exams and annual exams

R: How often do you give each of the following tasks for assessment? Tests, homework, class assignments, projects, group tasks, practical tests, practical exercise, and quizzes.

T4: I give students tests …monthly, homework….weekly, class assignments at the end of every lesson and project per year

R: What factors do you consider when setting assessment tasks?

T4: I consider cognitive domain, content coverage, and time management and learners capability.

R: Do you evaluate the cognitive demands of your tasks e.g. Tests?

T4: Yes

R: When you prepare a test do you always have a marking scheme or assessment rubric?

T4: Yes, I do

R: Okay, do you ask other colleagues to moderate your tests?

T4: Yes, we work as team in our department

R: Can you describe the way you mark students' work, tests, practical, and assignments?

T4: Marking is base on marking scheme which I prepare and for explanation questions I base on ideas of students

R: And then after you have given work, how long does it take for you to give feedback to the students?

T4: Okay it takes about one week to give feedback, also depend on number of students

R: And what time takes if the number students are too large?

T4: It takes more than two weeks

R: Can you describe the way you mark students' work

T4: I prepare marking scheme with marks rewarded to each question and I start to mark question wise I mean one question to all students and then another question to all students until the end of questions.

R: What do you do when giving feedback to students on a tests, homework, practical etc?

T4: When I give feedback to my students, I identify the area which done wrongly by students and then I make correction

R: Okay, what do you do when the majority of your students fail a test or assignment?

T4: When the majority fails the tests, I interpret that the lesson is not understood; I can make revision to that particular content and make correction of the tests

R: And how do you handle and organize assessment marks?

T4: Assessments is handled in special file in our department

R: Last question in this part is, do you use a computer to handle students' marks? And which computer programmes do you use?

T4: No, I am not use computer to handle students' marks; we file in department for handle students marks

R: Let move to the last section based on challenges faced in practices continuous assessment. What problems have you encountered in conducting continuous assessment?

T4 : Challenges in conducting continuous assessment is the number of students is large which contribute to fail to finish on time that is first, aa second ; lack of chemicals and apparatus in the labs during the practical as a result sometimes teacher decide to use theoretical sessions.

R: Okay, have you done to address the challenges you faced in continuous assessment?

T4: Yes, the solution is more science teachers be employed , and availability of chemicals in the labs so as students can get opportunity to do more practical otherwise we can't improve teaching and learning as well as continuous assessment

R: And do you think Tanzanian teachers need training in conducting continuous assessment? Explain

T4: Yes, because things keep changing, so it is better to have training so that to copy with changes.

R: And if yes, what should this training focus on?

T4: Training should base on practical work, handling of laboratory, how to design practical and how to conduct practical

R: Okay, in your school, what resources do you use in continuous assessment? Photocopier, chalkboard, computer?

T4: We use photocopier

R: What are the roles played by your HOD, your headmaster, in what you do in assessing students?

T4: The HOD and headmasters they ensure me all necessary materials are available for teaching and learning process

R: How can we in Tanzania improve the way we assess Learners?

T4: We can improve continuous assessment by make it to be more practical rather than be theoretical perspectives.

R: Last question, do you think the instructions given to teachers on how to conduct continuous assessment are clear and understandable?

T4: The instructions are not clear thus why the continuous assessment differ from one school to another.

R: Thank you teacher for your contributions

Appendix 4.5: Interview transcript for teacher (T5).

Teacher: T5

Date: 18.09.2012

Time: ± 60 min

Interviewee: T5

Interviewer: R (R =researcher)

Gender: Female

Level of qualification: Master's

Teaching experience: 4 years

Subject teach in science: Chemistry

R: Hallo, good morning teacher

T5. Morning

R: I am interesting to know about continuous assessment, from your own experience, what to you is continuous assessment?

T5: To me, continuous assessment is tasks given to students during the teaching and learning process

R: What can you say about continuous assessment with regard to teaching and learning process in Tanzania?

T5: I think it is good since it enhance the academic performance of students

R: Another question, what do you think advantages of continuous assessment?

T5: enhance students to study hard

R: What are the disadvantages of continuous assessment?

T5: If not well prepared results in to poor performance

R: Okay and how should formative and summative assessment is used?

T5: Both formative and summative assessment should be used to support learning process

R: Can you describe the way you teach?

T 5: Yes, I teach through discussions, lecturing, practical and demonstrations

R: And, what do you think about the quality of exams in Tanzania?

T5: The quality of education in Tanzania is good

R: Okay, Let me now move to another part based on how you practice the continuous assessment. In your opinion, why is continuous assessment important? Did you agree, explain.

T5: Yes, I agree that continuous assessment is important and enable students to study every day

R: How often do you assess your students? Daily, weekly, monthly or once per term?

T5: Yes, I assess my students weekly

R: What types of assessment tasks do you give to your students? For example, types of tests.

T5: I give my students home works, weekly tests, midterm tests, terminal exams as well as annual exams

R: And how often do you give each of the following tasks for assessment? Tests, homework, class assignments, projects, group tasks, practical tests, practical exercise, and quizzes.

T5: I give students twice per week

R: What factors do you consider when setting assessment tasks?

T5: I consider content coverage of the topics.

R: Okay, do you evaluate the cognitive demands of your tasks e.g. Tests?

T5: Yes

R: When you prepare a test do you always have a marking scheme or assessment rubric?

T5: Yes

R: Do you ask other colleagues to moderate your tests?

T5: No

R: Can you describe the way you mark students' work, tests, practical, and assignments?

T5: I mark through question wise

R: And then after you have given work, how long does it take for you to give feedback to the students?

T5: Okay, I provide the feedback after a week.

R: Can you describe the way you mark students' work

T5: I mark one question after another.

R: What do you do when giving feedback to students on a tests, homework, practical etc?

T5: I make correction

R: Okay, what do you do when the majority of your students fail a test or assignment?

T5: I make remedial.

R: And how do you handle and organize assessment marks?

T5: In Microsoft – excel programme

R: The last question in this part is, do you use a computer to handle students' marks? And which computer programmes do you use?

T5: Yes, I use Microsoft – excel programme

R: Let move to the last section based on challenges faced in practices continuous assessment. What problems have you encountered in conducting continuous assessment?

T5: A challenge in conducting continuous assessment is the numbers of students are in large.

R: Have you done to address the challenges you faced in continuous assessment?

T5: Yes, I think may be the solution is, the number of students should be manageable in classroom.

R: Do you think Tanzanian teachers need training in conducting continuous assessment? Explain

T5: No.

R Okay, in your school, what resources do you use in continuous assessment? Photocopier, chalkboard, computer?

T5: We use computer

R: What are the roles played by your HOD, your headmaster, in what you do in assessing students?

T5: They give plans and schedule for the assessments.

R: How can we in Tanzania improve the way we assess Learners?

T5: Projects should be a must to all candidates.

R: Last question, do you think the instructions given to teachers on how to conduct continuous assessment are clear and understandable?

T5: The instructions are not clear

R: Thank you teacher for your contribution

Appendix 4.6:

Interview transcript for teacher (T6).

Teacher: **T6**

Date: **19.09.2012**

Time: **± 60 min**

Interviewee: **T6**

Interviewer: **R (R =researcher)**

Gender: **male**

Level of qualification: **Degree**

Teaching experience: **Over 10 years**

Subject teach in science: **Physics**

R: Hallo, good morning teacher

T6. Morning

R: I am interesting to know about continuous assessment. From your own experience, what to you is continuous assessment?

T6: To me, continuous assessment is the ongoing tasks given to students during the teaching and learning process

R: What can you say about continuous assessment with regard to teaching and learning process in Tanzania?

T6: Is the ongoing tests, questions, and examinations to assess students progress.

R: Another question, what do you think advantages of continuous assessment?

T6: To evaluate whether the planned objectives reaches the intended goals. It also helps to find new ways of implementing goals

R: What are the disadvantages of continuous assessment?

T6: It hinders other activities to be implemented by wasting time for reviewing the previous ones

R: Okay and how should formative and summative assessment is used?

T6: Formative should be as continuality program in the teaching and learning process while and summative assessment should be at the end of the program

R: Can you describe the way you teach?

T6: Yes, I teach participatory and lecture methods. Through lecture approach you can manage to cover the curriculum contents, because is too large.

R: And, what do you think about the quality of exams in Tanzania?

T6: The quality of education in Tanzania measure students understanding according to theories and practical carried during their period study.

R: Okay, Let me now move to another part based on how you practice the continuous assessment. In your opinion, why is continuous assessment important? Did you agree, explain.

T6: Yes, I agree that continuous assessment is important and enable both teacher and students to monitor their achievements.

R: How often do you assess your students? Daily, weekly, monthly or once per term?

T6: Yes, I assess my students weekly

R: What types of assessment tasks do you give to your students? For example, types of tests.

T6: I give my students achievement tests

R: And how often do you give each of the following tasks for assessment? Tests, homework, class assignments, projects, group tasks, practical tests, practical exercise, and quizzes.

T6: I give students tests and homework every week, project once per term

R: What factors do you consider when setting assessment tasks?

T6: I consider content coverage of the topics, length of the tests, aim of the tests and time taken.

R: Okay, do you evaluate the cognitive demands of your tasks e.g. Tests?

T6: Yes

R: When you prepare a test do you always have a marking scheme or assessment rubric?

T6: Yes

R: Do you ask other colleagues to moderate your tests?

T6: Yes

R: Can you describe the way you mark students' work, tests, practical, and assignments?

T6: I prepare marking scheme before engaging in marking.

R: And then after you have given work, how long does it take for you to give feedback to the students?

T6: Okay, I give the feedback after a week.

R: Can you describe the way you mark students' work

T6: I mark question wise

R: What do you do when giving feedback to students on a tests, homework, practical etc?

T6: I make correction

R: Okay, what do you do when the majority of your students fail a test or assignment?

T6: I repeat the assignment, to find out causes that brought them students to fail and finally I find alternative ways to solve the problems.

R: And how do you handle and organize assessment marks?

T6: Microsoft – excel programme

R: The last question in this part is, do you use a computer to handle students' marks? And which computer programmes do you use?

T6: Yes, I use Microsoft – excel programme

R: Let move to the last section based on challenges faced in practices continuous assessment. What problems have you encountered in conducting continuous assessment?

T6: A challenge in conducting continuous assessment is the numbers of students are in large and inadequate of science teachers

R: Have you done to address the challenges you faced in continuous assessment?

T6: I think more science be employed

R: Do you think Tanzanian teachers need training in conducting continuous assessment? Explain

T6: Yes. They need training

R: If yes, what should this training focus on?

T6 Training should focus on how to prepare tests, practical and projects.

R Okay, in your school, what resources do you use in continuous assessment? Photocopier, chalkboard, computer?

T6: We use computer

R: What are the roles played by your HOD, your headmaster, in what you do in assessing students?

T6: They give plans and schedule which guide us for the assessments.

R: How can we in Tanzania improve the way we assess Learners?

T6: Should assess students competence

R: Last question, do you think the instructions given to teachers on how to conduct continuous assessment are clear and understandable?

T6: The instructions are not clear

R: Thank you teacher for your contributions

T6: Thank you too.

Appendix E: CONFIRMATION LETTER OF CANDIDATURE FOR THE DEGREE OF MASTER.

Faculty of Humanities: Education Campus

Room 208/9, Administration Block, 27 St. Andrews Road, Parktown**Tel**: +27 11 717-3021/18 · **Fax**: 0865533480 or +27 11 717-3219 E-mail: maropeng.maake@wits.ac.za

Ms Kibuna Mpapalika PERSON NUMBER 567171

P O Box 474

DaeresSalaam

United Republic of Tanzania

02 August 2012

Dear Ms. Mpapalika

CONFIRMATION OF CANDIDATURE FOR THE DEGREE OF MASTER OF EDUCATION BY COURSEWORK (FULL-TIME)

I am pleased to inform you that the Graduate Studies Committee in Education has approved

Your research proposal entitled:**"Tanzania science teachers' practices and challenges in continuous assessment."**

You have been admitted to candidature subject to minor corrections made to the satisfaction of your supervisor.

Please note that a copy of the readers' report has been given to your supervisor.

I confirm that **Dr. Elaosi Vhurumuku** has been appointed as your supervisor.

Your attention is drawn to the Senate's requirement that all higher degree candidates submit brief written reports on their progress to the Faculty Office once a year.

Please note that higher degree candidates are required to renew their registration in January each year. Please keep us informed of any changes of address during the year.

Yours sincerely

N Madikhetla

Ms. Nombulelo Madikhetla

Deputy Faculty Registrar

Faculty of Humanities: Education

cc Supervisor

Appendix F : Consent Form Teachers audio taping

Please fill and return the reply slip below and indicate your willingness to have your interview audio taped for my voluntary research project Tanzania science teachers' practices and challenges in continuous assessment…

Permission to be audio taped

My name: _____

I give/do not give (please delete as appropriate) my consent to have the interview recorded.

[ ] I know that I may withdraw from the study at any time and will not be advantaged or disadvantaged in any way.

[ ] I know that I can stop the audio taping of the interview at any time without repercussions.

[ ] I know that the tapes will be destroyed between 3-5 years after completion of the project.

Teacher Signature: _____ Date: _____

Contact person:

NAME: KIBUNA MPAPALIKA

ADDRESS WITS UNIVERSITY, MARANG CENTRE, SCIENCE EDUCATION

Cell number: (+27798133459)

Appendix G: LETTER TO THE DISTRICT EDUCATION OFFICER

The District Education Officer,

P.O.BOX. 72……

Kibaha, Tanzania.

30 June, 2012

Dear Sir / Madam

Subject: Permission to conduct a research

My name is Kibuna Mpapalika, a master student in the School of Education at the University of the Witwatersrand, Johannesburg-South Africa.

I am doing research on Tanzania Science teachers' practice and challenges in continuous assessment. A case study in Kibaha District.

My research will investigates the practice and challenges of Tanzania secondary school science teachers in implementing school based assessment (continuous assessment). Data will be collected through focus group interviews, classroom observation and questionnaires. Fifty (50) teachers and three schools from your district are expected to participate in this study.

The reason for choosing your district, first none of such research has been done and I hope that through this research I will add more knowledge to science teachers on how to implement and administer the continuous assessment or school based assessment.

I am intending to be on the research field by September, 2012

The research participants will not be advantaged or disadvantaged in any way. They will be reassured that they can withdraw their permission at any time during this project without any

penalty. There are no foreseeable risks in participating in this study. The participants will not be paid for this study.

The names of the research participants and identity of the Kibaha science teachers' secondary school will be kept confidential at all times and in all academic writing about the study. Your individual privacy will be maintained in all published and written data resulting from the study.

All research data will be destroyed between 3-5 years after completion of the project.

Please let me know if you require any further information.

I look forward to your response as soon as is convenient.

Yours sincerely,

Kibuna M. Mpapalika (+27798133459)

Email : mpapalika@gmail.com

Appendix H : **ETHICS CLEARNCE LETTER**

Wits School of Education

27 St Andrews Road, Parktown, Johannesburg, 2193 Private Bag 3, Wits 2050, South Africa
Tel: +27 11 717-3064 Fax: +27 11 717-3100 E-mail: enquiries@educ.wits.ac.za Website: www.wits.ac.za

Student Number:
567171

Protocol Number:
2012ECE192

Date: 14-Feb-2013

Dear Kibuna Mpapalika

Application for Ethics Clearance: Master of Education

Thank you very much for your ethics application. The Ethics Committee in Education of the Faculty of Humanities, acting on behalf of the Senate has considered your application for ethics clearance for your proposal entitled: **Science teachers' practices and challenges in continuous assessment**

The committee recently met and I am pleased to inform you that clearance was granted. However, there were a few small issues which the committee would appreciate you attending too before embarking on your research.

The following comments were made:

- Please adjust question 4 of Part A to read: What subject(s) do you teach... This adjustment needs to be made in both the questionnaire and the Interview Schedule.

Please use the above protocol number in all correspondence to the relevant research parties (schools, parents, learners etc.) and include it in your research report or project on the title page.

The Protocol Number above should be submitted to the Graduate Studies in Education Committee upon submission of your final research report.

All the best with your research project.

Yours sincerely

MMabeta

Matsie Mabeta
Wits School of Education

011 717 3416
Cc Supervisor: Prof. E. Vhurumuku