UNIVERSITY OF CAPE COAST

PERCEPTION OF AUTHENTIC ASSESSMENT AND ITS PRACTICES

AMONG TEACHERS IN PUBLIC SENIOR HIGH SCHOOLS IN CAPE

COAST METROPOLIS

STELLA NACKLINA ATTOM

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AMONG TEACHERS IN PUBLIC SENIOR HIGH SCHOOLS IN CAPE

COAST METROPOLIS

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and

that no part of it has been presented for another degree in this university or

elsewhere.

Candidate's Signature…………………………………..Date…………………..

Name:

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were

supervised in accordance with the guidelines on supervision of thesis laid

down by the University of Cape Coast.

Principal Supervisor's Signature…………………...Date…………………..

Name:

Co-Supervisor's Signature…………………………….Date………………….

Name:

ABSTRACT

The study aimed at investigating the perception of public Senior High School teachers of authentic assessment. It also found out the extent to which public Senior High School teachers practice authentic assessment in their assessment procedure. The stratified sampling procedure was adopted to group Senior High Schools into categories A, B and C. Simple random sampling was used to select three schools from category "A" and two schools from category "B" but the two schools in category "C" were purposively sampled. In all, seven schools were used. Proportional stratified random sampling was used to obtain the sample size for each school. Then convenience sample was used to select two hundred and twenty-six participants for the study. Four research questions and two hypotheses guided the study. An 85-item questionnaire was used for data collection. The reliability coefficient of the questionnaire was 0.86. The study showed that to a great extent, teachers have positive perception of authentic assessment. About 70% of the teachers indicated that they give their students assessment tasks that involve social processes equivalent to those in real life situation. Also, teachers reported that they practice authentic assessment by asking students to create, organize ideas with a purpose and demonstrate their ability to organize ideas effectively. Again, the findings indicated a significant difference within categories B and C schools in terms of authentic assessment practices but there was no significant difference within categories A and B schools and categories A and C schools. Heads of Senior High Schools should organize workshops, seminars and other activities for teachers on authentic assessment.

KEY WORDS

Authentic Assessment

Performance-based assessment

Alternative assessment

Practices

Teachers

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DEDICATION

To my late parents

Mr Alex Y. Attom and Madam Dinah Abaidoo

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CHAPTER ONE

INTRODUCTION

The study was carried out to ascertain the perception of Senior High School teachers on authentic assessment and the extent to which they practice authentic assessment. Current assessment procedures do not assess the full range of essential educational outcomes. Sometimes teachers have difficulty using students' assessment results to make informed decisions about students. Using authentic assessment offers a more holistic way of assessing students. Authentic assessment moves beyond rote learning and memorization which are the core elements of traditional assessment approach.

A number of researches have been conducted on the use of authentic assessment in higher education, authentic assessment strategies and tools used to improve students' learning. However, the results of the study would help stakeholders to gain insight into how teachers perceive authentic assessment and also be informed about the kinds of authentic assessment teachers use to assess their students. Again, the results of the study would enable policy makers encourage educators to use authentic assessment alongside the traditional assessment to ensure a holistic development of students in order to fit well into the society

Background to the Study

Assessment can be seen as an umbrella term which includes the use of various strategies and methods to determine the extent to which students are

achieving the predetermined learning objectives and outcomes of a lesson (Mussawy, 2009). There are different types of assessment which can be used to test students' knowledge and see their current levels in specific subjects. Two major types of assessment widely used are traditional types of assessment and performance-based assessment (Birenaum, & Feldman,1998). Birenaum, and Feldman, (1998) argue that traditional types of assessment tools are generally knowledge-based and include conventional types of tests such as multiple-choice questions, short answer essays or constructed responses and standardized tests whereas in performance based assessments, students are required to perform a task rather than select from options provided and students are assessed according to their performance outcomes and the extent to which those outcomes are in relation to the rubrics or feedback tools. Authentic assessment is performance-based and requires students to exhibit the extent of their learning through a demonstration of mastery (Poikela, 2004).

Since the early1990s, teacher educators, theorists and researchers have flocked to support authentic assessment as a more valid and productive approach towards student evaluation. According to Gulikers, Bastiaens, and Kirschner (2004), authentic assessment (which is an aspect of performance assessment) in a real sense, is about making visible (produce evidence of learning in some way) and measurable (to some appropriate standard) a performance that is a valid (i.e. relevant) indicator that the identified elements of the curriculum have been learned in an integrated manner for the conditions in which they are ultimately intended.

Authentic assessment is an evaluation process that involves multiple forms of performance measurement reflecting the student's learning, achievement, motivation, and attitudes on instructionally-relevant activities (Mussawy, 2009). However, in recent times, authentic assessment has been discussed in the context of broadening assessment practices across all disciplines at all levels of education and aligning them more closely with expected learning outcomes (Gulikers, Bastiaens, & Kirschner, 2004).

Practicing authentic assessment in senior high schools will help stimulate teachers to develop an approach that rewards genuine effort and in depth learning rather than measuring luck (Gulikers, Bastiaens, & Kirschner, 2004). The question remains whether students are taught so that they can excel on a test or they are taught to construct meaning that will be sustained in the long-term. The extent to which authentic assessment approaches help students to apply concepts outside the school rather than the idea to teach students to the test can never be overlooked (Gulikers, Bastiaens, & Kirschner, 2004).

According to Marzano, Pickering, & Mctighe (1993), authentic assessment is a subset of alternative evaluation processes, and is based on the assumption that there is a much wider spectrum of student performance that can be displayed than that which is limited by short-answer and standardized tests. This wider spectrum should include real-life learning situations and meaningful problems of a complex nature not solved with simple answers selected from a menu of choices (Marzano, Pickering, & Mctighe, 1993). Using authentic assessment usually springs from the idea that graduates should be proficient at performing the tasks they encounter when they graduate;

therefore, their assessment should require them to perform meaningful tasks that replicate real world challenges (Marzano, Pickering, & Mctighe, 1993). The importance of changing assessment practices so they mirror the learning process becomes clearer when one realizes that students learn what they know they will be tested on (Marzano, Pickering, & Mctighe, 1993). Doyle (as cited in Marzano, Pickering, and McTighe, 1993) found out that American schools soon discovered that all things learned are not equal: "you are tested on some and not on others" (p.11). Doyle (as cited in Marzano, Pickering, and McTighe, 1993) observed that most students in recent times choose to ignore those things on which they are not tested. And teachers also tend to consciously or unconsciously focus their instruction on the learning that are prescribed and tested by the school, district, or nation.

Marzano, Pickering and McTighe (1993) again argue that conventional selected-response test formats (e.g. multiple choice, true/false, matching) are quite narrow in their focus. They further argue that these test formats provide only a snapshot or a "one moment in time" picture of learning. Although such sampling may have certain uses, it is generally incapable of revealing in any comprehensive way what students know and can do. Moreover, the conditions of such tests are highly controlled (Marzano, Pickering & McTighe, 1993). They further assert that students complete the assessment tasks within inflexible time limits and have restricted access to resources. These kinds of tests also sacrifice authenticity, since they differ markedly from the way in which people apply knowledge in the world outside of school.

A basis for the increased role of authentic assessment for classroom use is the belief that education is not simply a matter of memorization but must be informed by critical thought and applied knowledge. Campbell (2000) terms this 'authentic education', which is based on performance and reality. Assessment designed to measure such 'valid' knowledge can be termed "authentic" (Campbell, 2000). A study conducted by Winograd and Perkins (1997) in the United States of America on the need for authentic assessment raised concerns regarding traditional methods of assessment. According to them the story told from the perspective of a first grade teacher and her students showed how students begin to question their self-worth and competence when they find out that only few in their class "did a good test". Fortunately the students' teacher, like most good teachers understood the strengths of her students and the need to feel good about themselves as leaners (Winograd & Perkins, 1997). Again, they assert that the classroom scenario is not unique and that many teachers are actually aware that tests do not tell everything about students. They argue that authentic assessment is a more constructive assessment which examines specific techniques and strategies that teachers can use in their classrooms and relevant throughout the grades and across the curriculum.

Crafton (as cited in Winograd and Perkins, 1997) also postulates that in authentic assessment there is a personal intent, a reason to engage, and a genuine audience beyond the teacher. He further argues that the real-life experiences remind us "that school is not for getting ready to do the real stuff of life sometime in the near future, it is for doing real things for real audience

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and for ourselves right now" (p.13). Authentic assessment presents teachers with a standardized set of performance assessments for each stage. Each assessment task is accompanied by a set of scoring rubrics to evaluate student work. It is hoped that by utilizing standard tasks and scoring procedures, teachers at every stage/ level in the Senior High School can move students towards the goal of creating responsible citizens (Todorov & Brousseau, 1998).

Todorov and Brousseau (1998), also argue that "disconnected lessons without a central theme or focus, without opportunities for in-depth learning, lessons that do not require higher-order thinking, or that are not related to the child's personal world of experience are doomed. They are confusing to students, irrelevant, and easily forgotten" (p.18), hence the need for authentic assessment. According to Mussawy (2009), simply testing an isolated skill or a retained fact does not effectively measure a student's capabilities. To accurately evaluate what a student has learned, an assessment method must examine his or her collective abilities. As Birenbaum (1996) asserts, the role of the instructor in authentic assessment corresponds to the constructivist approach to education, viewing the instructor as a facilitator and mentor who provides opportunities for students to construct their own meaning. In the constructivist approach, learning is considered to be a process, that students (learners) create their own meaning of a lesson or concept and also rely on their prior knowledge, skills and ability to critically analyse a context and resolve problems (Black & William, 1998).

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Assessment in Ghana is dominated by traditional testing from the classroom to the national level. Analysis has been largely uncritical, however, and the emphasis on authentic outcomes poses problems as well as solutions (Eshun, Kankan, Bordoh, Bassaw & Korang, 2014). They further argue that there are not much formal authentic assessment training programmes for teachers in the Ghana educational context. According to Eshun, Kankan, Bordoh, Bassaw & Korang (2014) an outcome-based approach requires that teachers test in authentic ways what is considered to be most important in terms of knowledge, skill, values, and attitudes. Thus, if critical thinking, problem solving, positive attitudes and values, analytical skills and civic competence are highly valued, and then students should be able to demonstrate mastery of these through worthwhile activities which meet the demands and expectations of the society. Hence the need to employ authentic assessment in our various classrooms depends greatly how teachers perceive authentic assessment (Eshun, Kankan, Bordoh, Bassaw & Korang, 2014).

Statement of the Problem

According to Wiggins, and McTighe (2007), traditional assessment has placed emphasis on efficient tasks and tests that are perceived as demonstrating the student's educational abilities. It is believed that authentic assessment is becoming increasingly popular, as a perception and has grown to the extent that there is the need for more holistic approaches to evaluating students. Winograd and Perkins (1997) assert that, authentic assessment moves beyond learning by rote and memorization of traditional methods and allows students to construct responses.

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Flexer, Marison & Mayfield (1994) also state that under the conditions of high-stakes accountability pressure, it has been demonstrated that teachers align instruction with the content of basic skills tests, often ignoring science and social studies and even untested objectives in reading and mathematics. Furthermore, instruction on tested skills comes to resemble closely the format of multiple-choice tests, with students learning the right answers rather than generating their own solutions (Flexer, Marison & Mayfield, 1994). Such measurement driven instruction has been harmful to learning as evidenced by the decline in higher order thinking skills on the National Assessment of Educational Progress in the United States during the 1990s.

Another common complaint about traditional assessments is that they show cultural biases which make them unfair for minority students thus placing the assessment within a real world context is seen as being a way around this problem (Fusco & Barton, 2001). Callison (1998) also argues that assessment procedures do not assess the full range of essential student outcomes, and teachers have difficulty using the information gained for instructional planning. He further argues that multiple-choice examinations, for example, have emphasized the assessment of discrete skills and do not contain authentic representations of classroom activities, social interactions, use of multiple resources, or real-life situations. In spite of these criticisms schools are still emphasizing on the use of traditional assessment as the sole assessment practice used to assess students.

Moreover, at the Senior High School level, the traditional assessment has often been criticized for focusing on the disconnectedness between the

limited range of skills taught in the classroom and what the student will face in the 'real world' (Prestidge & Williams-Glaser, 2000). Poikela (2004) argues that in traditional assessment, reflective and social knowing skills are weakly assessed, and this can and should be addressed through the use of more authentic assessment.

However, little is known as to how Senior High School teachers in the Cape Coast Metropolis perceive and practice authentic assessment and the authentic assessment strategies they employ to assess student learning outcomes. This research, therefore, seeks to find out how teachers in Senior High schools in the Cape Coast Metropolis perceive and practice authentic assessment.

Purpose of the Study

The purpose of the study is to investigate the perception of public Senior High School teachers of authentic assessment. It is also to find out the extent to which public Senior High School teachers apply authentic assessment in their assessment procedures. Specifically, the purpose of the study is to:

1. Investigate the perceptions of authentic assessment by public Senior High School teachers in Cape Coast Metropolis.

2. Investigate how Senior High School teachers in Cape Coast Metropolis practice authentic assessment.

3. Investigate how Senior High School teachers in Cape Coast Metropolis use authentic assessment result.

4.   Find out the kinds of authentic assessment tasks / strategies Senior High School teachers in Cape Coast Metropolis use to assess their students' learning outcomes.

5.   Investigate the challenges Senior High School teachers in Cape Coast Metropolis encounter in the use of authentic assessment in their various subjects.

Research Questions

The following research questions were posed to guide the study:

1.   What are the perceptions of authentic assessment by public Senior High Schools teachers in Cape Coast Metropolis?

2.   How do Senior High School teachers in Cape Coast Metropolis practice authentic assessment?

3.   How do Senior High School teachers in Cape Coast Metropolis use authentic assessment results?

4.   What kinds of authentic assessment tasks/strategies do Senior High School teachers in Cape Coast Metropolis use to assess their students' learning outcomes?

5.   What challenges do Senior High School teachers in Cape Coast Metropolis have in the use of authentic assessment in their various subjects?

Hypotheses

1. Ho: There is no significant difference in the use of authentic assessment within the major programs (Science, General Art and Business) studied in the Senior High School.

2. Ho: There is no significant difference in the practice of authentic assessment within the categories A, B and C Senior High Schools.

Significance of the Study

The results of the study would help enlighten the teachers on their knowledge of assessment in general and authentic assessment in particular.

The findings of this study would help curriculum developers, educators and teachers to understand the impact of teacher's perceptions of authentic assessments on instructional practices, student's performance and the goal of education.

Specifically, the findings of this study would inform teachers about the value and impact of authentic assessments on their instruction. The results of this study would provide insight for curriculum developers, educators and teachers regarding the challenges impeding the effective use of authentic assessments for appropriate intervention.

The findings of this study would also inform educational researchers, policy makers, test experts and examination bodies the value and impact of authentic assessments on students' learning and the need to integrate more authentic assessment practices into the curriculum.

Finally, this study would be a significant addition to authentic assessment literature in the country.

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Delimitation

The study was delimited to only the second cycle institutions and no other levels of education. Again, it was delimited to only public Senior High Schools in the Cape Coast Metropolis. Content wise the study was delimited to authentic assessment and no other forms of assessment. It was also delimited to perceptions and practices, challenges of authentic assessment and authentic assessment tasks/tools.

Limitations

The major limitation of the study was the unenthusiastic attitude of teachers toward research work and especially completing of questionnaires. This resulted in 211 of the questionnaires being retrieved which represented 93.36% of the 226 questionnaire distributed.

In the ideal situation, a nationwide study is required. This would have given much confidence to any generalizations made. The time for the study and the resources available, however, made this impracticable. Hence, the selection of the seven government assisted Senior High Schools in the Cape Coast Metropolis of Ghana.

Not all the departments in the SHS were included in the study. This is because the departments are so many and that time and resources available would have been a hindrance to the inclusion of all of them in the study. In view of this, General Arts, Science, and Business were considered for the study. The fewer number of departments at the Senior High Schools that were used for the study might affect generalization to the whole Senior High School teachers.

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Definition of Key Terms

For the purpose of this study, certain terms used are explained below:

Assessment: A process of gathering evidence of what a student can do, and provide feedback on a student's learning to encourage further development.

Alternative assessment: It is a form of student performance grading that allows for a more holistic approach to student assessment.

Authentic assessment: It is the assessment that occurs continually in the context of a meaningful learning environment and reflects actual and worthwhile learning experience that can be documented through observation, anecdotal records, journals, logs, work samples, conferences, portfolios, writing samples, discussions, experiments, presentations, exhibits, projects, etc.

Performance based assessment: It is also known as alternative assessment or authentic assessment that requires students to perform a task rather than select an answer from a ready-made list. In other words, performance assessment measures students skills based on authentic task such as activities, exercises, or problems that require students to show what they can do.

Continuum: It is a continuous sequence in which adjacent element are not perceptibly different from each other, but the extremes are quite distinct.

Perception: Views or opinions held by an individual resulting from experience and external factors acting on the individual.

Organization of the Study

The study is organized into five chapters. Chapter one consists of an introduction to the study; the background of the study, statement of the problem, the purpose of the study and objectives of the study. In addition, the research questions, significance of the study, delimitation, limitations, definition of terms as pertains to the study as well as organization of the study, are described. Chapter two dealt with the review of related literature to the study from documents published and unpublished, including books, journals, newspapers, the internet and other materials that were relevant to the study.

Chapter three dealt with the research methods used in the study. Content of this chapter included the research design, study area, population, sampling procedure, data collection instruments, data collection procedure as well as the data processing and analysis plan. Chapter four focused on the results of the study and discussions. Chapter five dealt with the summary, conclusions drawn from the study, recommendations and suggestions for further research studies.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Numerous researches indicate that assessment is a critical component of effective teaching and learning that can propel the realization of better learner outcomes by enhancing teachers' teaching and students' learning (Black & Wiliam, 1998). Nonetheless, this all important aspect in instruction has not always gained this height of recognition and regard (Black & Wiliam, 1998). The demand for more challenging content to more diverse learners suggest a need for teachers to become more sophisticated in their understanding of the effects of context and learner variability on teaching and learning (Darling-Hammond, & Snyder, 2000). Instead of implementing set routines, teachers need to become ever more skillful in their ability to evaluate teaching situations and develop teaching responses that can be effective under different circumstances (Darling-Hammond & Snyder, 2000).

This chapter consists of the conceptual framework, theoretical framework and empirical framework. The conceptual framework also covers the concept of performance-based assessment, concept of authentic assessment, the importance of authentic assessment, forms and characteristics of authentic assessment, authentic assessment tools and challenges of using authentic assessment. The theoretical framework deals with the constructivist learning theory and two models, namely, the dimensions of learning model

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and a five-dimensional framework for authentic assessment. Empirically, the following topics were also reviewed: teachers' perceptions and assessment practices, use of authentic assessment result, authentic assessment tools and challenges of using authentic assessment.

Conceptual framework

Concept of performance-based assessment

Performance assessment is an assessment which requires students to demonstrate that they have mastered specific skills and competencies by performing or producing something (Haertel, 1999). Carefully crafted performance assessments that measure complex thinking and reasoning skills can serve as exemplars of assessments that stimulate and enrich learning rather than just serve as indicators of learning (Black & William, 1998). According to them, performance assessments are needed to assess the types of thinking and reasoning skills that are valued by educators, and cannot be assessed by other item formats such as multiple-choice items. Advocates of performance assessment call for assessments of the following kind: designing and carrying out experiments; writing essays which require students to rethink, to integrate, or to apply information; working with other students to accomplish tasks; demonstrating proficiency in using a piece of equipment or a technique; building models; developing, interpreting, and using maps; making collections; writing term papers, critiques, poems, or short stories; giving speeches; playing musical instruments; participating in oral examinations; developing portfolios; developing athletic skills or routines (Wiggins, 1990). According to him, advocates of performance assessments

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maintain that every task must have performance criteria for at least two reasons: (1) the criteria define for students and others the type of behavior or attributes of a product which are expected, and (2) a well-defined scoring system allows the teacher, the students, and others to evaluate a performance or product as objectively as possible. Weber (1999) also asserts that if performance criteria are well defined, another person acting independently will award a student essentially the same score. Furthermore, well-written performance criteria will allow the teacher to be consistent in scoring over time.

Stiggins (1994), also argue that if a teacher fails to have a clear sense of the full dimensions of performance, ranging from poor or unacceptable to exemplary, he or she will not be able to teach students to perform at the highest levels or help students to evaluate their own performance. In developing performance criteria, Stiggins again, maintains that one must both define the attribute(s) being evaluated and also develop a performance continuum. For example, one attribute in the evaluation of writing might be writing mechanics, defined as the extent to which the student correctly uses proper grammar, punctuation, and spelling. As for the performance dimension, it can range from high quality; well-organized, good transitions with few errors to low quality; so many errors that the paper is difficult to read and understand (Stiggins 1994).

Herman, Aschbacher, and Winters (1992) suggest that educators need to ask themselves five questions as they identify what is to be learned or

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practiced by completing a performance task. Their questions, with examples, follow:

1. What important cognitive skills or attributes do I want my students to develop? (e.g., to communicate effectively in writing; to analyze issues using primary source and reference materials; to use algebra to solve everyday problems).

2. What social and affective skills or attributes do I want my students to develop? (e.g., to work independently, to work cooperatively with others, to have confidence in their abilities, be conscientious).

3. What metacognitive skills do I want my students to develop? (to reflect on the writing process they use; to evaluate the effectiveness of their research strategies, to review their progress over time).

4. What types of problems do I want them to be able to solve? (to undertake research, to understand the types of practical problems that geometry will help them solve, to solve problems which have no single, correct answer)

5. What concepts and principles do I want my students to be able to apply?

(e.g. to understand cause-and-effect relationships, to apply principles of ecology and conservation in everyday lives). Haertel (1999) again argue that performance assessments need to be appraised with regard to the quality and comprehensiveness of the content and processes being assessed and with regard to potential issues of bias in task content, language, and context.

According to Bekoe, Eshun and Bordoh (as cited in Eshun, Bordoh, Bassaw & Mensah, 2014) knowledge is constructed during the learning process and

that a student discovers knowledge for him/herself, rather than receiving knowledge, and this inspires the notion of performance-based assessment.

Similar to performance assessment is the concept of authentic assessment. Meyer (1992) notes that performance and authentic assessments are not the same and that a performance is "authentic" to the extent it is based on challenging and engaging tasks which resemble the context in which adults do their work. In practical terms, this means that an authentic task or assessment is one in which students are allowed adequate time to plan, to complete the work, to self-assess, to revise, and to consult with others. Meyer (1992) also contends that authentic assessments must be judged by the same kinds of criteria (standards) which are used to judge adult performance on similar tasks.

Concept of authentic assessment

Assessment is authentic when it measures products or performances that "have meaning or value beyond success in school" (Newman, Brandt & Wiggins, 1998, p.19). According to Newman et al, assessments that ask questions and poses problems that have "real world" meaning to students meet one criterion for being authentic intellectual work, but there are two others related to disciplined inquiry that are unrelated to the realism of the assessment tasks.

Wiggins (1989) was also an early proponent for the use of the term authentic to describe assessment with real-world application. According to him, "Authentic' refers to the situational or contextual realism of the proposed tasks" (Wiggins, 1998, p.20). Terwilliger (1998) expressed concerns with

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Wiggins and others use of the term, viewing the label of authentic as a veiled criticism of traditional assessment approaches as somehow less authentic or inauthentic. Wiggins position is essentially that traditional assessment is not inauthentic, it is simply less direct and, probably, less meaningful to students. Wiggins (1993) argues that traditional assessment is not faithful to the domains of performances and contexts that are most important for higher order thinking and learning. As he used the term, authenticity is a key to fidelity.

Gulikers, Bastiaens, and Kirschner (2004) define authentic assessment as "an assessment requiring students to use the same competencies, or combinations of knowledge, skills, and attitudes that they need to apply in the criterion situation in professional life". (p. 69). Khaira and Yambo (2005) also argue that authentic assessments should resemble meaningful performances in real world contexts and should involve real life tasks with multiple solutions for the student.

According to Khaira and Yambo (2005), research has shown that there are at least a dozen books and hundreds of journal articles on authentic assessment as an approach. They further explain that some of these works, even the books that use authentic assessment in their titles, use the term without offering a direct definition, but most do, at least, offer a set of criteria that amount to a definition. A review of those publications reveals a wide range of descriptions for the term, some of which overlap with other classroom assessment terms, such as performance-based assessment and formative assessment (Khaira & Yambo, 2005). Terwilliger (1998) again assert that in education, it is not uncommon for best practices or "hot" or

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innovative topics or methods to suffer from a confusion of understanding and a lack of consistent use of terms or definitions. The conceptual overlap between performance assessment, formative assessment and authentic assessment clouds the waters if one wishes to provide objective criteria (or, at least, criteria approaching objectivity) for judging the authenticity of an assessment (Terwilliger, 1998).

It is widely acknowledged that in order to meet the goals of education, a constructive alignment between instruction, learning and assessment (ILA) is necessary (Biggs, 1996). Current educational goals, especially in Europe, focus on the development of competent students and future employees (Dochy, & McDowell 2003). The ILA-practices that characterize these goals are: Instruction that focuses on learning and competence development; Learning based on reflective-active knowledge construction; and Assessment that is contextualized, interpretative and performance-based (Birenbaum, 2003). The need to contextualize assessment in interesting, real-life and authentic tasks is described as one of the crucial elements of alternative, or competency-based assessment that suits current educational goals (Birenbaum & Dochy, 1996). Dochy, & McDowell (2003) describes the assessment of the application of knowledge to actual, real-life (authentic) cases as the core goal of alternative assessments. Gielen, Dochy and Dierick (2003) even argue that authenticity of the assessment tasks is an imperative condition to achieve the expert level of problem solving. Moreover, increasing the authenticity of an assessment is expected, and experienced by students, to have a positive

influence on student learning and motivation (Herrington & Herrington, 1998; Sambell, McDowell, & Brown, 1997).

According to Winograd and Perkins (1997), authentic assessment is assessment that occurs continually in the context of a meaningful learning environment and reflects actual and worthwhile learning experiences that can be documented through observation, anecdotal records, work samples, journals, logs, conferences, portfolio, writing, discussions, experiments, presentations, exhibits, projects, and other methods. Authentic assessment may include individual as well as group tasks. The emphasis is on self-reflection, understanding and growth rather than on response that are based on the recall of isolated facts (Winograd & Perkins, 1997).

In practical terms authentic assessment or task is one in which students are allowed adequate time to plan, to complete the work, to self-assess, to revise, and to consult with others (Meyer, 1992). Mayer also contends that authentic assessment must be judged by the same kinds of criteria (standards) which are used to judge adult performance on similar tasks.

Wiggins (1990) suggest that three factors determine the authenticity of an assessment: the task, the context and the evaluation criteria. An authentic task is one which requires the student to use knowledge or skills to produce a product or complete a performance (Wiggins, 1990). Based on this definition, memorizing a formula would not be an authentic task; however, using the formula to solve a practical problem would be (Wiggins, 1990).

As for context Wiggins (1990), suggests that there be as much realism as is possible. He maintains that the settings (including the time allowed to

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complete the task) should mimic or duplicate the context faced by professionals, citizens, and consumers. According to Wiggins (1990), an examination in which the student has almost no prior knowledge of what will be asked, little time to complete the activity, and no opportunity to reflect or consult appropriate resources would not be authentic. Miller and Crocker (2005) also argue that test makers in multiple corners are creating more complex assessment, one that, if tied more closely to curriculum and instruction, could paint a clearer picture of student learning. He further states that they are building these assessments to measure the twenty-first-century skills which are urgently needed aiming to gauge a child's readiness for the real challenges that waits. If tests like these succeed, they could not only provide better information about students' readiness for real life but also give educators incentives to do what they want to do anyway: teach students in engaging ways to be well-rounded people and lifelong learners, not drill the life out of school with dry test preparation (Miller & Crocker, 2005).

Characteristics of authentic assessment

In research and other papers pertaining to authentic assessment, several authors have articulated various characteristics of this approach (Gulikers, Bastiaens & Kirschner, 2004, Hildebrand, 2005; Khaira & Yambo, 2005; Poikela, 2004; Smith & Koshy, 2005; Perkins & Wajrak, 2005)

According to consensus across this recent literature, authentic tasks:

1. Are similar to the real work done in professional contexts and highlights situational and contextual knowledge including the acquisition of relevant professional attitudes and competencies.

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2. Are performance-based and require students to demonstrate mastery of professional practices. The closer the tasks are to real practice, the greater the degree of authenticity.

3. Reflect clear alignment between desired learning outcomes, curriculum content, and future career-based knowledge.

4. Integrate required workplace skills with university academic requirements.

5. Emphasise assessment for learning purposes rather than just for grading, and incorporates social, cognitive, and reflective processes of learning.

6. Are fair and free from bias so they do not advantage or disadvantage any groups of students.

7. Are motivating, enjoyable, sustain interest, and are challenging, but achievable.

8. Are based on criteria that have been developed with, or negotiated with students to ensure they understand the nature of the task and what constitutes quality in terms of the outcome.

9. Are focused in ways that ensure there is neither too little nor too much assessment.

10. Achieve an appropriate balance between tasks that are too complex and too simple.

11. Often incorporates self, peer, and client assessment in conjunction with academic teacher assessment.

12. Ensure that students have opportunities to develop critical thinking and problem solving skills needed in professional situations, as well as the cognitive and performance skills relating to graduate attributes.

13. Provide clear evidence that students have achieved the desired learning outcomes.

14. Require timely feedback relating to criteria that students can act upon

15. Are quite often interdisciplinary because that reflects many real world contexts.

Khaira and Yambo (2005) also argue that 'authentic assessments should resemble meaningful performances in real world contexts' and should 'involve real life tasks with multiple solutions for the students" (p. 18).

According to Mueller (2006), another way that authentic assessment is commonly distinguished from traditional assessment is in terms of their defining attributes. Traditional assessments as well as authentic assessments vary considerably in the forms they take. Typically, along the continuums of attributes listed below, traditional assessments fall more towards the left end of each continuum and authentic assessments fall more towards the right end.

 Traditional -- Authentic

Selecting a Response -------------------------------- Performing a Task

Contrived ---Real-life

Recall/Recognition ----------------------------------Construction/Application

Teacher-structured ----------------------------------Student-structured

Indirect Evidence -----------------------------------Direct Evidence

Selecting a Response to Performing a Task:

On traditional assessments, Mueller (2006) contends that students are typically given several choices (e.g., a,b,c or d; true or false; which of these match with those) and are asked to select the right answer. In contrast, authentic assessments ask students to demonstrate understanding by performing a more complex task usually representative of more meaningful application (Mueller, 2006).

Contrived to Real-life:

Mueller (2006) further states that it is not very often in life outside of school that students are asked to select from alternatives to indicate their proficiency at something. He again argues that tests offer these contrived means of assessment to increase the number of times students can be asked to demonstrate proficiency in a short period of time. More commonly in life, as in authentic assessments, students are asked to demonstrate proficiency by doing something (Mueller, 2006).

Recall/Recognition of Knowledge to Construction/Application of Knowledge:

According to Mueller (2006), well-designed traditional assessments (i.e., tests and quizzes) can effectively determine whether or not students have acquired a body of knowledge. Thus, as mentioned above, tests can serve as a nice complement to authentic assessments in a teacher's assessment portfolio (Mueller, 2006). He further states that students are often asked to recall or recognize facts and ideas and propositions in life, so tests are somewhat authentic in that sense. However, the demonstration of recall and recognition on tests is typically much less revealing about what students really know and can do than when they are asked to construct a product or performance out of

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facts, ideas and propositions (Mueller, 2006). Mueller again postulates that authentic assessments often ask students to analyze, synthesize and apply what they have learned in a substantial manner, and students create new meaning in the process as well.

Teacher-structured to Student-structured:

Again, Mueller (2006) states that when completing a traditional assessment, what a student can and will demonstrate has been carefully structured by the person(s) who developed the test thus a student's attention will understandably be focused on and limited to what is on the test. In contrast, authentic assessments allow more student choice and construction in determining what is presented as evidence of proficiency (Mueller, 2006). He further contends that even when students cannot choose their own topics or formats, there are usually multiple acceptable routes towards constructing a product or performance and that more student-structured task have strengths and weaknesses that must be considered when choosing and designing an assessment.

Indirect Evidence to Direct Evidence:

Mueller (2006) argues that even if a multiple-choice question asks a student to analyze or apply facts to a new situation rather than just recall the facts, and the student selects the correct answer, what does the teacher know about that student? Did that student get lucky and pick the right answer? What thinking led the student to pick that answer? He further states that at best, teachers can make some inferences about what that student might know and might be able to do with that knowledge but the evidence is very indirect,

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particularly for claims of meaningful application in complex, real-world situations. Authentic assessments, on the other hand, offer more direct evidence of application and construction of knowledge (Mueller, 2006). According to Mueller (2006), student can effectively be asked to critique the arguments someone else has presented (an important skill often required in the real world), thus asking a student to write a critique should provide more direct evidence of that skill than asking the student a series of multiple-choice, analytical questions about a passage, although both assessments may be useful.

The importance of authentic assessment

The two most important reasons for using authentic assessments are their construct validity and their impact on student learning, also called consequential validity (Gielen, Dochy & Dierick, 2003). Construct validity is the appropriateness of inferences made on the basis of observations or measurement (often test scores), specifically whether a test measures that intended construct adequately (Messick, 1994). Again, Messick posits that with respect to competency assessment tasks must appropriately reflect the competency that needs to be assessed, that the content of an assessment involves authentic tasks that represent real-life problems of the knowledge domain assessed, and that the thinking processes that experts use to solve the problem in real life are also required by the assessment task (Gielen et al., 2003).

Based upon these criteria, authentic assessments are expected to have higher construct validity for measuring competencies than objective or traditional tests. Messick (1994) argues that construct underrepresentation is one of the major threats to construct validation, which is countered by increasing the authenticity of the assessment. Authenticity, he argues, deals with not leaving anything out of the assessment of a certain construct, leading to minimal construct underrepresentation.

Consequential validity of an assessment describes the intended and unintended effects of assessment on instruction or teaching and student learning (Dochy & McDowell, 1998). The expected positive influence of authentic assessment on student learning is twofold (Gielen, Dochy, & Dierick, 2003). First, it is expected to stimulate the development of professional competencies, and second it is likely to increases students' motivation to learn through the fact that students experience authentic assessments as more interesting and meaningful, because they realize the relevancy and usefulness of it for their future lives.

Forms of authentic assessment

If assessment is authentic, ongoing, and integrated with classroom instruction, then it is easy to see that it will take many different forms (Stiggins, 1994; Valencia, 1990). The forms of authentic assessments are Formal Assessment:

According to Stiggins (1994), formal assessments provide teachers with a systematic way to evaluate how well students are progressing in a particular instructional programme. For example, Stiggins (1994) explains that

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after completing a four to six-week theme, teachers will want to know how well students have learned the theme skills and concepts. He explains further that teachers may give students a theme test in which students read, answer questions, and write about a similar theme concept thus allowing the teacher to evaluate all the students systematically on the important skills and concepts in the theme by using real reading and writing experiences that fit with the instruction. In other situations, or for certain students, teachers might use a skills test to examine specific skills or strategies taught in a theme (Stiggins, 1994). According to Weaver (2007), teachers, parents, and administrators might want to know how well students are reading and writing in general, independent of the specific instructional programme and this requires a different type of formal assessment. He further states that sometimes, school districts use a standardized norm-reference test or a state test that is administered to only certain grade levels or only once a year. Other times, teachers want similar information, but would like some flexibility in when and how often they conduct the assessment (Valencia, 1990). For example, Stiggins (1994) also states that teachers might want to know how well students are reading and writing at the beginning, middle, and end of the year compared with other children at the same grade level. This type of benchmark or anchor test helps teachers determine how well students are progressing over the entire year, and it provides useful information to parents and administrators (Stiggins, 1994). He again explains that two points of comparison are available, the student's growth over time, and the student's performance as compared with his or her grade-level peers. Because this type

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of formal classroom assessment is more flexible than traditional norm-referenced tests, teachers can use out-of-level tests to determine student progress (Stiggins, 1994). Forlizzi (2004) posits that if specific students are performing far below or above grade level, the teacher can give the assessment that best fits with students' needs. In addition, the flexibility allows the teacher to observe students closely as they work and to modify the assessment as needed (Forlizzi, 2004).

Informal Assessment:

Morrison (2008) posits that other forms of authentic assessment are more informal, including special activities such as group or individual projects, experiments, oral presentations, demonstrations, or performances. Some informal assessments may be drawn from typical classroom activities such as assignments, journals, essays, reports, literature discussion groups, or reading logs (Morrison, 2008). According to Forlizzi (2004), it is sometimes difficult to show student progress using actual work, so teachers will need to keep notes or checklists to record their observations from student-teacher conferences or informal classroom interactions. He further explains that informal assessment is as simple as stopping during instruction to observe or to discuss with the students how learning is progressing. Any of these types of assessment can be made more formal by specifying guidelines for what and how to do them, or they can be quite informal, letting students and teachers adjust to individual needs (Forlizzi, 2004). In some situations, the teacher will want all students to complete the same assessments; in others, assessments will be tailored to individual needs. All present good assessment opportunities.

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Stiggins (1994) argues that it is important to use a variety of forms of assessment because for some students, written work is difficult, so too much reliance on it will put them at a disadvantage. Similarly, particular activities or topics will inspire excellent performance in some students and frustrate others (Stiggins, 1994). He further explains that including a variety of types of assessments will ensure that students are provided with ample opportunities to demonstrate their abilities and that teacher will have the information they need to construct a complete, balanced assessment of each student.

Assessment standards

Newman and Wehlage (1993) noted that authentic assessment tasks need to be organized and structured well so that they are contextualized, integrative, related to the curriculum taught, flexible (requires multiple applications of knowledge and skill), open to self-assessment and peer-assessment, contain specified standards and criteria. They again emphasize that authentic assessment task must consider the following standards:

Organization of information: The task asks students to organize, synthesize, interpret, explain, or evaluate complete information in addressing a concept, problem, or issue. Consideration of alternatives: The task asks students to consider alternative solutions, strategies, perspectives, or points of view in addressing a concept, problem, or issue. Disciplinary content: The task asks students to show understanding and/or use of ideas, theories, or perspectives considered central to an academic or professional discipline. Disciplinary process: The task asks students to use methods of inquiry, research, or communication characteristic of an academic or professional

discipline. Elaborated written communication: The task asks students to elaborate on their understanding, explanations, or conclusions through extended writing.

Problem connected to the world beyond the classroom: The task asks students to address a concept, problem, or issue that is similar to the one that they have encountered or are likely to encounter in life beyond the classroom.

Audience beyond the school: The task asks students to communicate their knowledge, present a product or performance, or take some action for an audience beyond the teacher, classroom, and school building.

Standards of authentic instruction

Herrington and Oliver (2000) also state that in order to obtain the desired outcome teachers must ensure that authentic assessment tasks reflect on the following:

Higher-order thinking: Instruction involves students in manipulating information and ideas by synthesizing, generalizing, explaining, or arriving at conclusions that produce new meaning and understandings for them. Deep knowledge: Instruction addresses central ideas of a topic or discipline with enough thoroughness to explore connections and relationships and to produce relatively complex understanding. Substantive conversation: Students engage in extended conversational exchanges with the teacher and/or peers about subject matter in a way that builds an improved and shared understanding of ideas or topics. Connections to the world beyond the classroom: Students make connections between substantive knowledge and either public problems or personal experiences.

Moving toward authentic assessment

Wiggins (1993), states that assessing students' knowledge has always been a difficult task, especially in today's climate of standards driven curriculum. He again argues that challenges to educators include meeting content standards, assessing students' progress and focusing on diverse learning styles as well as preparing students for work and life beyond the schools. To meet these challenges, educators need to employ more authentic instructional approaches than the traditional knowledge-based curricula (DeCastero-Ambrosetti & Cho, 2005).

According to Callison (1998), the increased interest in authentic assessment is based on two major issues: Current assessment procedures do not assess the full range of essential student outcomes, and teachers have difficulty using the information gained for instructional planning. Multiple-choice examinations, for example, have emphasized the assessment of discrete skills and do not contain authentic representations of classroom activities, social interactions, use of multiple resources, or real-life situations (Callison, 1998).

Another challenge is addressing the needs of a growing diverse student population. Research indicates that students are now culturally diverse and continue to be diverse in their learning needs and learning styles (Cushner, McClelland, & Safford, 1996).

Additionally, teachers often fail to note cultural and linguistic differences that can affect how children learn (Nieto, 1996). He further argues that this lack of knowledge may result in teachers having difficulty accepting

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differences and appropriately accommodating students' needs. Consequently, teachers must embrace the differences that all children bring with them in order to educate each of them according to his/her own needs (Nieto, 1996).

Wiggins (1990) also assert that in the classrooms, students are expected to read interesting literature, write creative papers, integrate resource information with personal viewpoints, work on projects in teams or other cooperative settings, share information while summarizing their conclusions, and use information from one content area (such as science or math) to solve problems and integrate information in other content areas (such as social studies, history or economics).

The move towards authentic assessment, according to Wiggins (1990), is designed to;

1. make students successful learners with acquired knowledge

2. provide students with a full range of skills (e.g., research, writing, revising, oral skills, debating, and other critical thinking skills)

3. demonstrate whether the student can generate full and valid answers in relation to the task or challenge at hand

4. provide reliability by offering suitable and standardized criteria for scoring such tasks and challenges

5. give students the chance to 'rehearse' critical thinking in achieving success in their future adult and professional lives

6. allow for assessment that meets the needs of the learners by giving authenticity and usefulness to results while allowing students greater

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potential for improving their learning and teachers more flexibility in instruction

Authentic assessment tasks and strategies

The authentic assessment tools must be carefully selected to provide opportunities for students to practice and perform meaningful tasks that are reflective of life outside of the classroom (Wiggins, 1990). Mabry (1999) noted that teachers must match purpose or outcome expectations with assessment strategies. Again he emphasizes that teachers need to consider the following questions when selecting authentic assessment tools: What do we want to assess and do we really need to assess it? Why do we want to assess it and what will we do with the results? How should we assess and how can we get the information we need? How can we assess without harmful side effects? The central issue here has to do with tool selection (Mabry, 1999). Given a particular problem, situation, or set of questions, teachers need to learn to ask, what is the best tool for the job? (Mabry, 1999).

Teachers will need to use a variety of assessment stategies and techniques in order to enable all students to have a more complete picture of their growth and achievement (Wiggins1990). Marking good use of assessment strategies in assessing students helps them to examine their strength and weakness and this result in improving teaching practice. Students understand lessons better when they are brought on board during teaching and process (Eshun et al., 2014).

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Graphic organizers and concept mapping

According to Burke (1994), graphic organizers are visual representations of mental maps using important skills such as sequencing; comparing, contrasting, and classifying thus involving students in active thinking about relationships and associations that help students make their thinking visible. Burke (1994) again states that many students have trouble connecting or relating new information to prior knowledge because they cannot remember things and graphic organizers help them remember because they make abstract ideas more visible and concrete. This is particularly true for visual learners who need graphic organizers to help them organize information and remember key concepts (Burke 1994). Teachers can help students use graphic organizers by modeling and using topics that can be easily understood (Burke, 1994). Murphy (1994) also argues that students can develop skills in developing graphic organizers if they are allowed to work first in small groups and can select a topic of their choice related to the lesson content.

Although graphic organizers are learning tools, they can also effectively be used as authentic assessment tools (Murphy, 1994). He further explains that teachers who involve students with graphic organizers need to develop exemplary models that can be used for assessment. Hart (1994) states that criteria describing what content and relationships should be visually shown in student work need to be developed and used in rubric (scoring) form to make assessments more objective. He then argues that similar to essay questions, which require written expression in a connected manner; graphic

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organizers require students to present information in written and visual format. Graphic organizers also can be used as a test item format to assess student learning thus providing students with a creative and engaging way of expressing what they know and are able to do (Hart, 1994).

Live performances and presentations

Herrera, Murry, and Cabral (2007) argue that the key to effective assessment of live performances and presentations is establishing the criteria and performance indicators in advance. They further state that criteria and performance indicators effectively organized into scoring rubrics provide examples of what students must do to demonstrate that they have learned at a specified level. According to Herrera, Murry, and Cabral (2007), the most important assessment strategy with live performances and presentations is to engage students in assessing their own performance first, followed by teacher assessment and an opportunity for students and teachers to interact over assessment findings. Live presentations involve two major assessment factors: One is the quality of the assigned work and the second is the demonstration of presentation skills. Scoring rubrics must include both of these factors (Herrera et al, 2007).

Portfolios

According to Wiggins and McTighe (2007), another alternative assessment tool that has attracted widespread popular attention is portfolios. According to Wiggins (1990) and McTighe (2007), portfolios are collections of student work gathered over time such that the contents of portfolios can range from comprehensive coverage containing a plethora of materials to

those that are quite selective, containing only a limited number of student-selected items. Herrera et al. (2007) also argues that student portfolios offer a range of flexibility that makes the method attractive to a wide range of teachers and programs. Portfolio assessment offers many advantages, but Frazier and Paulson (1992) note that the primary value of portfolios is that they allow student the opportunity to evaluate their own work. Further, Frazier and Paulson (1992) argue that portfolio assessment offers students a way to take charge of their learning. It also encourages ownership, pride, and high self-esteem.

According to Wiliam and Thompson (2008), gathering purposeful examples of students' work that demonstrates their efforts, progress and level of understanding over a period of time compose the main features of portfolio. However what has changed through the course of time is the format and content making portfolio meaningful and purposeful. Wiggins and McTighe (2007) maintain that unlike the traditional forms of assessment that take a "snapshot" of students at a point in time, portfolio "functions like a photo album containing a variety of photos taken at different times and different contexts" (p 18). Portfolios can be maintained over several years and can be used as "pass-ports" as students move from one level of education to another (Herrera et al., 2007). Portfolio assessment requires careful thought and preparation on the part of both teachers and students (Wiggins & McTighe, 2007).

In addition, Frazier and Paulson (1992), again posit that portfolios are considered a good alternative to traditional forms of assessment because they

incorporate the perspective of students and teachers about learning. Another significance of a portfolio is that unlike the traditional synoptic evaluations, such as the final exams or any standardized test that happens once, portfolios provide a longitudinal observation of students' progress as they show incremental gains in knowledge, skills and proficiencies (Herrera et.al 2007). Portfolios are also authentic because they are driven by classroom activities (Frazier & Paulson 1992). In most cases they reflect "in-process adaptations to instructional methods and assessment", and they assess learning which motivates students (Herrera et.al, 2007 p. 32).

Learning logs and journals

Learning logs and journals are tools designed to cause students to reflect on what they have learned or are learning (Black & William, 1998). Used properly, they encourage student self-assessment and provide a mechanism for making connections across the various subject matter areas (Black & William, 1998). According to Herman, Aschbacher and Winters (1992), journals have been used widely in English classes for many years and now they are being adopted by other teachers to develop communication skills and to help students to make connections, examine complex ideas, and think about ways to apply what they have learned over an extended period of time. Herman, Aschbacher and Winters (1992) again indicated that the fundamental purpose of learning logs and journals is to "allow students to communicate directly with the teacher regarding individual progress, particular concerns, and reflections on the learning process" (p. 2).

A distinction can be made between learning logs and journals. Learning logs usually consist of short, objective entries under specific heading such as problem solving, observations, questions about content, lists of outside readings, homework assignments, or other categories designed to facilitate record keeping (Burke, 1994) thus student responses are typically brief, factual, and impersonal. Fogarty and Bellanca (1987) recommend teachers provide lead-ins or stem statements that encourage students responses that are analytical (breaking something down into its parts), synthetic (putting something together into a whole), and evaluative (forming judgment about the worth of something). Journals are collection of notes, observations, thoughts, and other relevant materials that are documented which enable students to make connections with previous knowledge, to understand the obstacles that go into acquiring that knowledge and to chart their own development and personal growth (Levant, 2001). Levant (2001) noted that journals are excellent tools that students can use to create a record of what they have learned.

Learning logs and journals can be effective instructional tools to help students sharpen their thinking and communication skills. They give students the opportunity to interact with the teacher, lesson content, textbooks, and each other. They also afford students an opportunity to think about material, clarify confusion, discuss key ideas with others, connect with previous learning and experiences, and reflect on the personal meaning of subject matter. They provide a record overtime of what has been presented and learned. Furthermore, logs and journals are typically best used to promote

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formative assessment, although they also can be structured to provide summative assessment information.

Projects

Project is a planned set of interrelated and sometimes dependent task that must be executed over a certain period of time taking into consideration certain costs, resources and other limitations (Rodney, 1993). He defined project as a set of inputs and outputs needed to reach a specific outcome. According to Miller and Crocker (2005) project demands assessment practices that ensure that all learners are supported in the learning process.

Many different types of projects can be developed to challenge students to produce something rather than reproduce knowledge on traditional tests. Projects allow students to demonstrate a variety of skills including communication, technical, interpersonal, organizational, problem-solving, and decision making skills (Burke, 1994). Projects also provide students with opportunities to establish criteria for determining the quality of the planning and design processes, the construction process, and the quality of the completed project.

Computer-based simulation task

Vendlinski, Baker, and Niemi (2008) explain computer-based simulations task as an assessment tool that makes it possible to assess complex thinking skills that cannot be measured well by more traditional assessment methods. Using extended, integrated tasks, a large problem-solving space with various levels of complexity can be provided in an assessment (Vendlinski, Baker, & Niemi, 2008). According to Bennett, Persky, Weiss, and Jenkins,

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(2007), computer-based simulation tasks can assess student competency in formulating, testing, and evaluating hypotheses; selecting an appropriate solution strategy; and when necessary, adapting strategies based on the degree of success to a solution. They again indicate that an attractive feature of computer-based simulation tasks is that they can include some form of immediate feedback to the student according to the course of actions taken by the student. Other important features of computer-based simulations include the variety of the types of interactions that a student has with tools in the problem-solving space, and the monitoring and recording of how a student uses these tools (Vendlinski et al., 2008).

Technology used in computer-based simulations allow assessments to provide more meaningful information by capturing students' processes and strategies, as well as their products. Information on how a student arrived at an answer or conclusion can be valuable in guiding instruction and monitoring the progression of student learning (Bennett, Persky, Weiss, & Jenkins, 2007). The use of automated scoring procedures for evaluating student performances to computer-based simulation tasks addresses the cost and time demands of human scoring (Bennett, Persky, Weiss, & Jenkins, 2007). Several issues need to be considered in the design of computer-based simulations such as the examinee's familiarity with the navigation rules and controls imposed by the computer interface and testing network requirements, the potential requirement of examinees' to record their answers in an unusual manner, and the large amount of data that needs to be summarized in a meaningful way (Bennett, 2007; DeVore, 2002).

O'Malley and Pierce (1996) have also categorized common types of authentic assessment and the student actions that should be observed and documented. Their examples include the following:

Oral interviews

Teacher asks students questions about personal background, activities, readings, and other interests. This type of task is informal and relaxed in context and is conducted over successive days with each student record observations on an interview guide.

Story or test retelling

Students retell main ideas or selected details of text experienced through listening or reading. Also students are asked to produce oral report, and are scored on content or language components. The task is then scored with rubric or rating scale. This task can be used to determine reading comprehension, reading strategies, and language development.

Writing samples

Students generate narrative, expository, persuasive, or reference paper. Students are guided to produces written document that can be scored on content or language components. They are also scored with rubric or rating scale based on their writing processes

Projects/ exhibitions

With this task, students are made to complete a project in content area. They either work individually or in pairs and also make formal presentation, written report, or both. Students are also asked to observe oral or written

products which sharpen their thinking skills. This task is then scored with rubric or rating scale

Experiments/ demonstrations

Students complete experiment or demonstrate use of materials. Students also make oral presentation, written report, or both. Students can also observe oral and written products. This improves their thinking skills. Task is then scored with rubric or rating scale.

Constructed-response items

Students respond in writing to open-ended questions. Students produce written report which is usually scored on substantive information. They are also scored with rubric or rating scale.

Teacher observations

Teacher observes student attention, response to instructional materials, or interactions with other students. The setting used for this task is the classroom environment and it takes little time to do the observation. Teacher records observations with anecdotal notes or rating scales.

Challenges of using authentic assessment

A major limitation in using authentic assessment is that they do not fit well within existing school organization and culture (Resnick, 1987). According to Resnick (1987), the organizational features of schools, including teacher workload, class scheduling, material resources, and assessments that measure knowledge of simple facts, are structured for traditional instruction and narrow assessment. Furthermore, he emphasizes that school norms typically involve students in learning directly from either the teacher or

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textbook. Authentic tasks involve a different way of thinking about tasks in classrooms and they also require more instructional time and resources, a different instructional stance on the part of teachers, and more effort on the part of students (Resnick, 1987).

Wiggins (1990) asserts that using authentic assessment comes with some challenges which include cost effectiveness, effort and time requirements, and public suspicions regarding the objectivity of authentic assessment. Dunbar, Koretz, and Hoover (2008) also argue that with more complex tests on large scale though the effort is worthy, the cost and time to create and score authentic assessment tasks year to year could make it too impractical and artificial intelligence is likely to play a big role in scoring of such exams. Schleicher (as cited in Darling-Hammond & Snyder 2000) also argues that the biggest hurdles in using authentic assessment are time and money. Richer tests require more of both time and money to design and administer them. Dunbar et al. (2008) explain that authentic assessments can help to determine how well teachers have taught or students have mastered a skill but are too broad to brush for the details at the school and classroom level.

According to the report of Todorov and Brousseau (1998**)**, there are several challenges to using authentic assessment methods. They include managing its time-intensive nature, ensuring curricular validity, and minimizing evaluator bias. Yang (2015) also noted that authentic assessment comes with two major challenges. He argues that   authentic assessment is more time consuming than the traditional assessment. He further states that

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teachers spend more time in designing the classes and assessing students' performance to facilitate higher cognitive learning. Yang's (2015) second challenge comes from the subjectiveness in authentic assessment. The evaluations of cognitive learning level (analyze, create and evaluate) on which authentic assessment is focused is more subjective than the traditional assessment. Therefore, it is always assumed that the teacher would be at a better position to evaluate students. However, this may not always be true as students may sometimes be involved in the judgment.

Despite these challenges, efforts must be made to appropriately assess all students and to welcome the possibility of assessment strategies that can empower students to take control of their own learning and to become independent thinkers (Todorov & Brousseau, 1998).

Theoretical Framework

Effective and sound assessment practice begins with the instructors' knowledge, understanding and perception of it. The theoretical framework of this research was based on the Constructivist learning theory.

Constructivist learning theory

Constructivist learning theory says that all knowledge is constructed from a base of prior knowledge (Davis, 1991). According to Vigosky (cited in Davis 1991), children are not blank slate and knowledge cannot be imparted without the child making sense of it according to their current conceptions; therefore, children learn best when they are allowed to construct a personal understanding based on experiencing things and reflecting on those experiences. Davis (1991) again states that learners are the makers of meaning

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and knowledge and constructivist teaching fosters critical thinking, and creates motivated and independent learners. This theoretical framework holds that learning always builds upon knowledge that a student already has; this prior knowledge is called a schema (Davis, 1991). He then explains that because all learning is filtered through pre-existing schemata, constructivists suggest that learning is more effective when a student is actively engaged in the learning process rather than attempting to receive knowledge passively.

James and Pedder (2006) also state that the focus of constructivists is on how people construct meaning and make sense of the world through organizing structures, concepts and principles in schema (mental models). According to James and Pedder (2006), prior knowledge is regarded as a powerful determinant of a pupil's capacity to learn new material. He then indicates that cognitive constructivists emphasize 'understanding,' thus problem solving is seen as the context for knowledge construction. Davis (1991), again argues that processing strategies, such as deductive reasoning from principles and inductive reasoning from evidence, are important and as a result, differences between experts and novices are marked by the way in which experts organize knowledge structures and their competence in processing strategies.

Torrance and Pryor (2001), point out that the interaction between teacher-pupil goes further than just finding out whether the pupil has reached the target behaviour, as in behaviourism. Teacher-pupil interaction in a test situation goes beyond the communication of test results, the judgments of progress and the provision of additional instruction, to include a role for the

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teacher in assisting the pupil to comprehend and engage with new ideas and problems (Torrance & Pryor 2001). To them, the process of assessment itself is seen as having an impact on the pupil, as well as the product or the result.

Harlen (2006) stated that the constructivists' view of learning focuses attention on the processes of learning and the role of learners. Teachers engage pupils in self-assessment and use their own assessment to try to identify their current understanding and levels of skills.

Examples of constructivist activities

The constructivist classroom, students work primarily in groups and learning and knowledge are interactive and dynamic (Harlen, 2006). Davis (1991) states that with the constructivist classroom, there is a great focus and emphasis on social and communication skills, as well as collaboration and exchange of ideas which is contrary to the traditional classroom in which students work primarily alone, learning is achieved through repetition. He further argues that the subjects are strictly adhered to and are guided by a textbook. According to Duffy, Jonassen and Lowyck (1993), some activities encouraged in constructivist classrooms are:

1. Experimentation: Students individually perform an experiment and then come together as a class to discuss the results.

2. Research projects: Students research a topic and can present their findings to the class.

3. Field trips. This allows students to put the concepts and ideas discussed in class in a real-world context. Field trips would often be followed by class discussions.

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4. Films. These provide visual context and thus bring another sense into the learning experience.

5. Class discussions. This technique is used in all of the methods described above. It is one of the most important distinctions of constructivist teaching methods.

Constructivists' assessment

Traditionally, assessment in the classrooms is based on testing thus it is important for the student to produce the correct answers (Davis, 1991). However, he further posits that in constructivist teaching, the process of gaining knowledge is viewed as being just as important as the product. Thus, assessment is based not only on tests, but also on observation of the student, the student's work, and the student's points of view (Davis, 1991). According to Davis (1991), some constructivists' assessment strategies include:

1. Oral discussions. The teacher presents students with a "focus" question and allows an open discussion on the topic.

2. What we know, what we want to know, what we have learned, How we know it (KWL-H) Chart. This technique can be used throughout the course of study for a particular topic, but is also a good assessment technique as it shows the teacher the progress of the student throughout the course of study.

3. Mind Mapping. In this activity, students list and categorize the concepts and ideas relating to a topic.

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4. Hands-on activities. These encourage students to manipulate their environments or a particular learning tool. Teachers can use a checklist and observation to assess student success with the particular material.

Dimensions of learning model

Assessing students' outcomes

Dimensions of Learning are an instructional framework based on the best of what research and theory say about learning. Its premise is that five types of thinking (the five dimensions of learning) are essential to successful learning (Marzano, Pickering & McTighe, 1993). The framework's strong grounding in research and theory, however, makes it a natural partner for authentic assessment. According to Marzano, Pickering and McTighe (1993) Dimensions of Learning and authentic assessment share similar assumptions about the nature of learning and the art and science of teaching. In fact, it is believed that Dimensions of Learning can help educators answer one of the most frequently asked questions concerning authentic assessment: How do you teach to authentic assessment? (Marzano, Pickering & McTighe, 1993).

The instructional model can be used to develop a practical approach to students' assessment that answers many of the recent demands for reforms (Marzano, Pickering & McTighe, 1993). For instance, they address the need for educators to specify not only the content-specific knowledge and skills students should acquire, but also the knowledge and skills that cut across many content areas and are useful to people in many situations during their lifetime. The dimensions of learning model as described by Marzano, Pickering and McTighe, (1993) is presented in figure 1.
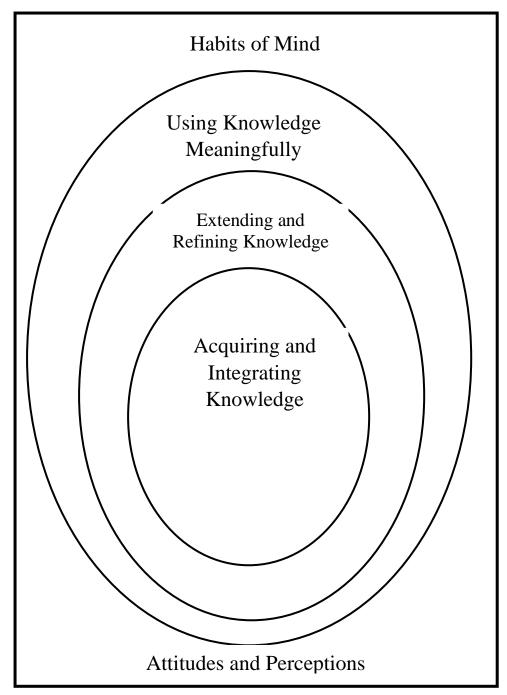
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Habits of Mind

Using Knowledge
Meaningfully

Extending and
Refining Knowledge

Acquiring and
Integrating
Knowledge

Attitudes and Perceptions

Fig 1: The Dimension of Learning Model (Marzano, Pickering & Mctighe,

1993).

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Before describing how to approach authentic assessment using Dimensions of Learning, it is important to briefly consider the framework itself (Marzano, Pickering & McTighe, 1993).

Dimension 1: Positive Attitudes and Perceptions about Learning;

Without positive attitudes and perceptions, students have little chance of learning proficiently, if at all. In other words, for learning to occur, students must have certain attitudes and perceptions. Feeling comfortable in the class-room, for instance, is important to learning. If a student does not believe the classroom is a safe and orderly place, she will probably learn little in that classroom. Similarly, if she does not have positive attitudes about classroom tasks, she probably won't put much effort into them and, again, her learning will suffer. A primary focus of effective instruction, then, is establishing positive attitudes and perceptions about learning.

Dimension 2: Acquiring and Integrating Knowledge;

Helping students acquire new knowledge, integrate it with what they already know, and retain it is an important aspect of learning. When content is new, a teacher's instructional planning must focus on strategies that will help students relate new knowledge to prior knowledge, organize the new knowledge in meaningful ways, and make it part of their long-term memory. For example, a teacher might help students relate the new information they are learning to what they already know by helping them create an analogy for the new information. He might suggest that they construct an outline or a graphic representation of the new information. And he might help students more effectively store information in long-term memory by guiding them through

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the creation of images representing the important aspects of the new information.

Dimension 3: Extending and Refining Knowledge;

Acquiring and integrating knowledge is not the end of the learning process. Learners extend and refine their knowledge, adding new distinctions and making further connections. They analyze what they have learned in more depth and with more rigors. While extending and refining their knowledge, learners commonly engage in the following activities:

1. Comparing

2. Classifying

3. Making inductions

4. Making deductions

5. Analyzing errors

6. Creating and analyzing support

7. Analyzing perspectives

8. Abstracting

According Marzano, Pickering and McTighe (1993), teachers should consider the following questions when using any assessment form: What information is important for students to extend and refine? What strategies and activities will be used to help students extend and refine their knowledge? They again emphasize that kinds of extending and refining activities chosen should fit naturally with the curriculum content, so as to fully integrate the teaching of cognitive skills and the teaching of content.

Dimension 4: Using Knowledge Meaningfully;

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Marzano, Pickering and McTighe (1993) again argue that according to cognitive psychologists, the most effective learning occurs when students are able to use knowledge to perform meaningful tasks. In effect, the "meaningful task" of making a decision provides an arena for students to learn with a much deeper and richer knowledge than they would if they were not involved in the task. According to them planning instruction so that students have the opportunity to use knowledge meaningfully is one of the most important decisions a teacher can make. In the Dimensions of Learning model, there are five types of tasks that encourage the meaningful use of knowledge (Marzano, Pickering & McTighe, 1993). The five tasks are:

1. Decision making

2. Investigation

3. Experimental inquiry

4. Problem solving

5. Invention

A teacher should look at the content for significant issues or problems that naturally stand out and also the content should determine which of the five tasks a teacher or student might select, not vice versa. Marzano, Pickering and McTighe (1993) again posit that there must be a few questions teachers might think about in order to identify significant issues for the task of investigation:

1. Is there an unresolved issue about how something occurred or why it occurred (historical investigation)

2. Is there an unresolved issue about what would happen if … or what would have happened if. . . ? (projective investigation)

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3. How many issues will be considered?

4. Who will structure the tasks? (Ultimately, students should identify the issues they want to deal with in their projects and the specifics of those tasks. However, teachers must usually first provide structured activities to help students learn how to identify and carry out the activities).

5. What types of products will students produce?

6. To what extent will students work in cooperative groups?

Dimension 5: Productive Habits of Mind.

According to Marzano, Pickering and McTighe (1993), the final aspect of learning is perhaps the most important. They indicate that it concerns the use of productive habits of mind, habits used by critical, creative, and self-regulated thinkers. Although acquiring content knowledge is important, it is perhaps not the most important goal of education (Marzano, Pickering & McTighe, 1993). Ultimately, they note that developing mental habits that will enable individuals to learn on their own, whatever they want or need to know at any point in their lives is probably the most important goal of education. Some of these habits of mind according to Marzano, Pickering and McTighe (1993) include:

1. Being clear and seeking clarity

2. Being open-minded

3. Restraining impulsivity

4. Being aware of your own thinking

5. Evaluating the effectiveness of your actions

6. Pushing the limits of your knowledge and abilities

7. Engaging intensely in tasks even when answers or solutions are not immediately apparent.

When teachers plan lessons, they often do not consciously consider activities or strategies they might use to help students develop productive habits of mind. They focus instead on content and on the need to "cover the curriculum." The Dimensions of Learning model specifies that teachers should consider in their planning questions that focus on developing productive habits of mind:

1. Which mental habits should be emphasized in this unit?

2. Which mental habits will be introduced?

3. How will the mental habits be reinforced?

The relationship among the dimensions of learning

According to Marzano, Pickering and McTighe (1993), it is important to realize that the five dimensions of learning do not operate in isolation but work together in the manner depicted in Figure 1(Dimensions of Learning Model). They further indicate that the model in Figure 1 illustrates that all learning takes place against the backdrop of the learner's attitudes and perceptions (Dimension 1) and his/her use (or lack of use) of the productive habits of mind (Dimension 5). If a student has negative attitudes and perceptions about learning, then he/she will likely learn little. If he/she has positive attitudes and perceptions, he/she will learn more, and learning will be easier. Similarly, when a student uses productive habits of mind, that student facilitates his/her learning; when he/she does not use productive habits of mind he/she hinders her learning. Dimensions 1 and 5, then, are always factors

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in the learning process. This is why they are part of the background of the Dimensions of learning model (Figure 1)

According to Marzano, Pickering and McTighe (1993) given that proper attitudes and perceptions are in place and productive habits of mind are being used, learning is a matter of acquiring and integrating new knowledge (Dimension2). They further explain that usually the learner extends and refines knowledge as he acquires and integrates it. This is why the circle representing Dimension 2 overlaps the circle representing Dimension 3. While these two types of learning are going on, the learner should also be using knowledge meaningfully (Dimension 4)-applying his knowledge to round out the learning process. The most effective learning is a product of the interaction of these five distinct types of thinking that is called the dimensions of learning.

The importance of understanding the dimensions of learning model

The brief description of the Dimensions of Learning model given by Marzano, Pickering and McTighe (1993) implies that there must be some significant changes in the nature and function of schooling. For example, they argue that if teachers want students to engage in complex tasks in which they will use knowledge in unique and meaningful ways (Dimension 4) and if teachers want them to cultivate such higher level mental skills as restraining impulsivity and being aware of their own thinking (Dimension 5), then the methods of assessment must surely change. Marzano, Pickering and McTighe (1993) state that because most of today's assessments make no attempt to measure such behaviors; they are not linked to the kinds of learning teachers want to see.

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Marzano, Pickering and McTighe (1993) assert that the nature and delivery of curriculum must change to become more strongly linked to learning and assessment. To illustrate how both assessment and curriculum must change then a school should truly wish to institutionalize the principles of Dimensions of Learning (Marzano, Pickering & McTighe, 1993).
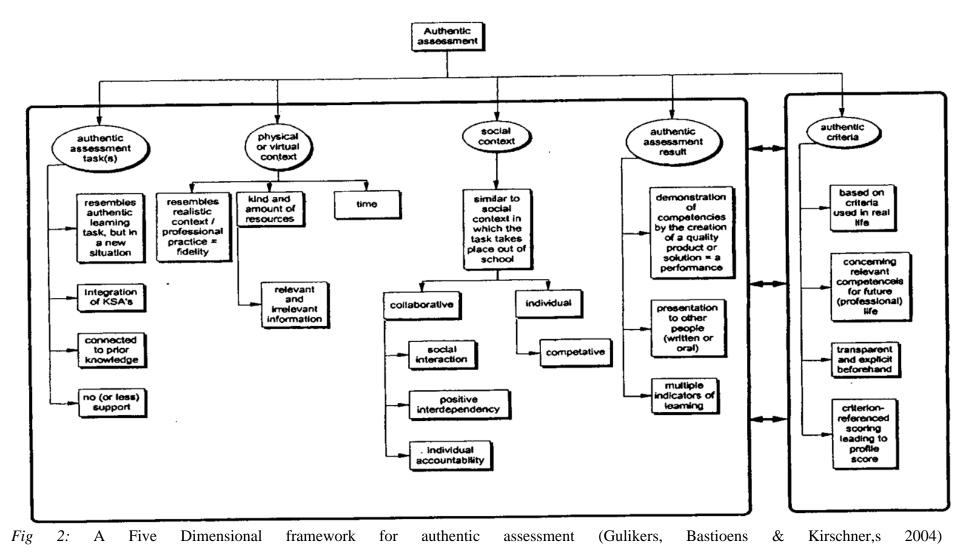
A five-dimensional framework for authentic assessment

There is confusion and there exist many differences of opinions about what authenticity of assessment really is, and which assessment elements are important for authenticity (Gulikers, Bastiaens, & Kirschner 2004). The notion of authenticity as a continuum (Newmann & Wehlage, 1993) resulted in a conceptualization of these five aspects as dimensions that can vary in their degree of authenticity.

Five dimensions of authentic assessment were distinguished by (Gulikers, Bastiaens, & Kirschner, 2004). In Figure 2, the five-dimensional framework include: (a) the assessment task, (b) the physical context, (c) the social context, (d) the assessment result or form, and (e) the assessment criteria. These dimensions can vary in their level of authenticity (i.e., they are continuums). It is a misconception to think that something is either authentic or not authentic (Cronin, 1993; Newmann & Wehlage, 1993), because the degree of authenticity is not solely a characteristic of the assessment chosen; it needs to be defined in relation to the criterion situation derived from professional practice. For example, Gulikers, Bastioens and Kirschner (2004) state that carrying out an assessment in a team is authentic only if the chosen assessment task is also carried out in a team in real life. The main point of the

framework, according to Gulikers, Bastioens and Kirschner (2004), is that each of the five dimensions can resemble the criterion situation to a varying degree, thereby increasing or decreasing the authenticity of the assessment. Because authentic assessment should be aligned to authentic instruction (Biggs, 1996; Merrienboer, 1997), the five dimension framework for authentic assessment is also applicable to authentic instruction. This is logical, because the learning task stimulates students to develop the competencies that professionals have and the assessment task asks students to demonstrate these same competencies without additional support (Merrianboer, 1997). Schnitzer (1993) stressed that for authentic assessment to be effective, students need the opportunity to practice with the form of assessment before it is used as an assessment. This implies that the learning task must resemble the assessment task, only with different underlying goals (Gulikers, Bastioens & Kirschner, 2004). They further stressed that learning tasks are for learning, and assessment tasks are for evaluating student levels of learning in order to improve (formative), or in order to make decisions (summative). The Five-Dimensional Framework in Figure 2 shows how teachers can deal with a (conceptual) alignment between authentic instruction and authentic assessment.

Fig   2:   A   Five   Dimensional   framework   for   authentic   assessment   (Gulikers,   Bastioens   &   Kirschner,s   2004)

Authentic assessment task

An authentic task is a problem task that confronts students with activities that are also carried out in professional practice (Gulikers, Bastioens & Kirschner, 2004). They further posit that the framework defines an authentic task as a task that resembles the criterion task with respect to the integration of knowledge, skills, and attitudes, its complexity, and its ownership. The fact that an authentic task is crucial for an authentic assessment is undisputed (Herrington & Herrington, 1998; Wiggins, 1993).

Furthermore, Kirschner, Martens, and Strijbos, (2004), assert that the users of the assessment task should perceive the task as representative, relevant, and meaningful. An authentic assessment requires students to integrate knowledge, skills, and attitudes as professionals do (Merrienboer, 1997). Again, the assessment task should resemble the complexity of the criterion task (Petraglia, 1998; Uhlenbeck, 2002). This does not mean that every assessment task should be very complex. Even though most authentic problems are complex, involving multidisciplinarity, ill-structured, and having multiple possible solutions (Herrington & Herrington, 1998; Kirschner, 2002; Wiggins, 1993), real-life problems can also be simple, well-structured with one correct answer, and requiring only one discipline (Cronin, 1993).

Gulikers, Bastioens and Kirschner (2004) again stress that, the need for resemblance holds for ownership of a task and of the process of developing a solution. Ownership for students in the assessment task should resemble the ownership for professionals in the criterion task (Gulikers, Bastioens & Kirschner, 2004). Savery and Duffy (1995) argued that giving students ownership of the task and the process to develop a solution is crucial for

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engaging students in authentic learning and problem solving. On the other hand, in real life, assignments are often imposed by employers, and professionals often use standard tools and procedures to solve a problem, both decreasing the amount of ownership for the employer (Gulikers, Bastioens & Kirschner, 2004).

According to Gulikers, Bastioens and Kirschner (2004), the theoretical framework indicate that in order to make students competent in dealing with professional problems, the assessment task should resemble the complexity and ownership levels of the real-life criterion situation. Sambell, McDowell, & Brown (1997), showed that it is crucial that students perceive a task as relevant, that (a) they see the link to a situation in the real world or working situation; or (b) they regard it as a valuable transferable skill. McDowell (1995) also stressed that students should see a link between the assessment task and their personal interests before they perceive the task as meaningful. Clearly, perceived relevance or meaningfulness of the task will differ from student to student and will possibly even change as students become more experienced (Gulikers, Bastioens & Kirschner, 2004).

Physical context

According to Sambell, McDowell, and Brown (1997), where we are as individuals, determines how we do something, and often the real place is dirtier (literally and figuratively) than safe learning environments. Physical environment may possibly involve a war zone, inclement weather conditions, space, and equipment (Sambell, McDowell, & Brown 1997). Sambel et al. (1997) again argue that even though a task may be authentic, it can be questioned whether assessing students in a clean and safe environment really

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assesses their ability to wisely use their competencies in real-life situations. The physical context of an authentic assessment should reflect the way knowledge, skills, and attitudes will be used in professional practice (Brown et al., 1989; Herrington & Oliver, 2000). Authentic assessment often deals with high fidelity contexts (Alessi, 1988). According to Alessi (1988), the presentation of material and the amount of detail presented in the context are important aspects of the degree of fidelity. Likewise, an important element of the authenticity of the physical context is that the number and kinds of resources available which mostly contain relevant as well as irrelevant information (Herrington & Oliver 2000), should resemble the resources available in the criterion situation (Segers, Dochy, & De Corte, 1999). For example, Resnick (1987) argued that most school tests involve memory work, while out-of-school activities are often intimately engaged with tools and resources (calculators, tables, standards), making such school tests less authentic.

Segers, Dochy, and De Corte (1999) argued that it would be inauthentic to deprive students of resources, because professionals do rely on resources. According to Segers, Dochy, and De Corte (1999), another important characteristic crucial for providing an authentic physical context is the time students are given to perform the assessment task. Alessi (1988) also argues that in real life, professional activities often involve more time scattered over days or, on the contrary, require fast and immediate reaction in a split second. Wiggins (1993) said that an authentic assessment should not rely on unrealistic and arbitrary time constraints. In sum, the level of

authenticity of the physical context is defined by the resemblance of these elements (time, space and equipment) to the criterion situation.

Social context

Not only the physical context, but also the social context, influences the authenticity of the assessment (Gulikers, Bastioens & Kirschner, 2004). In real life, working together is often the rule rather than the exception, and Resnick (1987) emphasized that learning and performing out of school mostly takes place in a social system. Therefore, a model for authentic assessment should consider social processes that are present in real life contexts (Gulikers, Bastioens & Kirschner, 2004). What is really important in an authentic assessment is that the social processes of the assessment resemble the social processes in an equivalent situation in reality. Herrington and Herrington (1998), based on the framework, argue that if the real situation demands collaboration, the assessment should also involve collaboration, but if the situation is normally handled individually, the assessment should be individual. When the assessment requires collaboration, processes such as social interaction, positive interdependency and individual accountability teachers need to take the processes into account when assessing students (Slavin, 1989). Slavin again argues that when, however, the assessment is individual, then the social context should stimulate some kind of competition between learners.

Authentic assessment result

Moerkerke, Doorten, and Roode, (1999) state that an assessment should involve an assessment assignment (in a certain physical and social context) that leads to an assessment result, which is then, evaluated against

certain assessment criteria (rubrics). Gulikers, Bastioens and Kirschner (2004) again state that the assessment result is related to the kind and amount of output of the assessment task, independent of the content of the assessment. In the framework, an authentic result or form is characterized by four elements. (a) It should be a quality product or performance that students can be asked to produce in real life (Wiggins, 1989). (b) This product or performance should be demonstration that permits making valid inferences about the underlying competencies (Darling-Hammond & Snyder, 2000). (c) Since the demonstration of relevant competencies is often not possible in one single test, an authentic assessment should involve a full array of tasks and multiple indicators of learning in order to come to fair conclusions (Darling- Hammond & Snyder, 2000). Uhlenbeck (2002) showed that a combination of different assessment methods adequately covered the whole range of professional teaching behavior. (d) Finally, students should present their work to other people, either orally or in written form, because it is important that they defend their work to ensure that their apparent mastery is genuine (Wiggins, 1989).

Authentic criteria and standards

Criteria are those characteristics of the assessment result that are valued. Standards are the level of performance expected from various grades and ages of students (Gulikers, Bastioens & Kirschner, 2004). They further argue that setting criteria and making them explicit and transparent to learners beforehand is important in authentic assessment. This is because it guides learning and, after all, in real life, employees usually know on what criteria their performances will be judged (Sluijsmans, 2002). This implies that

authentic assessment requires criterion-referenced judgment (Arter & Spandel, 1992). Moreover, some criteria should be related to a realistic outcome, explicating characteristics or requirements of the product, performance, or solutions that students need to create (Sluijsmans, 2002). Furthermore, criteria and standards should concern the development of relevant professional competencies and should be based on criteria used in the real life situation. Darling-Hammond & Snyder, (2000) also argue that apart from basing the criteria on the criterion situation in real life, criteria of an authentic assessment can also be based on the interpretation of the other four dimensions of the framework. For example Gulikers, Bastioens & Kirschner (2004), indicate that if the physical context determines that an authentic assessment of a competency requires five hours, a criterion should be that students need to produce the assessment result within five hours. In other words, the framework argues for a reciprocal relationship between the criterion dimension and the other four dimensions.

Some considerations

What does all of this mean when teachers or instructional designers try to develop authentic assessments? What do teachers need to consider? According to Gulikers, Bastioens and Kirschner (2004), the first consideration, deals with predictive validity. According to Darling-Hammond and Snyder (2000), if the educational goal of developing competent employees is pursued, then increasing the authenticity of an assessment will be valuable. Wiggins (1989) also asserts that more authenticity is likely to increase the predictive validity of the assessment because of the resemblance between the assessment and real professional practice. Wiggins (1989) again recommends that

objective tests are still very useful for certain purposes as high-stakes summative assessments on individual achievement, where predicting student ability to function competently in future professional practice is not the purpose.

Another consideration in designing authentic assessment is that teachers should not lose sight of the educational level of the learners (Sweller, Merrienboer, & Paas, 1998). According to them, lower level learners may not be able to deal with the authenticity of a real, complex, professional situation. If they are forced to do this, it may result in cognitive overload and, in turn, have a negative impact on learning (Sweller, Merrienboer, & Paas, 1998). As a result, a criterion situation will often need to be an abstraction of real professional practice in order to be attainable for students at a certain educational level. Merrianboer (1997) argued that an abstraction of real professional practice (i.e., the criterion situation) can still be authentic as long as the abstracted situation requires students to perform the whole competency as an integrated whole of constituent competencies.

A third consideration also sheds a light on the subjectivity of authenticity. The perception of what authenticity is may change as a result of educational level, personal interest, age, or amount of practical experience with professional practice (Honebein, Duffy, & Fishman, 1993). This implies that the five dimensions that are argued in the framework for authentic assessment are not absolute but, rather, variable Honebein et al. (1993). Merrianboer (1997) also states that designers must take changing student perspectives into account when designing authentic assessment. The differences and similarities along a limited number of dimensions can give

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insight into what is crucial for defining and designing authentic assessments (Merrianboer, 1997).

Conclusion

Overall, the five-dimensional framework by Gulikers, Bastioens and Kirschner (2004) gives a good description of what dimensions and elements should be taken into account in an authentic assessment. However, elements concerning the assessors and organization issues should be added to complete the framework, as these elements turns out to be important.

Empirical review

Perception in general

According to Lewis (1999), differences in perception are central to both the practice and research in education and it is thus necessary for educational practitioners to understand the reason for differences in perception in order to practice and do authentic research. Lewis (1999) found out in his research that interpretation of information is based on past experience, new situation and other's opinions. Again, it was revealed in his study that perception is not constant and is usually changing, biased, coloured, or distorted by the unique set of experiences. Thus, perceptions are personal interpretations of the real world.

The process of perception consists of three stages: selection, organization and interpretation (Lewis, 1999). According to him, students select information, to which they attend through their sense organs (Sight, sound, smells, taste, and touch). They mentally arrange the information so one can understand or make sense out of the information. Their interpretation is subjective and based on their values, needs, beliefs, experiences, expectations,

involvement, self-concept, and other personal factors. Johnson (1994) also found out that perception is influenced by internal and external factors. According to him, one of the central assumptions of the constructivist approach to perception is that perception is not determined entirely by external stimuli. As a consequence, it is assumed that emotional and motivational states, together with expectation and culture, may influence people's perceptual hypotheses and thus their visual perception (Johnson 1994).

According to Quick and Nelson (1997), the three major characteristics that influence students' perception of other people or object are: the perceiver, the perceived object and the situation.

1. The Perceiver: When an individual looks at the target and attempts to interpret what he/she sees. Such interpretation is heavily influenced by personal characteristics of the individual perceiver. The characteristics of perceiver include person's needs, past experience, habits, personality, values, attitudes etc.

2. The Perceived object: Characteristics of the target, which has been, observed also affects the individual's perception. The physical attributes, appearance and behaviour of other persons in the situation also influences the perception. Physical attributes of the person means age, height, weight, gender etc. Loud people are easily noticeable in a group in comparison to the quiet ones. Motion, sound, size and other attributes of a target also affect the perception of an individual. An object which is perceived is not observed in isolation, the relationship of a target with its background also influences perception. Person, objects or events that are similar to each other also tend to be grouped

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together. The greater the similarity, the greater is the probability that we will tend to perceive them as a common group.

3. The Situation: The physical, social and organizational settings of the situation also influence individual's perception. The situation in which we see objects or events is important. The elements in the surrounding environment influence our perception. For example: hearing a subordinate calling his/her boss by his/her name may be perceived quite differently when observed in an office as opposed to an evening social reception.

McGregor (1993) gives a practical example to illustrate the case in point: When fourteen-year-olds writing an experimental school exit test were asked to trace the shortest distance between two towns, white children got the answer ``right'' while black children got it ``wrong''. The reason being that the black township of Crossroads (situated close to Cape Town) is situated between the two towns in the example. Black children perceived the township as dangerous and thus travelled around the settlement while "unpoliticized" white children, to whom the name Crossroads meant little, if anything at all, took the "correct" straight line.

Teachers' perceptions

Researchers have attempted to investigate teachers' perceptions of assessment in many different ways (Chester & Quilter, 1998). Chester and Quilter believed that studying teachers' perceptions of authentic assessment is important in the sense that it provides an indication of how different forms of authentic assessment are being used or misused and what could be done to

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improve the situation. More critical also is the fact that perceptions affect behavior (Atweh, Bleicker & Cooper, 1998; Calderhead, 1996; Cillessen & Lafontana, 2002).

Panizzon and Pegg (2007) engaged 25 teacher-volunteers to participate in a study representing six secondary rural schools from New South Wales, Australia. The researchers used the Structure of Observed Learning Outcome (SOLO); a cognitive structural model which provided "a basis for both assessing students' understanding and identifying ways of enhancing students' learning" (Panizzon & Pegg, 2007, p. 420). Three two-day workshops were conducted at the University for these teachers, focusing around the SOLO model assessment tasks and teaching strategies of the 25 teacher-volunteers by Panizzon & Pegg (2007). The researchers primarily used two sources of data: "students' scripts coded using the SOLO model" and interviews with teachers. They inquired from the teachers their experiences with the new approach to teaching i.e. (SOLO) and assessment practices to enhance students' learning. The researchers found out that all teachers who participated in this project represented a change in their perception enabling them use collaborative effort to engage students' understanding in their classrooms. According to Panizzon and Pegg (2007), the project helped teachers recognize that restricting the type and style of questions in their teaching and assessment provide limited scope for students to demonstrate their conceptual understanding" (p. 431). Overall, the researchers found out that teachers reported a shift in their perceptions of learning demonstrated in their teaching and assessment practices which was noticed by students and other teachers as well (Panizzon & Pegg, 2007).

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Chester and Quilter (1998) in their study on in-service teachers' perceptions of classroom assessment; standardized testing, and alternative assessment methods in Debre Markos University in Ethiopia concluded that teachers' perceptions of classroom assessment affected their classroom assessment practices. They found out that teachers that attached less value to classroom assessment used standardized tests most of the times in their classrooms. Chester and Quilter went further to say that teachers with negative experiences in alternative assessment and standardized testing are least likely to see the value in various forms of assessment for their classroom. They recommended, therefore, that in-service training should focus on helping teachers see the value of other assessment methods rather than "how to" do assessment.

An interview with a fifth-grade teacher at Deerfield Elementary school in Lexington, USA by Kentucky Department of Education (1991) confirms that teachers are aware of the limitations of standardized tests. They further revealed that the teacher indicated that curriculum must emphasize subjects for which the state accountability test measures proficiency: math, reading, social studies and science. The teacher argued further that test scores do not truly reflect her students' abilities and are too vague to help her pinpoint individual needs (Kentucky Department of Education, 1991). The teacher asserted that she longs for an assessment that relies on more than just written problems that could capture the more diverse skills visible in her classroom and valued in the workplace, such as artistic talent, computer survey, and the know-how to diagnose and fix problems with mechanical devices (Kentucky Department of Education, 1991).

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Authentic assessment practices

A study was conducted by Shepard, Morion, Mayfield, Flexer, and Weston (1995) to examine the effect of authentic assessment on students' learning. A year-long project was undertaken to help teachers in 13 third-grade classrooms to begin to use authentic assessment as part of regular instruction in reading and mathematics. The study was conducted in a working- class and lower-to-middle class school district on the outside of Denver, Colorado. In the 1992-1993 study year, there were 13 third-grade classrooms in three schools combined involving approximately 335 third graders. From the qualitative analysis, the results showed consistent changes in the students' answers to mathematics problems which suggests that at least in some classroom projects, whole groups of students were having opportunities to develop their mathematical understandings that had not occurred previously. The percentage of students in the participating classroom who could write explanations describing a mathematical pattern, telling how a mathematical table is used also increased substantially from 13% to 55%. Even students who took the wrong answers from their table could describe the pattern. Shepard, Morion, Mayfield, Flexer, and Weston (1995) again noted that although the level of student performance is much higher in both schools, the participating classrooms still showed specific improvements in students' performance that can be associated with the project.

McMillan, Myran and Workman (2002) in their study, aimed at describing the nature of classroom assessment and grading practices, using a nationwide teacher survey in the Netherlands. They found out that teachers were mostly interested in assessing students' mastery or achievement and that

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performance assessment was used frequently. McMillan (2001) studied the actual classroom assessment and grading practices of secondary school teachers in relation to specific class in Toronto. He also carried out the study to determine whether meaningful relationships existed between teacher's assessment practices, grade level, subject area, and ability levels of students. McMillan found that there was no meaningful relationship between teacher's assessment practices, grade level, subject area and ability level.

Koh and Luke (2009) also conducted a study in authentic assessment practices and conventional assessment in Singapore schools. The study examined the quality of teacher assignments and students work. Two sets of criteria and scoring rubrics were developed for the training of expert teachers to judge the quality of assignments (projects and learning logs) and students work. The study indicated that the inter-rater reliability of expert teacher scored was very high. Samples of teachers assignments and students work were collected in English, Social Studies, Science and Mathematics subject areas from a random stratified sample of 30 high schools. For all the grade levels there were significant differences for the authentic intellectual quality of teachers' assignments by subject area. Likewise, the differences of authentic assessment quality for students work were significant and varied in the schools used for the study. The correlation between the quality of teachers' assignment task and student work were strong and significant at all subject areas. The study again revealed that where teachers set more intellectually demanding task, students were more likely to generate work or artifacts judged to be of high quality. The researchers suggested that teacher professional development

in authentic assessment tasks design can contribute to the improvement of student learning and performance.

Use of authentic assessment result

A study by Wiggins and McTighe (2007) revealed a consensus existing among teachers and educators that if test occur only at the end of the term, the result can hardly be used to adapt instruction and to improve learning. However, Herrera et al. (2007) also recognized in their study that, the old forms of test are useful only in comparing students, programs and schools through qualitative representation. In addition, Birenbaum (1996) advocates for appropriate use of assessment result and he concludes that assessment result help to improve learning and enhance the instruction. He further revealed that in educational assessment approach, the instructor provides descriptive feedback for students, thus indicating progress and guidance for future performance or remedial form.

Black and William (1998) in their study found out that the positive aspect of grade marking considers that if a student gets lower scores in one or two terms, it creates a shared belief between the students and the teacher that the student lacks high learning skills or is not intelligent enough. Also, a study conducted by Mussawy (2009) revealed that a shared understanding exist among teachers in relation to the man purpose of authentic assessment which is to improve instruction and increase learning.

Assessment tasks and strategies

Fox and Soller (2001), in their study on authentic assessment strategies and tools employed by teachers in Malawi found out that students in lower classes prefer working collaboratively using projects, computer-based

simulation task, storytelling and demonstrations while students in upper classes also demonstrated high level performance in working competitively using writing samples, performance products, and graphic organizers. It was also revealed in the study that education systems that emphasize tests and examinations put some student at a disadvantage (Mbano, 2003; Nampota & Wella, 1999).

Fook and Sidhu (2010) conducted a study in Malaysia to investigate the different types of authentic assessment used in higher education in Malaysia. The study employed a qualitative research method and involved the use of instruments such as interview, document analysis and classroom observations to collect relevant data in the classroom. The researchers identified that different types of authentic assessment were used. The study revealed that teachers employed the following assessment tools; portfolio (10%), article review (10%) performance product (20%), project (40%) and test (20%). The findings indicated that alternative and authentic assessment have more acceptances from students and should, therefore, be viewed as an alternative to traditional standardized assessment. The study again revealed that assessment practices in some subject areas like Mathematics, Science and Social Studies indicated favorable emphasis being given to formative assessment because 80% of the total marks have been allocated to on-going assessment and 20% was for the test. Moreover, students interviewed also agreed that project and portfolio assignment given were to a great extent real and authentic tasks that they could relate to their future workplace.

Beckmann, Senk and Thompson (1997) studied the assessment and grading practices of 19 high school mathematics teachers in the United States.

Their study revealed that the most frequently used assessment tools were tests and quizzes and these determined about 77% of students' grades. Twelve of the nineteen teachers used other forms of assessment such as written projects, experiments, demonstrations or interviews with students. The study also revealed that teachers recorded a very high level of student participation in the written projects, experiments.

Challenges of using authentic assessment

Eshun et al. (2014) conducted a study to investigate the influence of authentic assessment on classroom practices of teachers and the challenges they encounter in the Social Studies classroom in Ghana. The study used a descriptive case study design and it involved 10 senior high schools and twenty teachers randomly sampled from fifty-seven (57) senior high schools in the Central Region of Ghana. Semi-structured interview guide was the main instrument used for data collection. The research found out that the forms of authentic assessment some teachers used in their classrooms were limited due to examination policies, time, resources and assessment methods employed by their schools. Furthermore, they revealed that most teachers they observed were not using assessment techniques that involved students in the teaching and learning process. Again, they indicated that some teachers revealed that using the authentic assessment would delay them in completing topics in their syllabuses given to them.

Beckmann, Senk and Thompson (1997) in their study conducted in USA identified three reasons why teachers do not use multiple assessment methods. First, some teachers had limited knowledge of different forms of assessment. Second, teachers felt they had no time to create/develop authentic

assessment. Third, teachers felt there was little or no professional guidance; therefore, teachers were not confident enough to try out authentic assessments.

Summary of Related Literature

This chapter dealt with theories, concepts and research findings that support the use of authentic assessment. Numerous researches have been carried out by various researchers on the perception and the practice of authentic assessment, challenges of using authentic assessment and authentic assessment tasks among others.

Researchers have attempted to investigate teachers' perceptions of authentic assessment in many different ways (Chester & Quilter, 1998). Chester and Quilter believed that studying teachers' perceptions of authentic assessment is important in the sense that it provides an indication of how different forms of authentic assessment are being used or misused and what could be done to improve the situation. A research conducted by Panizzon and Pegg (2007) found out that all teachers who participated in a study represented a change in their perception enabling them use collaborative effort to engage students' understanding in their classrooms. It was also revealed in the literature that teachers who attached less value to classroom assessment used standardized tests most of the times in their classrooms than authentic assessment (Chester & Quilter, 1998). In the same way teachers with negative experiences in alternative assessment are least likely to see the value in various forms of assessment for their classroom. Furthermore, a study conducted by Kentucky Department of Education (1991) also reveal that teachers have high perception of authentic assessment and they long for an assessment that relies on more than just written problems that could capture

the more diverse skills visible in their classroom and valued in the workplace, such as artistic talent, computer survey, and the know-how to diagnose and fix problems with mechanical devices.

With regard to authentic assessment practices, research works of other researchers were reviewed and it was revealed after a training programme organized by Shepard et al. (1995) showed that students had opportunities to develop their mathematical understandings that had not occurred previously, the participating students in the study again showed specific improvements in their performance that could be associated with the project. McMillan, Myran and Workman (2002) in their study found out that teachers were mostly interested in assessing students' mastery or achievement and that performance assessment was used frequently. Again, it was reviewed of the literature that teachers set more intellectually demanding tasks and students were more likely to generate work or artifacts judged to be of high quality (McMillan, Myran & Workman, 2002).

A review of the literature also, showed that teachers teaching students in lower classes prefer working collaboratively using projects, computer-based simulation task, storytelling and demonstrations while students in upper classes also demonstrated high level performance in working competitively using writing samples, performance products, and graphic organizers (Fox & Soller, 2001). Also, a research finding of Fook and Sidhu (2010) indicated that different types of authentic assessment were used by teachers in Malaysia. The study revealed that teachers employed the following assessment tools; portfolio (10%), article review (10%) performance product (20%), project (40%) and test (20%). Moreover, students interviewed also agreed that project

and portfolio assignment given were to a great extent real and authentic tasks that they could relate to their future workplace They further recommend that alternative and authentic assessment have more acceptances from students and should, therefore, be viewed as an alternative to traditional standardized assessment.

The literature reviewed the research works on challenges of using authentic assessment and it was revealed that the forms of authentic assessment some teachers used in their classrooms were limited due to examination policies, time, resources and assessment methods employed by their schools (Eshun et al., 2014). Beckmann, Senk and Thompson (1997) also revealed in their study that (1) some teachers had limited knowledge of different forms of assessment (2) teachers felt they had no time to create/develop authentic assessment and (3) teachers felt there was little or no professional guidance; therefore, teachers were not confident enough to try out authentic assessments.

There is enough evidence based on the literature suggesting a clear indication of what educators are expected to do concerning the perception and the practice of authentic assessment and the relevance of authentic assessment on students learning.

CHAPTER THREE

RESEARCH METHODS

This chapter focuses on the research methods used in the study. It describes the research design, population, sample and sampling procedures, and procedures for data collection and analysis of data.

Research Design

According to Sarantakos (2005), research design is the prescription of the logical sequence in which a study is to be carried out, as well as the elements of the study, its methods of data collection and analysis and administrative procedures that need to be considered for the study to be carried out without problems or delays.

There are many research designs, but for the purpose of this study, the descriptive research design was used. This study is a descriptive survey design. The choice of research design for a particular study is based on the purpose of the study according to the views of Cohen, Manion & Morrison (2007). Since this study sought to find out the current perceptions and practices of Senior High School teachers on authentic assessment, survey design, was used for the study. The survey design according to Alonge (1989), involves collecting data to assist the researcher to answer the research questions formulated about the problem. It is, therefore, best for this study because its aim is to provide accurate quantitative information about certain designated characteristics such as opinions and perceptions of the population under study. In this regard, it enabled the researcher to ascertain respondents'

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perceptions on the current authentic assessment practices for easy description of the situation and to make intelligent recommendations to improve the situation. Fraenkel and Wallen (2003) also stated that obtaining answers from a large group of people to a set of carefully designed and administered questions, lies at the heart of survey research.

The investigator chose this approach because she was interested in learning about the meaning of authentic assessment and authentic tasks from teachers' perspective. She was also interested in investigating the experience of the teachers in relation to authentic assessment practices in the Senior High Schools in the Cape Coast Metropolis.

The major advantage that goes with this type of design is that, the data collection techniques present several advantages as they provide a multifaceted approach for data collection. For example, a survey can provide statistics about an event while also illustrating how people experience that event (Murphy, 1994). Again, he states that the descriptive research design also offers a unique means of data collection thus it provides more accurate picture of events and seeks to explain people's perceptions and behaviour on the basis of data gathered at a point in time (Murphy, 1994). However, the design has some weaknesses. Confidentiality is the primary weakness of descriptive research (Murphy, 1994). According to Murphy (1994), respondents are often not truthful as they feel the need to tell the researcher what they think the researcher wants to hear and also participants may refuse to provide responses they view to be too personal. Another weakness of this design, according to Murphy (1994) is that it presents the possibility for error and subjectivity. However, the design was used despite its weaknesses because

it seeks to explain people's perceptions and behaviour on the basis of data gathered at a point in time and can provide statistics about an event while also illustrating how people experience that event thus providing a multifaceted approach for data collection.

Study Area

The study was undertaken in the Cape Coast Metropolis in the Central Region of Ghana. The Cape Coast Metropolis has a total estimated population of 169,894. The area is bordered to the north by Abura-Asebu Kwamankese District, Mfantseman District to the east, Komenda-Edina- Eguafo -Abram District to the west and it is bordered by the Gulf of Guinea at the south. The Cape Coast Metropolis has ten public senior high schools with teacher population of eight hundred and fifty eight (858).

Cape Coast has been described as the cradle of education in the Central Region by all and sundry (Gyesi & Addo, 2014). According to them, many scholars trained by the early Europeans in the Gold Coast in the 18th Century started their education in Cape Coast. Notably among them were John Mensah Sarbah and Philip Quacoe who were natives of Cape Coast. The first Secondary School; Mfantsipim school, was established also in Cape Coast in 1876 (Gyesi & Addo, 2014). . Furthermore, five of Ghana's best Senior High Schools which have been categorized by the Ghana Education Service as category A schools are found in Cape Coast.

Population

Nitko (2004) defined a population as the entire aggregation of cases that meet a designated set of criteria. The population for the study comprised all tutors of the ten (10) public Senior High Schools in the Cape Coast

Metropolis totaling 858. But the accessible population is all tutors in seven public Senior High schools totaling 550. The schools that formed the accessible population were St Augustine's Senior High School, Adisadel Senior High School, Holy Child Senior High School, Ghana National Senior High School, Ogua Secondary Technical, Academy of Christ the King Senior High School and Efutu Senior High School. The Cape Coast Metropolis has ten (10) public Senior High Schools which fall into categories A, B and C. The categorization was done by the Ghana Education Service (GES) based on availability of resources / facilities, teaching and non-teaching staff and teaching / learning materials. The purpose of the categorization is to ensure that all Senior High Schools in Ghana have equal opportunities and fair share of resources, staffing and teaching / learning materials. Again, the categorization is also to ensure that Senior High Schools have adequate number of students' population to utilize the available resources effectively and efficiently.

 Sampling Procedure

Sarantakos (2005) postulated that a sample consists of a carefully selected unit that comprises all the categories of the population. Sarantakos (2005) indicates that estimation of the sample size varies significantly, with some researchers showing interest in pure quantity, others in quality and yet others combining in what is called triangulation of sources, data and methods. However, a wise rule is that the sample size must be as large as necessary, and as small as possible.

According to Ary, Jacobs and Razavieh (as cited in Amandi, 2008), sampling is indispensable to the researcher because it is sometimes virtually

impossible to use the entire population for a research. However, many researchers use different sampling methods to determine the sample size based on a given confidence level of precision required (Israel, 1992). The general notion of researchers, however, is that, the larger the sample size, the smaller the sampling errors. But Best and Khan (1998) asserted that sample size depends on the nature of the population, the data to be gathered, the analysis to be done and the funds available for the study.

A sample size of two hundred and twenty-six (226) respondents was used for the study based on the table for determining sample size from a given population by Krejcie & Morgan (as cited in Sarantakos, 2005). The study used four sampling techniques considering the nature of the population and the sample size. These are stratified sampling, purposive sampling, simple random sampling and proportional stratified sampling.

The researcher used stratified sampling technique and the strata groups were the category of schools; Category "A": (St Augustine's Senior High School, Adisadel Senior High School, Holy Child Senior High School, Mfantsipim Senior High School, Wesley Girls' Senior High School) Category "B":(University Practice Senior High School, Ghana National Senior High School, Ogua Secondary Technical) and Category "C": (Academy of Christ the King Senior High School, Efutu Senior High School) of public schools already formed by the GES. The categorization was based on the availability of resources / facilities, teaching and non-teaching staff and teaching / learning materials in the schools.

Simple random sampling was used to select three schools from Category "A" and two from Category "B" but the schools in Category "C"

were purposively selected. Purposive sampling technique is a non-probability technique used when the researcher builds up a sample likely to satisfy certain specific needs (Cohen et al., 2007). The techniques ware employed to give fair chance to all the schools. With the simple random sampling, the researcher first designed a sample frame by listing all the names of all the schools in Categories "A" and "B' on a sheet and then she cut the names of the schools out from 1- 5 for Category "A" and 1-3 for Category "B". The researcher put the cut out papers bearing the names of the schools in Categories "A" and "B" in two separate containers. The cut out papers in each of the containers were then mixed up and were removed randomly from each container one at a time without looking into the containers. The researcher recorded the names of the schools on the papers selected in turns from each container and when a paper was selected and recorded it was thrown back into the containers before the next one was picked. The process continued until three schools were selected from the container with the Category "A" schools and two schools were also selected from the container with Category "B" schools. The schools selected from Category "A" were St Augustine's Senior High School, Wesley Girls' Senior High School, Adisadel Senior High School. The schools selected from Category "B" were Ogua Secondary Technical, Ghana National Senior High School and the researcher used all the schools in Category "C" because that category has only two schools. The schools in Category "C" were Academy of Christ the King Senior High School and Efutu Senior High School. The researcher used seven schools out of the ten public Senior High Schools in the Cape Coast Metropolis by the researcher's judgment of how useful they would be for the study. In all seven schools were used.

Proportional stratified random sampling was used to obtain the sample size for each school. A proportion for the sample was calculated by using the number of tutors in each Senior high School dividing that number by the total population of tutors in all the seven selected schools and was multiplied by the sample size given based on the table for determining sample size by Krejcie & Morgan.

This was done proportionately as shown in Table 1.

Table 1: *Quota Assigned to the Senior High Schools under Study*

Senior High School	No. of Tutors	Sample
St Augustine's Senior High School	83	34
Holy Child Senior High School	67	28
Adisadel Senior High School	100	41
Ogua Secondary Technical	65	27
Ghana National Senior High School	105	43
Academy of Christ the King Senior High School	68	28
Efutu Senior High School	62	25
Total	550	226

Source: Field survey, Attom (2016)

In selecting the actual respondents from the Science, General Arts and Business departments for the study, convenience sampling was used to select two hundred and sixty-six (266) participants for the study. This sampling method was considered as the most appropriate because it was difficult to convince teachers to respond to the questionnaire because of their busy schedule. Therefore, the researcher visited the Senior High Schools and after

introducing herself and the purpose of the study to the teachers, she pleaded for the voluntary participation of the study.

Data Collection Instruments

The research instruments used for the study were designed by the researcher. Questionnaire was used for the study because it offered the researcher the opportunity to sample the perceptions of a larger population. The items on the questionnaire were prepared based on the objectives of the study to elicit the needed information. The questionnaire included both close-ended items. The close-ended items used for the study were on a 4-point Likert scale type. The Likert scale consisted of a four point type which involved using "Strongly Agree, Agree, Disagree or Strongly Disagree". Likert scale was considered by the researcher because it has the added advantage of being relatively easy to develop. It also builds in a degree of sensitivity and differentiation of response while still generating numbers. Though Likert scales are powerful and useful in research, the researcher is not oblivious of its limitations. For instance, there is no assumption of equal intervals between the categories, hence a rating of four indicates neither that it is twice as powerful as two nor that it is twice as strongly felt. Also, the researcher cannot check on whether the respondents are telling the truth since some respondents may be deliberately falsifying their responses. Also, in using a Likert scale, the researcher has no way of knowing if the respondents might have wished to add any other comments about the issue under investigation.

A questionnaire was used for the study because it offered the researcher the opportunity to sample the perceptions of a larger population. It

also provides large amounts of data in a short period of time at relatively low cost. Participants can also be assured of anonymity and so they may be more truthful in responding to the items. The researcher identified the key issues relating to the perception and practices of authentic assessment and developed questionnaire to gather data for the study.

The questionnaire was in four sections. Section A was on personal data of respondents such as age and gender, subject(s) and class(es) taught, Section B was on teachers' perception of authentic assessment, Section C was on practices of authentic assessment, Section D solicited for how teachers use authentic assessment result, section E was on kinds of authentic assessment Senior High School teachers use to assess their students and section F was on challenges teachers encountered in the use of authentic assessment during teaching and learning in the classroom.

Validity and reliability are essential to the effectiveness of any data gathering procedure (Best & Khan, 1998). Validity is the appropriateness, meaningfulness and usefulness of specific inference made from the instrument and reliability is the degree of consistency that the instrument or procedure demonstrates (Best & Khan, 1998). The focus of validity is not on the instrument itself but on the interpretation and meaning of the scores derived from the instrument (Ary, Jacobs & Razavieh, 2002). To ascertain the content validity, the items constructed for the instrument were shown to senior members in the Department of Education and Psychology, University of Cape Coast including the supervisors. This was to examine: (a) whether they were related to the research questions; (b) whether they would elicit the appropriate responses from the respondents; (c) whether the vocabulary structure was

appropriate; (d) whether the items were properly arranged; (e) if items fitted into sections they had been placed in; and (g) whether any of the items were ambiguous and misleading. The suggestions they gave were used to improve the instrument and thereby helped to establish the face and content validity.

O'leary (2004) described reliability as related to internal consistency. Internal consistency meant that data collected, measured or generated remained the same under expert trials. It was, therefore, necessary to ensure that research instruments were reliable incase the research method was repeated elsewhere in different samples. Therefore, reliability was ensured through pre-testing.

The research instrument was pre-tested using a group of thirty (30) Senior High School teachers who were randomly selected from Edinaman and Komenda Senior High Schools in the Komenda-Edina- Eguafo –Abrem district (KEEA) in the Central Region to fill the questionnaire as a pre-testing of the instrument. An introductory letter explaining the purpose of the study, soliciting co-operation of respondents and assuring them of confidentiality of information was sent to the head teachers of the institution for their consent and permission. As they completed the questionnaire they were asked some questions to ascertain their understanding of the items. The responses of the pre-testing revealed the difficulty level and ambiguities in the interpretation of each item.

Cronbach's alpha was used by the researcher to estimate the reliability of the instrument after the pre-test. The Cronbach's alpha coefficient for the pre-testing was 0.86. According to Pavet, Deiner, Colvin, and Sandvik (1991), in terms of reliability, an instrument is considered to have a good

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internal consistency, if a Cronbach's alpha coefficient of .85 is obtained. Pavet et al. (1991) again argue that any scale with Cronbach's alpha of less than 0.7 cannot be considered reliable. On the basis of this the value of .86 is above 0.7, so the scale can be considered reliable.

The purpose of the pre-testing, according to Oppenheim (1999), Wilson and McLean (as cited in Cohen, Manion and Morrison, 2007) was to increase the validity and reliability of the questionnaire. Cohen, Manion and Morrison (2007) opine that pre-testing involves checking for clarity of items, instructions and layout as well as to gain feedback on the questionnaire. Additionally, piloting fosters the elimination of ambiguities or difficulties in wording.

The pre-testing was essential because it helped the researcher to know the internal consistency of the instrument and also helped to reshape and restructure the items. For instance, it enabled the researcher to identify and correct few ambiguities like clarity of expression and overloaded questions. It also enabled the researcher to identify and correct some research questions that were wrongly formulated and could have given some unintended results.

Data Collection Procedure

A letter of introduction was collected from the Department of Education and Psychology, University of Cape Coast, to seek for permission from the Head teachers of the seven public Senior High Schools in the Cape Coast Metropolis. The questionnaires were administered by the researcher to two hundred and twenty-six (226) tutors selected from the seven public Senior High Schools in the Cape Coast Metropolis.

At each Senior High School, the respondents were met at their Staff Common Room during their lunch time where most of the teachers meet to take their lunch. A brief self-introduction was made by the researcher to explain the purpose of the study to the respondents before the questionnaires were distributed to them. The researcher stayed with them and had interactions with them. This motivated the respondents to attend to the questionnaire and also asked for further clarifications on some of the items they needed more information on. The researcher appealed to all the respondents to take their time to read the questionnaire and respond to it appropriately. The researcher visited the selected Senior High Schools at different times and distributed the questionnaires to the respondents. The researcher went to the schools the next day to collect the questionnaires. In all, 226 questionnaires were administered to the respondents. However, the researcher was able to retrieve 211 questionnaires, representing 93.36% returns.

Data Processing and Analysis

In every research, data collected becomes meaningful only when it is organized and summarized. This study adopted the survey design and as a result descriptive statistics (frequencies and percentages) and inferential statistics (one sample t-test and ANOVA) were used to analyze the data collected. Ary, Jacobs & Razavieh (2002) noted that researchers use descriptive statistics to organize, summarize, interpret and communicate information obtained. Specific questions were formulated to allow for the investigation of the research problem. The questionnaires were coded, edited and categorized.

Research Question One:

What are the perceptions of public Senior High Schools teachers on authentic assessment?

Research question one sought to find out from respondents their perception of authentic assessment.The responses of participants were measured using twelve statements and the activities were on a four-Likert scale as, 'Strongly disagree' (1), 'Disagree' (2), 'Agree' (3), and 'Strongly agree' (4). The overall score for each person and the overall mean were computed. Moreover, a one sample t test was conducted to establish which items were significant. The test value used was 2.5.

Research Question Two:

How do Senior High School teachers practice authentic assessment?

Research question two sought to find out from respondents how they practiced authentic assessment. The responses of participants were measured using sixteen statements and the activities were on a four-Likert scale as, 'Never' (1), 'Occasionally' (2), 'Most of the time' (3), and 'Always' (4). The overall score for each person and the overall mean were computed. A one sample t test was conducted to establish which items were significant. The test value used was 2.5.

Research Question Three:

How do teachers in the Senior High Schools use authentic assessment results?

Research question three sought to find out from respondents how they used authentic assessment results. The responses of participants were obtained using ten statements and the activities were on a four-Likert scale as, 'Strongly disagree' (1), 'Disagree' (2), 'Agree' (3), and 'Strongly agree' (4).The overall

score for each person and the overall mean were computed. A one sample t test was conducted to establish which items were significant. The test value used was 2.5.

Research Question Four:

What kinds of authentic assessment tasks/tools do Senior High School teachers use to assess their students' learning outcomes?

Research question four sought to find out from participants the kinds of authentic assessment tasks/strategies they used to assess their students' learning outcomes. The responses of participants were obtained using twelve statements and the activities were on a four-Likert scale as, ''Never' (1), 'Occasionally' (2), 'Most of the time' (3), and 'Always' (4). The analysis of the responses was then presented in a frequency and percentage table.

Research Question Five:

What challenges do teachers have in the use of authentic assessment in their various subjects?

Research question five sought to find out from respondents challenges they have in the use of authentic assessment in their various subjects. The responses of participants were obtained using ten statements and the activities were on a four-Likert scale as, 'Strongly disagree' (1), 'Disagree' (2), 'Agree' (3), and 'Strongly agree' (4). The responses were then categorized into two main divisions: ''Agree'' and ''Disagree''. The analysis of the responses was then presented in a frequency and percentage table.

Hypothesis One

Hypothesis one sought to test whether a significant difference exists among the three departments namely (a) Science, (b) General Arts and (c) Business in the use of authentic assessment result. The analysis of the responses was tested using Kruskal-Wallis H test for the difference.

Hypothesis Two

Hypothesis two tested whether a significant difference exists within the Categories of schools. The one-way ANOVA was used to test for the difference within the Categories of schools.

Chapter Summary

The researcher used descriptive survey design for the study to find out current perceptions and practices of Senior High School teachers on authentic assessment. The study was carried out in the Cape Coast metropolis in the Central Region of Ghana. The researcher used seven Senior High Schools out of the ten Senior High Schools and a sample size of 226 was obtained using purposive, stratified, simple random and quota sampling techniques. An instrument (questionnaire) was designed by the researcher and was used to gather the necessary information needed for generalization. The researcher trial-tested and validated the instrument before she administered it. The data collected was analyzed using percentages, frequencies, one-sample t test, Kruskal Wallis H test and one-way analysis of variance (ANOVA)

However there were some limitations encountered by the researcher as she carried out the study. The major limitation of the study was the unenthusiastic attitude of teachers toward research work and especially

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completing of questionnaires. This resulted in 211 of the questionnaires being retrieved which represented 93.36% of the 226 questionnaire distributed.

In the ideal situation, a nationwide study is required. This would have given much confidence to any generalisations made. The time for the study and the resources available, however, made this impracticable. Hence, the selection of the seven government assisted Senior High Schools in the Cape Coast Metropolis of Ghana.

Not all the departments in the Senior High Schools were included in the study. This is because the department are so many and that time and resources available would have been a hindrance to the inclusion of all of them in the study. In view of this, General Arts, Science, and Business were considered for the study. The fewer number of departments at the Senior High Schools that were used for the study might affect generalization to the whole Senior High School teachers.

CHAPTER FOUR

RESULTS AND DISCUSSION

The study investigated the perception and practices of public Senior High School teachers of authentic assessment. It was also to find out the extent to which public Senior High School teachers practice authentic assessment in their assessment procedure. Specifically, the study focused on the following: (a) investigated the perceptions of public Senior High School teachers on authentic assessment, (b) found out the kinds of authentic assessment tasks / strategies Senior High School teachers use to assess their students' learning outcomes, (c) investigated the challenges teachers encounter in the use of authentic assessment in their various subjects and (d) investigated how Senior High School teachers use authentic assessment.

This chapter presents the results of the analyses and discussion of the findings of the study. The data were analyzed through frequencies and percentages, one sample t test and one-way analysis of variance (ANOVA)

Demographic Data of Respondents

The study was carried out in the Cape Coast Metropolis in the Central Region of Ghana, with a sample size of 211. The number of respondents from Efutu Senior High School, Adisadel Senior High School, Holy Child Senior High School, Ogua Secondary Technical, St Augustine's Senior High School, Ghana National Senior High School and Academy of Christ the King Senior High School were 23, 39, 28, 25, 31, 39 and 26 respectively.

Distribution of respondents by gender

Table 3 presents the distribution of respondents by gender

Table 3- *Distribution of Respondents by Gender*

Gender	Frequency	Percentage (%)
Male	119	56.4
Female	92	43.6
Total	211	100.0

Source: Field survey, Attom (2016)

From Table 3, the majority 119 (56.4%) were males while 92 (43.6%) were females.

Distribution of respondents by rank

Table 4 presents distribution of respondents by rank

Table 4- *Distribution of Respondents by Rank*

Rank	Frequency	Percentage (%)
Teacher	44	20.9
Assistant Superintendent	2	.9
Superintendent	4	1.9
Senior Superintendent	6	2.8
Principal Superintendent	95	45.0
Assistant Director II	53	25.1
Assistant Director I	7	3.3
Total	211	100.0

Source: Field survey, Attom (2016)

From Table 4, the majority 95 (45.0%) were principal superintendents. This is followed by assistant director II, with 53 (25.1%) while 44 (20.9%)

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were also teachers. It is worth noting that only few assistant superintendents 2 (.9%) and superintendents 4 (1.9%) participated in the study.

Distribution of respondents by place work

Table 5 presents the distribution of respondents by place of work

Table 5- *Distribution of Respondents by Place of Work*

Place of work	Frequency	Percentage (%)
St. Augustine's Senior High School	31	14.7
Holy Child Senior High School	28	13.3
Adisadel Senior High School	39	18.5
Ogua Secondary Technical	25	11.8
Ghana National Senior High School	39	18.5
Academy of Christ the King Senior High School	26	12.3
Effutu Senior High School	23	10.9
Total	211	100.0

Source: Field survey Attom (2016)

Table 5 shows that, 39 (18.5%) each were teaching at Adisadel Senior High School and Ghana National Senior High School. Also, 31 (14.7%) were teaching at St. Augustine's Senior High School, 28 (13.3%) were teaching at Holy Child SHS, 26 (12%) were teaching at Academy of Christ the King Senior High School, 25 (11.8%) were teaching at Ogua Secondary Technical while the minority 23 (10.9%) were teaching at Effutu Senior High School.

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Distribution of respondents by department

Table 6 presents the distribution of respondents by department

Table 6- *Distribution of Respondents by Department*

Department	Frequency	Percentage (%)
General Arts	110	52.1
Science	65	30.8
Business	36	17.1
Total	211	100.0

Source: Field survey, Attom (2016)

From Table 6, the majority, 110 (52.1%) were in the General Arts department, followed by 65 (30.8%) with the Science department. The study, therefore, showed that a greater proportion of the respondents were in General Arts department. This was due to the fact that the General Arts department had the highest teacher population in four out of the seven schools used for the study.

Distribution of respondents by class they teach

Table 7 presents the distribution of respondents by the class they teach.

Table 7-*Distribution of Respondents by Class they Teach*

Class	Frequency	Percentage (%)
Form one only	15	7.1
Form two only	63	29.9
Form three only	32	15.2
Form one and two	38	18.0
Form one and three	9	4.3
Form two and three	30	14.2
All the Forms	24	11.4
Total	211	100.0

Source: Field survey, Attom (2016)

From Table 7, the majority 63 (29.9%) taught Form two class only, followed by Form one and two with 38 (18.0%) while Form one and three had 9 (4.3%).

Distribution of respondents by qualification

Table 8 presents the distribution of respondents by qualification

Table 8- *Distribution of Respondents by Qualification*

Qualification	Frequency	Percentage (%)
B.Ed	179	84.8
BA or BSc.	32	15.
Total	211	100.0

Source: Field survey, Attom (2016)

From Table 8, the majority 179 (84.8%) were Bachelor of Education degree holders while 32 (15) were Bachelor of Art or Bachelor of Science degree holders. It is clearly seen that more Bachelor of Education degree holders participated in the study.

Distribution of respondents by years of teaching

Table 9 presents the distribution of respondents by years of teaching

Table 9- *Distribution of Respondents by Years of Teaching*

Years	Frequency	Percentage (%)
2-5 years	107	50.7
6-10 years	76	36.0
11-15 years	23	10.9
16 years and above	5	2.4
Total	211	100.0

Source: Field survey, Attom (2016)

From Table 9, the majority 107 (50.7%) have taught for 2 to 5 years, 76 (36.0%) have taught for 6 to 10 years, 23 (10.9%) have taught for 11 to 15

years while 5 (2.4%) have taught for 16 years and above. It can be seen from the study that majority of the respondents have taught for 2 to 5 years.

Research Question One

What are the perceptions of public Senior High Schools teachers on authentic assessment?

Research question one sought to find out from participants their perception of authentic assessment. The responses of participants were measured using twelve statements and the activities were on a four-Likert scale as, 'Strongly disagree' (1), 'Disagree' (2), 'Agree' (3), and 'Strongly agree' (4). Table 10 presents the result of one sample t test of teachers' perception of authentic assessment. A cut-off point value of 2.5 was used as the criterion measure. The cut-off point was obtained by adding all the values of the four-Likert scale and dividing it by 4 since the Likert scale has four scales.

Table 10- *Analysis of Result of One Sample t test of Teachers' Perception of Authentic Assessment*

Items	N	M	SD	t	df	*P*
1. Authentic assessment requires students to construct an original response rather than choose from a list of possibly correct answers.	196	3.17	.53	17.61	195	.000
2. Authentic assessment tasks foster higher order thinking.	196	3.37	.59	20.41	195	.000
3. Authentic assessment assesses the process of creating final product directly.	196	3.21	.63	15.65	195	.000
4. Authentic assessment requires a collaborative effort to solve problems.	196	3.38	.61	20.21	195	.000
5. Authentic assessment assesses projects.	196	3.14	.59	15.24	195	.000
6. Authentic assessment requires students to learn to evaluate their own work using predetermined criteria during authentic assessment.	196	3.27	.69	15.64	195	.000
7. Authentic assessment uses student work which has been collected over time.	196	3.10	.59	14.27	195	.000
8. Authentic assessment is based on clear criteria given to students.	196	3.21	1.49	6.65	195	.000
9. Authentic assessment allows for a particular task to yield multiple scores in different content domains.	196	3.09	.65	12.45	195	.000
10. Authentic assessment requires evaluation of changes in performance over time.	196	3.29	.61	17.85	195	.000
11. Authentic assessment requires students to incorporate information from many areas.	196	3.18	.61	15.60	195	.000
12. Authentic assessment reflects students' competencies in applying their knowledge and cognitive skills to solve substantive, meaningful tasks.	196	3.41	.58	22.05	195	.000

Source: Field survey, Attom (2016)

Table 10 showed that generally, teachers in the senior high schools have positive perception about authentic assessment. This is evident that the scores were all above the cut-off point (2.5), therefore, the result was significant.

The major items are: (1) authentic assessment tasks foster higher order thinking (M=3.37) (2) authentic assessment assesses the process of creating final product directly (M=3.21) (3) authentic assessment requires a collaborative effort to solve problems (M=3.38) (4) authentic assessment requires students to learn to evaluate their own work using predetermined criteria during authentic assessment (M=3.27) (5) authentic assessment is based on clear criteria given to students (M=3.21) (6) authentic assessment requires evaluation of changes in performance over time (M=3.29) (7) authentic assessment reflects students' competencies in applying their knowledge and cognitive skills to solve substantive, meaningful tasks (M=3.41).

Table 11 presents the overall mean score for respondents' perception of authentic assessment

Table 11- *Analysis of Results of Overall One Sample t-Test for Respondents' Perception of Authentic Assessment*

	Test value = 30					
Perception	N	M	SD	T	df	Sig.
	196	38.7	4.06	30.45	195	.000

Source: Field survey, Attom (2016)

With regard to the perception of authentic assessment by teachers, the overall perception mean score was 38.7. A test value of 30 was obtained by multiplying the 12 items by the cut-off point (2.5). The test value which is 30 was then compared with the overall mean score (38.7) for teachers' perception of authentic assessment. The overall mean score (38.7) for respondents' perception of authentic assessment is greater than the test value which is 30. This implies that respondents' perception of authentic assessment is above average (high).

Research Question Two

How do Senior High School teachers practice authentic assessment?

The study sought to find out from participants the practices of authentic assessment. The responses of participants were measured using sixteen statements and the activities were on a four-Likert scale as, 'Always' (4), 'Most of the time' (3), 'Occasionally' (2), and 'Never' (1). Table 12 presents the result of one sample t test of teachers' practices of authentic assessment. A cut-off point value of 2.5 was used as the criterion measure. The cut-off point was obtained by adding all the values on the Likert scale and dividing it by 4 since the Likert scale has four points.

Table 12- *Analysis of Result of One Sample t test of Practices of Authentic Assessment*

Statement	N	M	SD	t	df	*P*
1. I guide students to effectively translate issues and situations into meaningful tasks that have a clear purpose.	211	3.03	.66	11.78	210	.000
2. I ask students to write simple sentences expressing a complete thought	211	2.89	.84	6.80	210	.000
3. I ask students to create and organize ideas with a purpose	211	3.00	.78	9.42	210	.000
4. I ask students to use symbols and words to show meaning	211	2.75	.78	4.73	210	.000
5. I assist students to collaborate to create editorials, reports, recipes etc.	211	2.69	.91	2.98	210	.000
6. I assist students to prepare criteria for assessing their own project.	211	2.62	.83	2.11	210	.000
7. I guide students to apply their knowledge to real life problems.	211	3.21	.69	14.85	210	.000
8. I ask students to demonstrate their ability to organize ideas effectively	211	3.11	.72	12.47	210	.000
9. I guide students to use hands-on tasks to conduct several investigations	211	2.90	.80	7.15	210	.000
10. I ask students to provide explanations for their responses.	211	3.36	.63	17.55	210	.000
11. I assist students to add supportive details to stories	211	2.82	.92	5.03	210	.000
12. I ask students to co-operate with peers and school personnel	211	3.45	2.98	4.64	210	.000
13. I ask students to reflect on their learning process to take control of their learning	211	3.23	.66	16.05	210	.000

14. I assist students to communicate meaning through pictures	211	2.85	.91	5.63	210	.000
15. I assist students to demonstrate and extend their understanding about number meaning	211	2.95	.89	7.26	210	.000
16. I make informal observation about how students are responding to instruction	211	3.09	.79	10.84	210	.000

Table 12 showed that teachers in the selected senior high schools practiced authentic assessment. The result from the test indicated all scores were above the cut-off point (2.5) hence significant. The major items are: (1) "I guide students to effectively translate issues and situations into meaningful tasks that have a clear purpose as most of the time" (M=3.03) (2) "I ask students to write simple sentences expressing a complete thought" (M=2.89) (3)"I ask students to create and organize ideas with a purpose" (M=3.00) (4) "I guide students to apply their knowledge on real life problems" (M=3.21) (5) "I ask students to demonstrate their ability to organize ideas effectively" (M=3.11) (6) "I guide students to use hands-on tasks to conduct several investigations" (M=2.90) (7) "I asked students to provide explanations for their responses" (M=3.36) (8) "I ask students to co-operate with peers and school personnel" (M=3.45) (9) "I ask students to reflect on their learning process to take control of their learning" (M=3.23) (10) "I assist students to demonstrate and extend their understanding about number meaning" (M=2.95) (11) "I make informal observation about how students are responding to instruction" (M=3.09).

Table 13 presents the overall mean score for respondents' practice of authentic assessment

Table 13- *Analysis of Results of Overall One Sample t-Test for Respondents'*

Practice of Authentic Assessment

Practice	Test value = 40					
	N	M	SD	T	Df	Sig.
	211	47.6	7.48	15.260	210	.000

Source: Field survey, Attom (2016)

Table 13 gave the overall mean score of practice of authentic assessment 47.6. A test value of 40 was obtained by multiplying the 16 items by the cut-off point (2.5). The test value which is 40 was then compared with the overall mean score of 47.6 for teachers' practice of authentic assessment. The overall mean score for respondents' practice of authentic assessment is greater than the test value of 40. This implies that respondents' practiced of authentic assessment is good.

Research Question Three

How do Senior High School teachers use authentic assessment results?

The study sought to find out from participants how they used authentic assessment results. The responses of participants were obtained using ten statements and the activities were on a four-Likert scale as, 'Strongly disagree' (1), 'Disagree' (2), 'Agree' (3), and 'Strongly agree' (4). Table 14 presents the result of one sample t test of teachers' practices of authentic assessment. A cut-off point value of 2.5 was used as the criterion measure. The cut-off point

was obtained by adding all the values of the four Likert scale and dividing it

by 4 since the Likert scale has four points.

Table 14- *Analysis of Result of One Sample t test of Use of Authentic Assessment Results*

Statement	N	M	SD	t	df	P
1. Designing learning activities which are suitable for students.	211	3.30	.52	22.09	210	.000
2. Supporting in remedial teaching	211	3.21	.51	20.17	210	.000
3.Supporting and following up the students' development	211	3.38	.62	20.73	210	.000
4. Improving and developing teaching and learning	211	3.36	.62	19.46	210	.000
5. Helping administrators understand how groups of students are progressing	211	3.20	.71	14.51	210	.000
6.Helping parents understand more about their children's progress as learners	211	3.26	.61	18.05	210	.000
7. Helping students become more self-reflective and take control of their own learning	211	3.42	.61	21.96	210	.000
8. Helping students set their own goals to further their learning	211	3.34	.59	20.39	210	.000
9. Helping other teachers focus their instruction more effectively	211	3.19	.64	15.62	210	.000
10. Providing students the opportunity to make choices and reflect on their own learning both individually and socially.	211	3.28	.63	18.13	210	.000

From Table 14, the one sample t test result indicates that senior high school teachers used authentic assessment results. The test indicated significant results. These include: (1) teachers used result to design learning activities which are suitable for students (M=3.30) (2) they supported and followed up the students' development (M=3.38) (3) improving and developing teaching and learning (M=3.36) (4) helping students become more self-reflective and take control of their own learning (M=3.42) (5) helping students to set their own goals to further their learning (M=3.34) and (6) providing students the opportunity to make choices and reflect on their own learning both individually and socially (M=3.28).

Research Question Four

What kinds of authentic assessment tasks / tools do Senior High School teachers use to assess their students' learning outcomes?

Research Question four sought to find out the kinds of authentic assessment tasks/strategies Senior High School teachers used to assess their students' learning outcomes. To answer research question four, the respondents were made to answer a 10 item questionnaire constructed on four point Likert scale ranging from "Never (1), Occasionally (2) Most of the time (3) and Always (4)''. The responses were categorized into two main divisions: ''Never/Occasionally'' and ''Most of the time/Always''. The analysis of the responses was then presented in a frequency and percentage table. The data of responses on research question four was presented in Table 15.

Table 15- *Analysis of Result of Frequencies and Percentages of Kinds of Authentic Assessment Tasks/strategies Senior High School Teachers*

Used to Assess their Students' Outcomes

Authentic Assessment Tasks	Never/Occasionally		Most of the time/Always	
	Freq	(%)	Freq	(%)
1. Assessing work samples	49	23.3	162	76.7
2. Role-play	106	50.3	105	49.7
3. Constructed-Response Items	59	27.9	152	72.1
4. Experiments/Demonstration	62	29.4	149	70.6
5. Projects	110	52.1	101	47.9
6. Exhibitions	137	64.9	74	35.1
7. Writing Samples	82	38.8	129	61.2
8. Story Telling	100	47.4	111	52.6
9. Presentations	65	30.8	146	69.2
10. Drama	141	66.8	70	33.2
11. Report writing	103	48.9	108	51.1
12. Computer simulation task	148	70.2	63	29.8

Source: Field survey, Attom (2016)

From Table 15, (1) 162 (76.7%) indicated that they most of the time or always use work samples, regarding Constructed-Response Items, (2) 152 (72.1%) indicated that they most of the time or always use it. (3) 149 (70.6%) indicated that they most of the time or always use experiment/demonstration, (4) 146 (69.2%) use it most of the time/always. (5) 129 (61.2%) indicated that they most of the time/always use samples. On the other hand, the following tasks were used occasionally or never; (1) role play (2) storytelling (3) exhibitions (4) drama (5) report writing and (6) computer simulation tasks.

Research Question Five

What challenges do teachers have in the use of authentic assessment in their various subjects?

Research Question five sought to find out challenges teachers have in the use of authentic assessment in their various subjects. To answer research question five, the respondents were made to answer a 10 item questionnaire constructed on four point Likert scale ranging from "Strongly disagree (1), Disagree (2) Agree (3) and Strongly agree (4)''. The responses were then categorized into two main divisions: ''Agree'' and ''Disagree''. The analysis of the responses is presented in a frequency and percentage on Table 16.

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Table 16- *Analysis of Result of Frequencies and Percentages of Challenges Teachers face when Using Authentic Assessment*

Statement	Agree Freq	(%)	Disagree Freq	(%)
1. The school assessment system makes it difficult to use authentic assessment.	156	74.0	55	26.0
2. Lack of funds to undertake on some experiments and projects.	205	97.1	6	2.9
3. Lack of support from the school authorities in terms of logistics and facilities.	184	87.2	27	12.8
4. Lack of motivation from school authorities.	160	75.8	51	24.2
5. Developing authentic assessment task is difficult.	34	16.1	177	83.9
6. Inadequate time allotted on the timetable for various subjects does not permit the use of authentic assessment.	187	88.6	24	11.4
7. Inadequate time to prepare in terms of gathering information and materials to be used for authentic assessment.	168	79.6	43	20.4
8. Large class size makes it difficult to assess students using authentic assessment.	193	91.5	18	8.5
9. Some topics are difficult to assess using authentic assessment.	179	84.2	32	15.2

Source: Field. survey, Attom (2016)

Table 16 shows that, 205 (97.1%) indicated that they lack funds to embark on some activities and projects. This was followed by 193 (91.5%) who indicated that large class size makes it difficult to assess students using authentic assessment.

It was found that, 187 (88.6%) respondents indicated that they have inadequate time allotted on the timetable for various subjects which does not permit the use of authentic assessment. Again, 184 (87.2%) respondents indicated that they lacked support from the school authorities in terms of logistics and facilities whereas 179 (84.2%) agreed that some topics were difficult to assess using authentic assessment. The study, therefore, showed that respondents faced challenges when using authentic assessment.

Hypothesis One

Ho: There is no significant difference in the use of authentic assessment results among teachers in the major departments (Science, General Art and Business) of Senior High Schools in the Cape Coast Metropolis.

The purpose of the hypothesis was to find out whether a significant difference exist among the three departments namely (a) Science, (b) General Art and (c) Business in the use of authentic assessment results.

Table17- *Test of Normality*

| | Department | Shapiro-Wilk | | |
		Statistic	Df	Sig.
	General Art	.919	110	.000
Authentic assessment	Science	.886	65	.000
	Business	.855	36	.000

Source: Field survey, Attom (2016)

From Table 17, the result for "General Arts" "Science and "Business" group the dependent variable "Authentic assessment", was not normally distributed. This is because the Sig. values of the Shapiro-Wilk Test are less than 0.05.

Table 18- *Test of Homogeneity of Variances*

Levene Statistic	df1	df2	Sig.
6.752	2	208	.001

Source: Field survey, Attom (2016)

From Table 18, the sig. value of the Levene statistic is less than 0.05, therefore, variances are not assumed equal. Hence, Kruskal Wallis H test was used for the test.

Table 19- *Kruskal-Wallis H Test of Department in Schools in Terms of Use of Authentic Assessment Results*

	Department	N	Mean Rank	Chi-Square	df	p. value
	General Arts	110	111.79			
Result	Science	65	102.92	2.607	2	.272
	Business	36	93.88			
	Total	211				

Source: Field survey, Attom (2016)

The Kruskal-Wallis H test showed that there was no statistically significant difference in use of authentic assessment between the different departments, χ^2 (2) =2.607, p=.272, with a mean rank use of authentic assessment result of 111.79 for General Arts, 102.92 for Science and 93.88 for Business.

Hypothesis Two

Ho: There is no significant difference in the practice of authentic assessment within the categories A, B and C Senior High Schools.

The purpose of hypothesis two was to find out whether a significant difference exists within the categories of schools in terms of authentic assessment practices.

Table 20- *Test of Normality*

	Category	Shapiro-Wilk		
		Statistic	df	Sig.
	A	.965	98	.011
Authentic assessment	B	.976	64	.238
	C	.957	49	.070

Source: Field survey, Attom (2016)

From Table 20, the result for the "Category B" and "Category C" group on the dependent variable, "Authentic assessment" was normally distributed. This is because the Sig. value of the Shapiro-Wilk Test is greater than 0.05. However, for "Category A" group the dependent variable "Authentic assessment", was not normally distributed. This is because the Sig. value of the Shapiro-Wilk Test is less than 0.05.

Table 21- *Test of Homogeneity of Variances*

Levene Statistic	df1	df2	Sig.
1.238	2	208	.292

Source: Field survey, Attom (2016)

From Table 21, the sig. value is greater than 0.05, therefore, variances are assumed equal.

Therefore, one way ANOVA was used to test for the differences between the categories of schools.

Table 22- *ANOVA of Categories of Schools in Terms of Authentic Assessment*

  Practice

Group	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	524.202	2	262.101	4.863	.009
Within Groups	11210.244	208	53.895		
Total	11734.445	210			

Source: Field survey, Attom (2016)

From the one-way ANOVA, $F(2, 208) = 4.863$, p = .009. The result shows that there is a significant difference within the three categories of schools in terms of authentic assessment practices. Hence, a post hoc test was conducted to find out which pairs of means are statistically different. Table 24 presents the post hoc test.

Table 23-*Multiple Comparisons of Categories of Schools in Terms of*

  Authentic Assessment Practices

	(I) Categories	(J) Categories	Mean Difference (I-J)	Std. Error	Sig.
Tukey HSD	A	B	-2.11926	1.17986	.173
		C	2.21429	1.28447	.199
	B	A	2.11926	1.17986	.173
		C	4.33355[*]	1.39356	.006
	C	A	-2.21429	1.28447	.199
		B	-4.33355[*]	1.39356	.006

Source: Field survey, Attom (2016)

From Table 23, the results showed that there is significant difference between Category B and Category C of the selected schools because the sig. value is less than 0.05. Category B practices authentic assessment more than Category C and the difference is 4.3. However, there is no significant difference between Category A and Category B, Category A and C respectively because the sig. value is greater than 0.05.

Discussion of Research Findings

In this section, the findings are discussed in relation to:

1. Teachers' perception of authentic assessment

2. Teachers practices of authentic assessment

3. Use of authentic assessment results

4. Kinds of authentic assessment tasks/strategies

5. Challenges teachers face when using authentic assessment

Teachers' perception of authentic assessment

The findings of the study related to teachers' perception of authentic assessment, in general, indicated that teachers have positive perception of authentic assessment (See Table 11). The findings of the study in terms of authentic assessment requiring students to construct an original response rather than choosing from a list of possibly correct answers and creating a final product directly were wholly supported by the research findings of (Newmann & Wehlage, 1993). They indicated that authentic assessment helps students achieve three broad goals: (a) construct meaning and produce knowledge, (b) use disciplined inquiry to construct meaning and (c) aim work towards production of discourse, product, and performance that have value or meaning beyond success in school. According to the findings of Johnson

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(1994), interpretation of information is based on past experience, new situation and other's opinions. They further revealed that perception is not constant and are usually changing, biased, coloured, or distorted by the unique set of experiences. Thus, perceptions are personal interpretations of the real world.

Miller and Crocker (2005) opined that teachers must perceive authentic assessment as a process of engaging students' in ways so that they can be well-rounded people and lifelong learners but not drill the life out of school with dry test preparation.

The findings in terms of authentic assessment require a collaborative effort to solve problems and also uses students' work which has been collected over time were in line with the research findings of (Mueller, 2006). Mueller asserted that authentic activities provide the opportunity to collaborate. Here the collaboration is integral to the task, both within the course and the real world, rather than achievable by the individual learner (Mueller, 2006). This primarily informs teachers that their perception of authentic assessment must help them teach students the relevance of collaboration. This would help students understand whatever the teacher teaches them so well in the sense that, what they do not know could be explained by their peers when they instill collaborative skills in their students. Mueller (2006) again indicated that authentic activities comprise complex tasks to be investigated by students over a sustained period of time. Here, activities are completed in days, weeks and months rather than minutes or hours. The study conducted by Panizzon and Pegg (2007) revealed that teachers can change their perception once they are taken through appropriate training. All teachers who participated in their study represented a change in their perception enabling them to use collaborative

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effort to engage students' understanding in their classrooms. Teachers require significant investment of time and intellectual resources. Authentic assessment essentially seeks to find out students understanding of a particular subject or event. For students to get an activity done requires adequate time. Hence, teachers' perception of authentic assessment would help them give ample time to students when assessing them with authentic assessment tasks and also encourage student to collaborate with their peers.

Teachers perceived authentic assessment as requiring students to incorporate information from many areas. This was wholly supported by research findings of (Mueller, 2006). According Mueller, authentic activities provide the opportunity for students to examine the task from different perspectives, using a variety of resources. The task offers learners the opportunity to examine the problem from a variety of theoretical and practical perspectives, rather than allowing a single perspective that learners must imitate to be successful. A study conducted by the Kentucky Department of Education (1991) revealed that teachers long for an assessment that relies on more than just written problems that could capture the more diverse skills visible in their classrooms and valued in the workplace, such as artistic talent, computer survey, and the know-how to diagnose and fix problems with mechanical devices. The use of a variety of resources rather than a limited number of pre-selected references requires students to detect relevant information from irrelevant information. Also, in the framework of authentic assessment, Darling- Hammond & Snyder, (2000) are of the view that since the demonstration of relevant competencies is often not possible in one single test, an authentic assessment should involve a full array of tasks and multiple

indicators of learning in order to come to fair conclusions. Chester and Quilter (1998) in their research opined that studying teachers' perceptions of authentic assessment is important in the sense that it provides an indication of how different forms of authentic assessment are being used or misused and what could be done to improve the situation. More critical also is the fact that perceptions affect behavior (Atweh, Bleicker & Cooper, 1998; Calderhead, 1996; Cillessen & Lafontana, 2002).

Teachers practices of authentic assessment

The findings of the study revealed that generally, teachers in the selected senior high schools practiced authentic assessment. Teachers help students to create and organize ideas with a purpose. This was consistent with research findings of (Torrance & Pryor, 2001). Torrance and Pryor pointed out that the interaction between teacher and pupil goes further than just finding out whether the pupil has reached the target behaviour, as in behaviourism. Teacher-pupil interaction in a test situation goes beyond the communication of test results, the judgments of progress and the provision of additional instruction, to include a role for the teacher in assisting the pupil to comprehend and engage with new ideas and problems. Again, findings by Shepard, Morion, Mayfield, Flexer and Weston (1995) revealed that the percentage of students in the participating classroom who could write explanations describing a mathematical pattern, telling how a mathematical table is used also increased substantially from 13% to 55%. Even students who took the wrong answers from their table could describe the pattern. The process of assessment itself is seen as having an impact on the pupil, as well as the product or the result. Here, teachers make sure that students organize

themselves so well towards achieving a particular purpose. How students organize their ideas are effectively guided by teachers.

The study revealed that teachers directed students to effectively translate issues and situations into meaningful tasks that have a clear purpose. This finding is consistent with the findings of (Gulikers, Bastiaens, & Kirschner, 2004). According to them, authentic task in the framework for the dimensions of authentic assessment is defined as a task that resembles the criterion task with respect to the integration of knowledge, skills, and attitudes, its complexity, and its ownership. They further state that the users of the assessment task should perceive the task, including above elements (knowledge, skills, and attitudes) as representative, relevant, and meaningful. Koh and Luke (2009) in their study in authentic assessment practices and conventional assessment in Singapore schools revealed that where teachers set more intellectually demanding tasks, students were more likely to generate work or artefacts judged to be of high quality.

Teachers helped students to reflect on their learning process to take control of their learning. This finding was supported by research findings of Frazier and Paulson (1992) authentic assessment offers many advantages, but Frazier and Paulson (1992) note that the primary value of authentic assessment is that it allows students the opportunity to evaluate their own work and offers students a way to take charge of their learning. According to Harlen (2006), learning focuses attention on the processes of learning and the role of learners. Teachers engage pupils in self-assessment and use their own assessment to try to identify their current understanding and levels of skills. Teachers' practice of authentic assessment helps them to guide students through learning.

Students are guided and directed by teachers to reflect on issues taught so that the understanding would be clearer to them.

The study revealed that teachers assisted students to add supportive details to stories and also communicate meaning through pictures. Teachers again, assist students to co-operate with peers and school personnel. These findings were in line with studies of Harlen (2006) and (Marzano, Pickering & McTighe, 1993). Harlen indicated that in the constructivist classroom, students work primarily in groups and learning and knowledge are interactive and dynamic. Here, the focus and emphasis is on social and communication skills, as well as collaboration and exchange of ideas. This is contrary to what pertains in the traditional classroom where students work primarily alone. Learning is achieved through repetition, and the subjects are strictly adhered to and are guided by a textbook. According to Marzano, Pickering and McTighe (1993), learners extend and refine their knowledge, adding new distinctions and making further connections. Learners commonly engage in the following activities: comparing, classifying, making inductions, making deductions, creating and analyzing support, abstracting and analyzing perspectives (Marzano, Pickering & McTighe, 1993).

It was found that teachers directed students to collaborate to create reports, recipes and others. This was in line with the findings of (Gulikers, Bastiaens, Kirschner, (2004). They posited that in real life, working together is often the rule rather than the exception. Resnick (1987) emphasized that learning and performing out of school mostly takes place in a social system; therefore, authentic assessment should consider social processes that are present in real-life contexts. Again, Gulikers, et al., argue in their framework

that if the real situation demands collaboration, the assessment should also involve collaboration, but if the situation is normally handled individually, the assessment should be individual. When the assessment requires collaboration, processes such as social interaction, positive interdependency and individual accountability need to be taken into account (Slavin, 1989).A study conducted by McMillan, Myran and Workman (2002) aimed at describing the nature of authentic assessment and grading practices supports this finding. They found out that teachers were mostly interested in assessing students' mastery or achievement and that performance assessment was used frequently. Cooney (1992) and Garet and Mills (1995) found similar results.

Use of authentic assessment results

The findings of the study indicated that generally, teachers in the selected schools used authentic assessments results. Teachers in the study mainly used authentic assessment results for (1) helping students become more self-reflective and take control of their own learning, (2) improving and developing teaching and learning. This was supported by a study conducted by Mussawy (2009). His study revealed that a shared understanding exists among teachers in relation to the man purpose of authentic assessment which is to improve instruction and increase learning. (3) Supporting and following up the students' development, (4) helping students set their own goals to further their learning. The study revealed that teachers designed learning activities which are suitable for students. The finding was supported by findings of Bennett, Persky, Weiss, & Jenkins, 2007 that the information on how a student arrived at an answer or conclusion can be valuable in guiding instruction and

monitoring the progression of student learning. Again, a study by Wiggins and McTighe (2007), revealed that a consensus exist among teachers and educators that if test occur only at the end of the term, the result can hardly be used to adapt instruction and to improve learning.

Findings in terms of teachers helping students become more self-reflective and take control of their own learning and helping other teachers focus their instruction more effectively were consistent with research findings of Biggs (1996) and Dochy and McDowell (1998). According to them, teachers used authentic assessment results to help students focus on instruction or teaching and student learning. Gielen, Dochy and Dierick, (2003) in their study revealed that the expected positive influence of authentic assessment on student learning is twofold. First, it is expected to stimulate the development of students' competencies, and second it is likely to increases students' motivation to learn. Herrington & Herrington (1998) in their study on purpose of authentic assessment also found out that increasing the authenticity of assessment can produce a result that could have a positive influence on students' learning and motivation.

Authentic assessment tasks/strategies

The findings of the study indicated that teachers in the selected schools used several authentic assessment tasks. The results indicated that teachers mainly used the following authentic assessment tasks: (1) work samples, (2) constructed responses items, (3) experiment/demonstration, and (4) writing samples and (4) presentations.

The findings of the study indicated that, 162 (76.7%) and 149 (70.6) of the teachers used work samples and demonstration respectively to assess their

students. Under Fox and Soller (2001), in their study on authentic assessment strategies and tools employed by teachers in Malawi found out that, teachers in lower classes used work samples and demonstration to teach concepts that were difficult to understand. The result of their study also indicated that some teachers often encouraged students to work collaboratively using projects, computer-based simulation tasks, storytelling and demonstrations. Again, it was revealed that students in upper classes also demonstrated high level performance in working competitively using writing samples, performance products, and graphic organizers. A similar study conducted by Mbano, (2003); Nampota and Wella, (1999) all in Malawi also in their study showed that writing work samples was used by teachers who participated in the study. The finding is supported by the result of a study conducted by Fook and Sidhu (2010) in Malaysia to investigate the different types of authentic assessment used in higher education. The result of their study revealed that teachers employed the following assessment tools; portfolio (10%), article review (10%) performance product (20%), project (40%) and test (20%). The findings of Fook and Sidhu indicated that alternative and authentic assessment have acceptances from students and should therefore be viewed as an alternative to traditional standardized assessment. Furthermore, they revealed that assessment practices in some subject areas like Mathematics, Science and Social Studies by teachers indicated a favorable emphasis being given to formative assessment because 80% of the total marks were allocated to on-going assessment and 20% was for the test. Moreover, students interviewed also agreed that project and portfolio assignment given were to a great extent real and authentic tasks that they could relate to their future workplace.

Also, Stiggins (1994) in his study concluded that it is important to use a variety of assessment tasks because for some students, written work is difficult so too much reliance on it put them at a disadvantage. He further explains that including a variety or types of assessment tasks will ensure that students are provided with ample opportunities to demonstrate their abilities and teacher will have the information they need to construct a complete, balanced assessment of each student.

Challenges teachers face when using authentic assessment

The findings of the study revealed that generally, teachers faced challenges when using authentic assessment. The study revealed the following challenges faced by teachers. (a) Lack of funds to embark on some experiments and projects, (b) inadequate time allotted on the timetable for various subjects does not permit the use of authentic assessment(c) lack of support from the school authorities in terms of logistics and facilities and (d) large class size makes it difficult to assess students using authentic assessment. These findings were in line with the research findings of Wiggins, (1990). In the literature, Wiggins asserts that using authentic assessment comes with some challenges which include high cost, more effort and time required, and public suspicions regarding the objectivity of authentic assessment. Also, Dunbar (2008) indicated that with more complex tests on large scale though the effort is worthy, the cost and time to create and score authentic assessment tasks year to year could make it too impractical and artificial intelligence is likely to play a big role in scoring of such exams. Again, Schleicher (as cited in Darling-Hammond and Snyder 2000) also revealed in their study that the biggest hurdles in using authentic assessment are time and money. Richer tests

require more of both (time and money) to design and administer them. Eshun, Kankam, Bordoh, Bassaw and Korang (2014) in their study to investigate the influence of authentic assessment on classroom practices of teachers revealed that few teachers used authentic assessment because some teachers revealed that they would be delayed in completing topics in their syllabuses given to them. Again, they found out that the forms of authentic assessment some teachers used in their classrooms were limited due to examination policies, time, resources and assessment methods employed by their schools.

Moreover, according to the report of Todorov and Brousseau (1998), there are several challenges to using authentic assessment methods. They include managing its time-intensive nature, ensuring curricular validity and minimizing evaluator bias. Yang (2015) also postulates that authentic assessment comes with two major challenges. He stated that   authentic assessment is more time consuming than the traditional assessment. He further noted that teachers spend more time in designing the classes and assessing students' performance to facilitate higher cognitive learning. The various challenges revealed in this study are in line with the findings of Beckmann, Senk & Thompson (1997). In their study conducted in the USA, they identified three reasons why teachers do not use multiple assessment methods. First, some teachers had limited knowledge of different forms of assessment. Second, teachers felt they had no time to create different forms of assessment. Third, teachers felt there was little or no professional guidance; therefore, teachers were not confident enough to try out authentic assessments.

Discussion of research hypothesis

Academic departments and practice of authentic assessment

The finding in terms of hypothesis one revealed that, there are no significant differences among the three departments of study in terms of the practice of authentic assessment. This could be due to the fact that, perhaps, respondents involved in the study held staff meetings together to discuss issues of common interest relating to students performance, assessment practices or did collaborate with each other to share views and ideas in modern trends in assessment. By implication, teachers in the departments of General Arts, Science and Business respectively from the selected schools did not differ in terms of the practice of authentic assessment.

Categories of schools and authentic assessment practices

Result of hypothesis two indicated that there was a significant difference within the three categories of schools in terms of authentic assessment practices. By implication the three categories of schools differed in terms of how teachers practiced authentic assessment. This may be due to the fact that Category A schools has more facilities, resources and adequate teachers than Categories B and C. The different teaching strategies employed by the teachers in the Categories A, B and C schools might also account for the differences in authentic assessment practice. Furthermore, the differences may be due to the supervisory roles played by the Heads and stakeholders of the categories A, B and C schools.

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Chapter Summary

The result on teachers' perception of authentic assessment indicated that teachers had positive perception of authentic assessment. With regard to teachers' practices of authentic assessment, the result of the study indicated that teachers practiced authentic assessment. Teachers also agreed that authentic assessment assesses the process of creating final product directly and requires a collaborative effort to solve problems. It was indicated by teachers that authentic assessment used students' work which had been collected over time and also teachers mentioned that authentic assessment required students to incorporate information from many areas

The results of the study concerning the use of authentic assessment result revealed that teachers used authentic assessment results for making informed decisions about their students. The teachers indicated that the result of authentic assessment helped them to design learning activities which were suitable for students, improve and develop teaching and learning. The authentic assessment results helped teachers to guide students to become more self-reflective and take control of their own learning. They also helped other teachers to focus their instruction more effectively.

With regard to kinds of authentic assessment tasks used by teachers, the study revealed that teachers used several kinds of authentic assessment tasks. The major ones used constructed-responses items, experiment/demonstrations, story-telling, projects.

Teachers also indicated that they faced some challenges when using authentic assessment. These include lacked funds to undertake experiments and projects, inadequate time allotted on the timetable for various subjects and

inadequate time to prepare in terms of gathering information and materials to be used for authentic assessment.

Under hypothesis one, the result of Kruskal Wallis H test indicated no significant differences among the three departments in terms of the practice of authentic assessment. Lastly, the result of one-way analysis of variance (ANOVA) on hypothesis two indicated a significant difference within the three categories of schools in terms of authentic assessment practices. It was further revealed that the difference was between Category B and Category C.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

Overview of the Study

The study was a descriptive survey which investigated the perception of public Senior High School teachers on authentic assessment. It also found out the extent to which public Senior High School teachers apply authentic assessment in their assessment procedure. Specifically, the study focused on the following: (a) perceptions of public Senior High School teachers on authentic assessment, (b) teachers' practice of authentic assessment, (c) use authentic assessment results,(d) kinds of authentic assessment tasks/tools, and (e) challenges teachers encountered in the use of authentic assessment.

The study was conducted in the Cape Coast Metropolis in the Central Region of Ghana. Simple random sampling was used to select three schools from category "A" and two from category "B" but the two schools in category "C" were purposively selected. In all seven schools were used. Then proportional stratified random sampling was used to obtain the sample size for each school. Convenience sampling was used to select 226 participants for the study.

A questionnaire comprising of 85 items was the main instrument for data collection. The data collected were analysed mainly by frequencies, percentages, one sample t test, Kruskal-Wallis H test and one way analysis of variance (ANOVA).

Summary of Key Findings

The following are the main findings from the data analysis:

The result on teachers' perception of authentic assessment indicated that teachers had positive perception of authentic assessment. Teachers indicated that authentic assessment provided students with assessment tasks that involved social processes (such as interaction between and among people in the society) equivalent to those in real life situation. They indicated that authentic assessment involved written presentation and oral presentation. Moreover, it was found that teachers agreed that authentic assessment reflected professional practices such as acting, nursing, teaching, engineering and others. Lastly, the study revealed that authentic assessment required students to perform or act out a piece.

With regard to teachers' practices of authentic assessment, the result of the study indicated that teachers practiced authentic assessment. Teachers mentioned that they asked students to create, organize ideas with a purpose and also students demonstrated their ability to organize ideas effectively, reflect on their learning process to take control of their learning, add supportive details to stories and lastly, teachers assisted students to communicate meaning through pictures, constructed an original response rather choose from a list of possibly correct answers. Teachers also agreed that authentic assessment assessed the process of creating final product directly and required a collaborative effort to solve problems and also used students' work which had been collected over time and lastly, teachers mentioned that authentic assessment required students to incorporate information from many areas

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The results of the study concerning the use of authentic assessment result revealed that teachers used authentic assessment for assessing their students. They designed learning activities which were suitable for students. They helped students become more self-reflective and took control of their own learning. They also helped other teachers to focus their instruction more effectively.

Teachers used several kinds of authentic assessment tasks. They used constructed-responses items, experiment/demonstrations, story-telling, projects etc. Teachers faced challenges. They lacked funds to embark on some activities and projects. There was inadequate time allotted on the timetable for various subjects and lastly, inadequate time to prepare in terms of gathering information and materials to be used for authentic assessment.

There was no significant difference among the three departments (General Arts, Science and Business) in terms of practice of authentic assessment results. However, there was a significant difference within the three categories of schools in terms of authentic assessment practices. It was further revealed that the difference was between Category B and Category C.

Conclusions

The study revealed that teachers' in the public Senior High Schools in the Cape Coast Metropolis have more positive perception of authentic assessment. Teachers used authentic assessment results to improve and develop teaching and learning, helping students in setting their own goals to further their learning etc.

However, it was evident that the use of authentic assessment in the Senior High Schools was also associated with some challenges. Some of the

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challenges include; inadequate funds, inadequate time allotted on the timetable which does not permit the use of authentic assessment and large class size which makes it difficult to assess students using authentic assessment and others. The challenges may be due to inadequate financial support from stakeholders and the government, untimely provision of school logistics and lack of teacher motivation. It is therefore, concluded that, teachers admitted in the study that they practiced some authentic assessment forms and used authentic assessment results even though it is bedeviled with many challenges.

Recommendations

In view of the above research findings and the conclusions arrived at the following recommendations are made.

1. A periodic in-service training, workshops and seminars should be organized by Heads of Senior High Schools so that they will be abreast with contemporary issues on authentic assessment (using computer-based simulations, learning logs and journals etc.). This will help teachers to understand the concept of authentic assessment more so that they can recommend to other colleagues to practice.

2. Teachers must be encouraged by their heads of department to use more of graphic organizers, computer simulation task and exhibitions to assess students. These authentic assessment tasks demand students to think deep into issues before bringing out appropriate solutions to a particular problem and to improve their learning.

3. Heads of Senior High Schools reschedule the teaching time table in order to make adequate instructional time for teachers. This would

make teachers feel relaxed and composed but not tensed up when using authentic assessment.

4. Adequate funds must be made available by the Heads of the Senior High Schools from their internally generated funds to the heads of departments to enable them secure logistics and also to undertake some projects and activities to improve students understanding of concepts.

Suggestions for Further Research

The following are recommended for future research.

1. The study was exploratory in nature. In order to accept or refute the findings of the study and generalise them for the whole country, it is suggested that the study is replicated in other senior high schools in the country.

2. Future research should be carried out on the perception of public Senior High School teachers of authentic assessment in specific subject areas such as English, Mathematics, Science and Social Studies.

3. Again, it is suggested that future research be carried out on the perception and practices of senior school teachers on authentic assessment in private senior high schools in the Cape Coast metropolis.

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TEACHER'S QUESTIONNAIRE`

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATIONAL STUDIES

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Dear respondent,

This is an anonymous questionnaire. Do not write your name, or any comment that would identify you on the questionnaire.

This questionnaire seeks your response about teachers' perceptions and practices of authentic assessment at the Senior High School. There are no right or wrong answers to the question. Information from this questionnaire will be used to improve teaching and classroom assessment practices in the Cape Coast metropolis and in Ghana as whole. The confidentiality and anonymity of your responses are assured. The information you provide will be used for academic purpose only.

This questionnaire is divided into four sections. The first section is for eliciting information about background characteristics. Then the other sections are about the perception and practices of authentic assessment in your school.

INSTRUCTION: You are kindly requested to tick ($\sqrt{}$) and/or supply short response(s) where necessary in spaces provided.

SECTION A

Bio Data

1.   Gender: Male [   ]

Female [   ]

2.   Your rank

Teacher [   ]   Principal Superintendent [   ]

Assistant Superintendent [   ]   Assistant Director II [   ]

Superintendent   Assistant Director I [   ]

Senior Superintendent   None of the above [   ]

Others Please specify....................

3.   What subject(s) do you teach…………………………………..…

4.   What class(es) do you teach……………………………………………

5.   Please indicate your highest qualification in your area of Discipline

Diploma in Education [   ]

Higher National Diploma [   ]

B.Ed [   ]

BA or BSc [   ]

6.   How long have you taught at the senior high school level? ……….
        Years

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Section B

Teachers' perception of authentic assessment

Definition of authentic assessment: Authentic assessment is assessment that occurs continually in the context of a meaningful learning environment and reflects actual and worthwhile learning experiences that can be documented through observation, anecdotal records, work samples, journals, logs, conferences, portfolio, writing, discussions, experiments, presentations, exhibits, projects, and other methods (Winograd & Perkins 1991).

Authentic assessment has to do with students demonstrating that they know a body of knowledge, have developed a set of skills, and can apply them in a 'real life' situation and can solve real life problems. Authentic assessment is performance-based and requires students to exhibit the extent of their learning through a demonstration of mastery.

Indicate your agreement or disagreement with these statements by a tick (√) in the spaces provided: SA=Strongly Agree; A= Agree; Disagree; SD = Strongly Disagree.

7.   Basic elements of authentic assessment

Statement	SA	A	D	SD
Authentic assessment requires students to construct an original response rather than choose from a list of possibly correct answers				
Authentic assessment tasks foster higher order thinking				

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Authentic assessment assesses the process of creating final product directly				
Authentic assessment requires a collaborative effort to solve problems				
Authentic assessment assesses projects				
Students learn to evaluate their own work using predetermined criteria during authentic assessment.				
Authentic assessment uses student work which has been collected over time				
Authentic assessment is based on clear criteria given to students				
Authentic assessment allows for a particular task to yield multiple scores in different content domains				
Authentic assessment requires evaluation of changes in performance over time				
Authentic assessment requires students to incorporate information from many areas				
Authentic assessment reflects students' competencies in applying their knowledge and cognitive skills to solve substantive, meaningful tasks				

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Section C:

Practices of authentic assessment

8.   **The statements below describe authentic assessment practices that are used. Please indicate the extent to which you use these practices in your teaching**

Statement	Always	Most of the time	Occasionally	Never
I guide students to effectively translate issues and situations into meaningful tasks that have a clear purpose.				
I ask students to write simple sentences expressing a complete thought				
I ask students to create and organize ideas with a purpose				
I ask students to use symbols and words to show meaning				
I assist students to collaborate to create editorials, reports, recipes etc.				
I assist students to prepare a criteria for assessing their own project				
I guide students to apply their knowledge to real life problems				

I ask students to demonstrate their ability to organize ideas effectively				
I guide students to use hands-on tasks to conduct several investigations				
I ask students to provide explanations for their responses.				
I assist students to add supportive details to stories				
I ask students to co-operate with peers and school personnel				
I ask students to reflect on their learning process to take control of their learning				
I assist students to communicate meaning through pictures				
I assist students to demonstrate and extend their understanding about number meaning				
I make informal observation about how students are responding to instruction				

SECTION D

Indicate your agreement or disagreement with these statements by a tick (√) in the spaces provided: SA=Strongly Agree; A= Agree; D=Disagree; SD = Strongly Disagree

9.   Please indicate the extent to which you use the result of your authentic assessment.

Statement	SA	A	D	SD
Designing learning activities which are suitable for students				
Supporting in additional teaching				
Supporting and following up the students' development				
Improving and developing teaching and learning				
Helping administrators understand how groups of students are progressing				
Helping parents understand more about their children's progress as learners				
Helping students become more self-reflective and take control of their own learning				
Helping students set their own goals to further their learning				
Helping other teachers focus their instruction more effectively				
Providing students the opportunity to make choices and reflect on their own learning both individually and socially				

SECTION E:

Kinds of authentic assessment tasks and tools Senior High School teachers use to assess their students' learning outcomes

10.   Please indicate the extent to which you use these authentic assessment tasks or strategies.

Authentic Assessment Tasks/strategies	Always	Most of the time	Occasionally	Never
Assessing work samples				
role-play				
Constructed-Response Items				
Experiments/Demonstrations				
Projects				
Exhibitions				
Writing Samples				
Story Telling				
Presentations				
Drama				
Report writing				
Computer simulation task				

Section F:

Challenges Senior High School Teachers encounter when using authentic assessment

Indicate your agreement or disagreement with these statements by a tick (√) in the spaces provided: SA=Strongly Agree; A= Agree; D=Disagree; SD = Strongly Disagree

11.   Please indicate the extent to which you encounter these challenges in using authentic assessment in your subjects areas.

Statement	SA	A	D	SD
The school assessment system makes it difficult to use authentic assessment				
Lack of funds to embark on some activities and projects				
Lack of support from the school authorities in terms of logistics and facilities				
Lack of motivation from school authorities				
Developing authentic assessment task is difficult				
Inadequate time allotted on the timetable for various subjects does not permit the use of authentic assessment.				
Inadequate time to prepare in terms of gathering information and materials to be used for authentic assessment.				
Large class size makes it difficult to assess students using authentic assessment.				
Some topics are difficult to assess using authentic assessment.				

Others, please specify

……………………………………………………………………….

………………………………………………………………………..