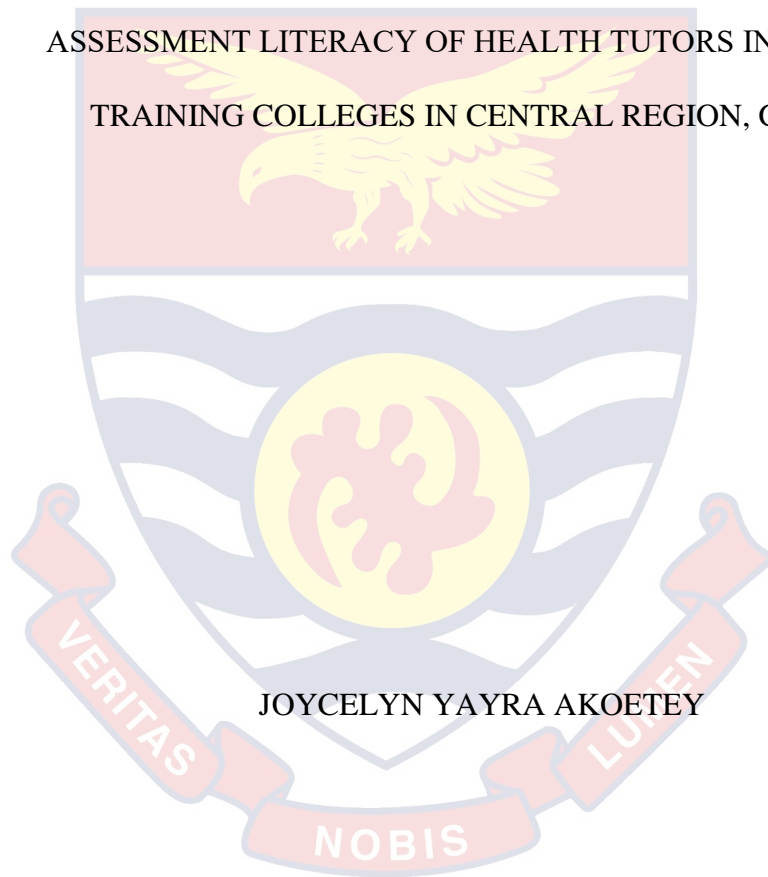


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ASSESSMENT LITERACY OF HEALTH TUTORS IN NURSES'
TRAINING COLLEGES IN CENTRAL REGION, GHANA

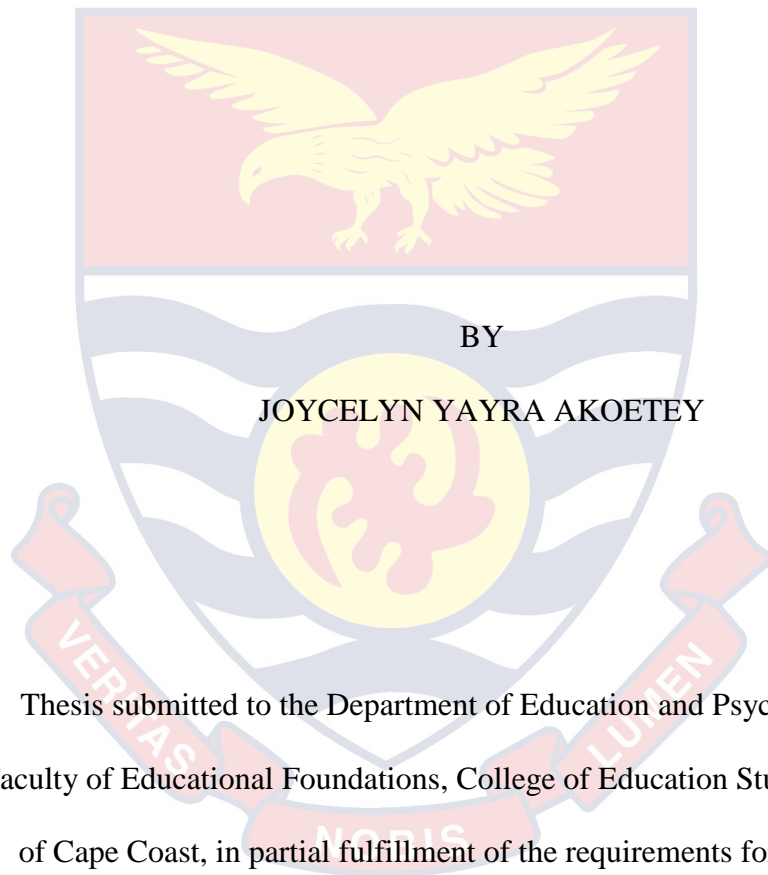


JOYCELYN YAYRA AKOETEY

2021

UNIVERSITY OF CAPE COAST

ASSESSMENT LITERACY OF HEALTH TUTORS IN NURSES'
TRAINING COLLEGES IN CENTRAL REGION, GHANA



BY

JOYCELYN YAYRA AKOETEY

This thesis submitted to the Department of Education and Psychology of the Faculty of Educational Foundations, College of Education Studies, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Philosophy degree in Measurement and Evaluation

JUNE 2021

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:

Supervisor's Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of the thesis laid down by the university of Cape Coast.

Principal Supervisor's Signature: Date

Name:

Co-supervisor's signature: Date

Name:

ABSTRACT

The study investigated classroom assessment literacy and adherence to the recommended principles in constructing multiple-choice items among nursing tutors in Central Region of Ghana. Descriptive survey design was used where the whole accessible population of the nursing tutors was covered. The main instrument used for data collection was a closed-ended questionnaire (dichotomous and rating scales). The study revealed that majority of tutors had classroom assessment knowledge. Tutors followed [12(60%) out of 20] recommended principles in multiple-choice test construction. However, differences in their assessment literacy and adherence to the recommended principles were influenced by their professional qualification. Tutors with professional qualification in education had higher assessment literacy and adhered to principles in constructing multiple-choice items than those without professional qualification in education. The study recommended that heads of various health institutions are encouraged to organise workshops/seminars on test construction at least twice every year especially for tutors without professional qualification in education and those below three years of teaching. Health tutors in Central Region are encouraged to take advance courses in assessment in order to keep themselves abreast with updated issues as far as assessment is concerned.

KEYWORDS

Assessment literacy

Health tutors

Multiple-choice questions (MCQ)

Principles of constructing multiple-choice test items

Professional qualification in education

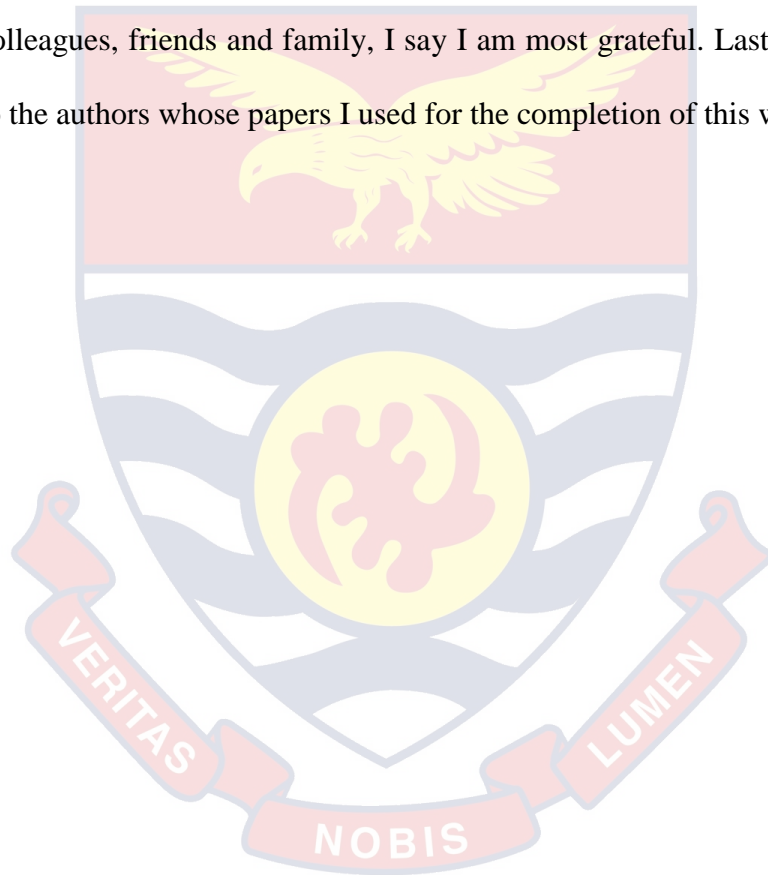
Years of teaching



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I express my greatest gratitude to the principals and the entire tutorial staff of the Public Nursing and Midwifery Training Colleges in the Central Region of Ghana. Again, for the assistance and encouragement from my colleagues, friends and family, I say I am most grateful. Lastly, I am thankful to the authors whose papers I used for the completion of this work.



DEDICATION

To my dear parents, Mr and Mrs Akoetey and my wonderful daughter,

Nefertiti



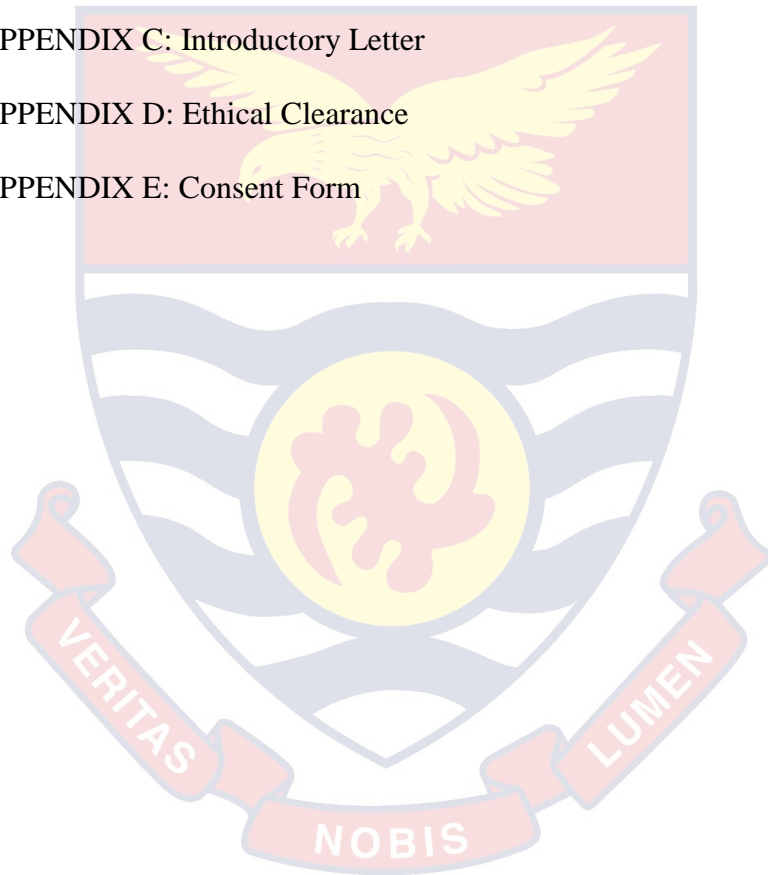
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CHAPTER ONE

INTRODUCTION

Assessment serves as a powerful tool for catalysing the academic achievement of educational goals, most importantly when it is rightly done. Classroom assessment literacy is the knowledge and skill necessary for compiling data about students' achievement and for effectively utilising the assessment process and outcomes to develop and improve the quality of instruction of teachers and learning of students. In nursing education, the assessment of students involves a series of complexities. Theory and practice are usually assessed simultaneously. Thus, in a matter of securing professional license to practice nursing within and outside Ghana, nursing students must pass the licensing examination by the Nursing and Midwifery Council of Ghana (NMC).

However, a decline in the performance of student nurses professional Licensure Examinations (LE) in the various regions; including Central Region over the years is a major concern to stakeholders. This decline in performance could be attributed to several factors including assessment practices. It is, therefore, necessary to enquire into the assessment literacy and how tutors in the public nursing and midwifery schools in the Central Region who prepare these students for this important examination adhere to the basic principles in constructing multiple choice items.

Background to the Study

Globally, nursing education involves both theoretical and practical training processes. It is undergoing changes in order to meet the needs of

quality education (Slevin & Lovery, 2001). According to Quinn (2005), quality of instruction in nursing education depends on the quality of the learning process. Andrusyszyn (2009) noted that in nursing education, theory and practice are often assessed simultaneously and this assessment is three-dimensional (cognitive, psychomotor and affective domains of learning). The assessment of the three domains provides a more holistic picture of students' performance or students' abilities upon specific competencies.

Assessment is an integral component of teaching and learning (Gronlund, 2006). It is the process of gaining information on what is learnt after teaching. Assessment is the process of gathering evidence of student learning to inform education-related decisions. The primary purpose of assessment is to improve students' learning, as both student and teacher respond to the information that it provides. Assessment is a powerful tool in making improvements in educational systems (Qualters, 2001; Koh, 2011). Classroom assessment is an important tool for developing the quality of students.

There has been substantial discussion in recent years regarding the importance of developing teachers' assessment literacy (Volante & Fazio, 2007; White, 2009; Popham, 2009a; Deluca & Klinger, 2010). Assessment literacy is defined as the knowledge about how to assess what students know and can do, interpret the results of these assessments, and apply these results to improve student learning and programme effectiveness (Webb, 2002). Assessment literacy entails understanding and proper use of assessments based knowledge of theoretical and philosophical foundations of the measurement of students' learning (Volante & Fazio, 2007).

In essence, assessment literacy is present when a person possesses the assessment-related knowledge and skills needed for the competent performance of that person's responsibilities (Popham, 2009b). It includes knowledge of formative and summative assessment, classroom and large-scale assessment, and key psychometric concepts (Deluca & Klinger, 2010). According to Chappuis, Stiggins, Chappuis and Arter, (2012), assessment literacy is the knowledge and skills necessary for compiling data about students' achievement and for effectively utilising the assessment process and outcomes to develop and improve the quality of instruction of teachers and students' learning.

Assessment literacy encompasses the knowledge and skills educators need to: (1) identify, select or create assessments optimally designed for various purposes and (2) analyse, evaluate, and use the quantitative and qualitative evidence generated by assessments to make appropriate decisions to advance student learning (Kahl, Hofman, & Bryant, 2013). Nursing tutors who have sufficient background knowledge in assessment are able to integrate testing into learning and also use an instructional format that is suitable for students (McMillan, 2000; Volante & Fazio, 2007).

Effective assessment practices in the classroom plays a vital role in ensuring students are meeting instructional objectives. Despite the great deal of emphasis being placed on classroom assessment over the years by educators, evidence suggests deficiencies in classroom assessment knowledge, competencies and skills among teachers (Daniel & King, 1998; Aschbacher, 1999; McMillan, Myran & Workman, 2010).

This concern with classroom teachers' assessment literacy is not different from the nursing educationalist. For example, clinical assessment poses problems for nurse educationalists (While, 2001) as many factors affect the validity of the assessment process in clinical practice (Girof, 2003). Malone (2008) also found that nursing tutors receive limited pre-service training in assessment and testing as most of them lacked assessment literacy despite having positive attitudes towards assessment and perceiving high levels of competence in assessment (Alkharusi, Aldhafri, Alnabhani and Alkalbani, 2012).

Similarly, Yamtina and Wongwanich (2014) revealed that most of the nursing tutors had low level of classroom assessment literacy. Rafiee, Moattari, and Mousavinasab (2014) confirmed that assessment affects students' perceptions of learning and how they learn; hence, nursing tutors should apply appropriate and objective clinical evaluation methods and tools, and perform a formative and summative clinical evaluation.

Factors influencing teachers' assessment literacy (knowledge, competence, skills) had been explored with inconclusive results. For example, Kershaw (1993) concluded that teacher characteristics such as age, gender, education level, teaching experience, related work experience, programme area, and type of school impacted their knowledge toward assessment, which in turn impacted their use of student assessment data to inform educational decision making. However, Williams and Rink (2003) concluded that teacher-level factors (gender and teacher training) had no significant relationships with teachers' accuracy of scoring. Pope, Green, Johnson, and Mitchell (2009) found that teachers' knowledge and skills in educational assessment including

the ability to determine unethical assessment practices improved significantly after a workshop.

Veldhuis and van den Heuvel-Panhuizen (2014) found that teacher's age and gender had no significant effect on teachers' assessment practices. Sato, Chung and Darling-Hammond (2008) had also earlier found significant difference between professional teachers (National Board certified) and non-professional teachers (non-National Board certified) quality of formative assessment rubrics that they developed. Meanwhile, Koh (2011) found that length of training and teaching experience had a significant impact on teachers' acquisition of assessment literacy which was again confirmed by Alkharusi (2011), where he found that in-service assessment training and teaching experience correlated positively with educational assessment knowledge. However, in contrast, Jarr (2012) found no significant relationships between years of teaching experience and performance on the assessment results' interpretation and use of total score, but did discover that teacher participants who reported having previously participated in some form of professional development focused on the use of assessments to guide instruction had higher levels of assessment self-confidence.

In Ghana, nursing education has evolved over the years with the prime objective of providing high quality nursing education that produces well-educated and skilled nurses according to the needs and requirements of the dynamic growing Ghanaian society, as well as, meeting the demands of managing emerging diseases (Nurses and Midwives Council of Ghana, [NMC], 2003). Nursing education is designed to educate and train nursing students to become competent and qualified professional nurses who have

mastered certain skills and are knowledgeable about the science of nursing in order to provide skilled nursing care (Mellish, Brink & Paton, 2009).

Nursing education in Ghana is regulated by the Nursing and Midwifery Council (NMC) for the purpose of rationalizing the training and education of nurses and midwives and the maintenance and promotion of standards of professional conduct and efficiency. The Council was set up under the statutory mandate of the National Redemption Council Decree (NRCD) 117 of the 1972 and L.I. 683 of 1971. The NMC's mandate, as provided in Section 4(2f) of NRCD, is the examination of student nurses and midwives and the determination of nursing graduates' minimum competence and preparedness to provide safe and effective nursing care. Student nurses who successfully graduate from nursing programmes must pass the licensure examination in order to be registered as nurses.

Currently, the licensure examination is held biannually, (in February and August). The examination is in two parts, a practical and a theoretical session. The practical component requires that student nurses utilise the nursing process to identify patients' problems, plan, and intervene. Using an Objective Structured Clinical Examination (OSCE) tool, the student is further observed when intervening in the problems identified. The theoretical component has six papers comprising medical and surgical nursing, mental health nursing, paediatric nursing, public health nursing, and obstetric nursing. Every student pursuing nursing must meet the standards of the NMC by passing each of the six examination papers with a minimum of 50% to be eligible for professional registration by the Nursing Council of Ghana. Success in the licensure examination is therefore the only legal prerequisite to practice

as a nurse within Ghana. Failing in any paper means that the candidate must pay the full fees again to retake the examination when next offered.

However, efforts at ensuring quality training of health personnel appears to be threatened by significant failure rates in Ghanaian nursing training institutions (Wilmot, Kumfo, Danso-Mensah & Antwi-Danso, 2013). An analysis of the results of the students registered by the Nursing and Midwifery Council of Ghana revealed that, the pass rate had dropped significantly from 82.1 % in 2007 to 28.9 % in 2011. A report by the Nursing and Midwifery Council of Ghana showed that out of the 2,178 candidates presented for the Registered General Nurses Licensing Examination (RGN-LE) in 2011, the bulk of the candidates (1,355) representing 62.2% were referred while only 823 representing 37.7 % passed (Bonney, 2011). More also in 2012, majority of the candidates representing 71.1% presented for the professional LE failed (NMC, 2013). This decline in performance is attributed to several factors including assessment practices, students-related factors as well as home-related factors. According to O'Connor (2014), classroom assessment is a major determinant of students' performance.

In Ghana, the current education system demands that teachers (including nursing educators, tutors, mentors or preceptors) have a command of different forms of classroom assessment. Specifically, they need to be able to create and implement valid and reliable assessments in order to measure student learning and gauge the effectiveness of their teaching. They are expected to use a variety of strategies to assess and evaluate student learning in the classroom, laboratory, and clinical settings as well as in other domains of learning. Nurse educators are responsible for formulating programme

outcomes and designing curricula that reflect institutional philosophy and mission, contemporary healthcare trends, and community and societal needs to prepare graduates to function effectively in a complex, dynamic, multicultural healthcare environment.

Educators need to demonstrate knowledge of curriculum development, including identifying programme outcomes, developing competency statements, writing learning objectives, selecting appropriate learning activities, and determining evaluation strategies. Hence, assessment of nursing tutors' classroom assessment literacy is important for the development of quality of learning and instruction in nursing education.

Statement of the Problem

Effective classroom assessment supports strong curriculum and instruction by providing data to show what strategies are successful and by helping educators target instruction to specific student needs. Student success largely depends on one essential piece, assessment (Webb, 2002; O'Connor, 2014). In Ghana, success in student nurses licensing examination had been one of the most widely used indicators of nursing programme quality. Success in the licensure examination is the only legal prerequisite to practice as a nurse within and outside Ghana. However, the decreasing performance of student nurses in the professional licensure examinations (LE) over the years is a major concern to stakeholders. Nursing schools throughout the country are therefore concerned about the poor performance of nursing students in the NMC-organised licensure examination.

Furthermore, in recent times, a large number of students who sit the Nursing and Midwifery Council (NMC) organised licensing examination fail

on their first attempt (NMC Report, 2013). For example, regional performance in 2014, only 53.8% of the 2489 candidates who sat the licensure examination passed. Also, in 2015, out of 3123 candidates who sat the licensure examination, only 52.4% passed. This trend of decline in performance was witnessed in 2016 (51.8%), 2017(52.7%) and 2018(51.2%) respectively. This decline in performance is pronounced within the various regions in Ghana, including Central Region.

Factors contributing to this poor academic performance of student nurses are, however, poorly defined in Ghana. These factors may be school-related, teacher-related, curriculum-related and student-related (Agyemang-Dankwah, 2015; Amankwaa, Agyemang-Dankwah & Boateng, 2015; Doe, Oppong & Sarfo, 2018). Within the curriculum and teacher-related factors, classroom assessment practice is perceived as an important factor that influences students' performance (Webb, 2002; O'Connor, 2014). Nursing tutors are expected to have sound knowledge and appropriate application of assessment in instructional intercourse (Churchill, et al., 2011). Thus, it is vital for nursing tutors to be assessment literate (Schafer, 1993; Popham, 2009).

In Ghana, studies on nursing education focused on academia and clinical proficiency (Adzimah-Yeboah, 2012), challenges of clinical education (Asirifi et al. 2017), and nursing educational curriculum (Achampong, 2017; Zutah, 2017). Meanwhile assessment practices with regards to academic qualification with professional grade level (SNO, PNO, Technical officer etc.) of tutors and its influences on assessment practices in terms of planning, construction, evaluation, administration and scoring was studied by Wiredu (2013). The researcher answered questions on the basic principles

underpinning assessment. However, recognising the impact assessment has on teaching and learning, what assessment data yields for teachers regarding students' learning and its use as a tool to improve student learning was under emphasized. Popham (2009) noted that educators' inadequate knowledge in assessment can cripple the quality of education. Thus, classroom assessment is an important method for developing the quality of students. Stiggins (2002) posited that assessment literates know the essential aspects of effective teaching and learning. Assessment-literate teachers understand how to measure the process of learning.

Furthermore, studies on assessment practices in Ghana largely focused on basic schools (Hayford, 2007; Nugba, 2012; Anane & Anhwere, 2013; Asare, 2015; Amoateng, 2017; Amedeker, 2018), senior high school teachers (Ababio & Dumba, 2013; Sofu, Ocansey, Nabie, Asola 2013; Kankam, Bordoh, Eshun, Bassaw & Koranteng, 2014; Awoniyi, 2016) and colleges of education (Akyeampong, 1997; Bordoh, Bassaw & Eshun, 2013; Bekoe, Eshun & Bordoh, 2013; Eshun, Bordoh, Bassaw & Mensah, 2014; Amua-Sekyi, 2016). Despite the widespread calls for assessment capable teachers, research indicates that deficiencies still exist in classroom assessment knowledge of teachers. Again, the findings from these studies did not find any evidence to support the fact that all teachers have adequate level of knowledge in classroom assessment practices.

In tertiary institutions in Ghana, especially, the nursing training colleges, assessment are supposed to be practiced using techniques such as diagnostic assessment, portfolio assessment, self-assessment, peer-assessment among a host of others. This is because it is through assessment of various

forms that knowledge imparted is measured and faculties are trained and skills developed. Nursing tutors are expected to assess students' learning and performance whether teaching in the classroom or clinical setting. They are expected to write and analyse their results; develop rating scales and other clinical evaluation methods; observe performance in simulation, the skills laboratory and clinical practice; and plan other strategies for assessing learning.

However, from my personal observation and experience, it appears that few nurse tutors or educators understand the importance of effectively using assessment to promote and improve students' learning and performance, analyse and make decision with assessment data, knowledge and competences in educational assessment. It is against this background that this study intended to examine the assessment literacy of nursing tutors in Central Region, Ghana.

Purpose of the Study

The main thrust of the study was to examine the assessment literacy of nursing (health) tutors in Central Region, Ghana. Specifically, the study was guided by the following objectives: To

1. examine the knowledge level on classroom assessment literacy of health tutors,
2. determine the difference in knowledge level in classroom assessment of health tutors with respect to professional qualification in education,
3. determine the difference in knowledge level on classroom assessment of health tutors with respect to years of teaching and
4. assess how tutors follow principles in writing multiple-choice items.

Research Questions

The study is guided by the following research questions:

1. What is the knowledge level of health tutors in classroom assessment literacy in Central Region of Ghana?
2. How do health tutors follow principles in writing multiple-choice items?

Research Hypotheses

The study tested the following hypotheses:

1. H_0 : There is no significant difference in the knowledge level of health tutors in classroom assessment with respect to professional qualification in education.
 H_A : There is significant difference in the knowledge level of health tutors in classroom assessment with respect to professional qualification in education.
2. H_0 : There is no significant difference in the knowledge level of health tutors in classroom assessment with respect to years of teaching.
 H_A : There is significant difference in the knowledge level of health tutors in classroom assessment with respect to years of teaching.

Significance of the Study

It is expected that the findings of this study would enable health tutors to understand the important of assessment in determining students' success and ways of developing processes for developing the quality of instruction. School administrators to call for services to trained and retrained to update the professional status of tutors in order to effectively respond to the changing needs of new methods of classroom assessment, and nursing lecturers in the

universities and university colleges develop courses in educational assessment literacy in order to equip students who desire to teach after school with the needed competence in assessment. Nursing and Midwifery Council (NMC) and other policy makers implement, use or formulate educational policies governing educational assessment to improve the quality of Nursing Training Colleges (NTC) in Ghana.

Findings of this study would equally provide information for curriculum planners revealing the non-compliance of textbooks with curriculum, Nursing and Midwifery Council (NMC), nursing lecturers with regard to the quality of health tutors' assessment literacy. This would help to conduct training and workshops based on their deficiencies and limitations with regards to assessment literacy. It is also expected that the outcome of this study will be an important means of improving health tutors assessment practices in the classroom and most necessarily be accompanied by changes in the instructional process and improve learners' performance in nursing education.

Lastly, the study results would provide a framework to support health tutors in making the new assessment approaches more relevant for their classroom assessment practices and may also influence scholarly research, theory and practice leading to an educational intervention on the issues of classroom assessment in nursing education. The outcome of this study will contribute to literature on health tutors' assessment literacy (knowledge, and competencies).

Delimitations

Geographically, the study was delimited to all public nursing training colleges in Central Region of Ghana. There are five public nursing training colleges in Central Region of Ghana, namely: Ankaful Nurses Training College, Winneba Community Nursing Training College, Cape Coast Nursing and Midwifery Training College, Nursing and Midwifery Training College, Twifo Praso and Nursing and Midwifery Training College, Dunkwa - On-Offin. The study was delimited to health tutors. The study was again delimited to tutors assessment literacy, particularly, their knowledge and competencies.

Limitations

The study was based on health tutors in public nursing training colleges in Central Region of Ghana. Therefore, the findings cannot be generalised to all nursing tutors or educators in Ghana and other subject teachers. However, the findings of this study can only be specifically used within the context of this study because it does not represent all health or nursing tutors in Ghana.

The health tutors' knowledge and competencies were solely based on their views, believes and practices in assessment in nursing education. Thus, this result cannot be generalized on using other types of obtaining data on assessments in the classroom. It is perceived that some of the health tutors might have shown negative attitude towards filling the questionnaire and they might not give honest response. This might, in part, affect the degree of the validity and reliability of the results obtained.

Definition of terms

Assessment literacy- tutors knowledge and competence in assessment practices and the understanding of classroom assessment principles.

Health tutors – all tutors teaching in the nursing and midwifery training college.

Public nurses' training colleges- the nursing training colleges that are funded in terms of college infrastructures by the government of Ghana.

Licensure Examination (LE) – the final examination taken by all final year nursing or midwifery students in order to be licensed to practice in Ghana and elsewhere in the world.

Nursing tutor – health tutors with professional training in nursing.

Nursing and Midwifery Council of Ghana (NMC) - a regulatory body of nurses and midwives practice in Ghana.

Years of teaching- the number of years of teaching experience of tutors

Professional qualification in education – nursing tutors with formal professional training in education.

Organisation of the Study

The entire study is divided into five chapters. The first chapter, Chapter One, provides an overview of the research work. The chapter introduces the background of the study, the statement of the problem, purpose of the study, research questions and hypotheses, significance of the study, delimitation, and the limitations of the study. Chapter Two reviews relevant related literature to existing studies that have been conducted on assessment literacy. Chapter Three constitutes the research methods. It includes research approach, research design, population, sample and sampling procedures, data

collection instrument, validity and reliability issues, data collection procedures, data processing and analyses. Chapter Four is devoted to presentation of results and discussion. The final chapter, Chapter Five focuses on summary, conclusions and recommendations.



CHAPTER TWO

LITERATURE REVIEW

Introduction

The main purpose of the study was to examine the assessment literacy of nursing tutors in Central Region of Ghana. This chapter reviews comprehensive and relevant literature on assessment literacy. The chapter is divided into three sections. The first section looks at theoretical review, the second section, conceptual review and the third section empirical review.

Theoretical Framework

The study was theoretically reviewed under Title's theory for classroom assessment practice and classical test theory.

Title's Theory for Classroom Assessment Practice

Teacher beliefs can be conceptualised within the framework and theory of Title (1994) which she developed to guide assessment practices in classrooms. This theory emphasises the following dimensions about classroom assessment practices: (a) Interpretation and knowledge, beliefs, intents, and actions, and (b) Assessment characteristics, embeddedness in practice, format and mode, scoring, evaluation, preparation and feedback. Title (1994) also points out that there are two things essential to know about assessments which are knowledge related to teaching and knowledge about assessment process. Teachers' self-knowledge of classroom assessment practices play a major role as it covers a wide range of issues and teachers' belief systems. For instance, teachers may have construed meanings about professional expectations,

standards, values, and their personal effectiveness as well as construed beliefs about assessment.

Furthermore, teacher belief systems were found to be integral part of informing their general teaching practices. Teachers are likely to hold beliefs about assessment on students before assessment (provide a focus of learning), knowledge about assessment effects on students during assessments (provide a sense of accomplishment, challenge, failure, or inadequacy), and knowledge about assessment effects on students after assessments (as fair, meaningful, useful providing information for continuing development or lack of it).

Nursing tutors may also have beliefs about the effects of assessment on teachers themselves, such as requiring instructions on particular topics or problems or providing or not providing useful information for instruction (Title, 1994). The model suggests that nursing tutors' competencies and assessment practices have influence on classroom assessment practices. The model also gives a highlight of whether teachers are able to assess ability to contribute solutions to real life problems, assessing ability to make inferences, assessing ability to analyse ideas as well as assessing ability to access information to guide decision making. On assessment practice to evaluate students learning various classroom assessment modes were used. These included observations, student's self-assessment, peer assessment, projects and portfolios. Each of these factors plays a role in classroom assessment practices whose intent was to examine the extent to which teachers apply assessment practices, their skills and competencies in evaluating students learning.

Classical Test Theory (CCT)

The CTT model is one of the significant issues from British psychologist Charles Spearman's fascination with the concept of correlation and examines tests as entities. Spearman (1904 - 1913) published logical and mathematical arguments that test scores are fallible measures of human traits, and it observed correlation between their "true objective values." In repeated attempts to explain the term true objective values, Spearman (1907, 1913) laid the foundation for the classical true score model. It was later restated and elaborated notably by several authors (Guilford, 1946; Gulliksen, 1950; Magnusson, 1971; Lord & Novick, 1968) as $X = T + E$, where X , T , and E are observed, true, and error score random variables, respectively.

The CTT approach determines item characteristics from the available observed data (Reynolds, Livingston, Willson & Willson, 2009). CTT assumes that the total number of items answered correctly indicates the examinee's level of ability or knowledge (de Ayala, 2009; Schaughency, Smith, vanderMeer, Berg, Secolsky & Denison, 2012). In other words, students who get a higher proportion of items correct know more than those with a lower percentage correct. Most commonly, letter grades are associated with ranges of percentage correct (e.g., $B = 70$ to 79%) or a pass-score can be set at a proportion correct (e.g., 60%).

Classical test theory specifies that the score achieved by an individual examinee is equal to the sum of their theoretical true ability and the unobserved error component in the test (Ebel & Frisbie, 1991). The proportion of candidates getting an item right (p) determines the difficulty of each item; items that are too easy ($p > 0.80$) or too hard ($p < 0.20$) are frequently rejected

from a test as not providing useful information about candidate ability. Ideally, all items in a test discriminate positively between those who know most and those who know least. This is determined by examining the point-biserial correlation (r_{pb}), which is the correlation of the item to the total after the item has been removed from the total. In many testing situations, items which do not have a significantly positive value ($r_{pb} > 0.20$) are rejected, though any positive value indicates a tendency for higher scoring candidates to get individual items correct more than the lower scoring candidates (Ebel & Frisbie, 1991).

Given the mean, standard deviation, and reliability estimate of a test, it is possible to calculate a standard error of measurement, which is the range of scores that each candidate would most likely get the next time they sat the exact same test (Harvill, 1991). The standard error of measurement (SEM) indicates the number of marks a score could vary by chance, without any substantive change in the student's ability and should be used in making decisions about quality or change (Crocker & Algina, 2008). Thus, the CTT approach provides sufficient statistics to evaluate items for difficulty and discrimination. However, in CTT, examinee ability is "sample dependent" meaning that if the test is difficult, the students will seem to be low achievers and vice versa (Hambleton, Swaminathan & Rogers, 1993).

Similarly, items have difficulty values totally dependent on the ability of the sampled test takers, and so a change in their ability will change the item difficulty. This means that, items will have very different characteristics depending on who attempted them and what other questions were present (Hambleton & Jones, 1993).

This theory relates to this work in the sense that tutors' knowledge of this model should aid in better understanding of the characteristics of tests and how this is used to improve the various achievement tests (objectives and essays) administered and scored by tutors. The knowledge of this theory goes a long way in reducing errors occurring in classroom achievement tests through the practices of qualitatively analysing their tests and thereby bringing out the observed scores that approximate true abilities in test takers. This then increases and ensures credible, reliable and valid measurements.

Conceptual Review

This section reviews concept related to assessment, types of assessment and purposes of assessment, assessment literacy, importance of assessment literacy and competence in assessment of students.

Concept of Assessment

Assessment is an integral component of teaching and learning (Gronlund, 2006). It is the process of gaining information about the deficiencies in knowledge acquired, and learning is about the attempts to reduce these deficiencies. Assessment is the process of gathering evidence of student learning to inform education-related decisions. Assessment is a continuous, on-going process that involves examining and observing student's behaviours, listening to their ideas, and developing questions to promote conceptual understanding (Chisholm, 2004).

Arends (1997) contended that, assessment usually refers to the full range of information gathered and synthesised by teachers about their students and their classroom so as to make decisions about learners and instruction. In addition, Reece and Walker (2003) have also defined assessment as the

process of obtaining information about how many of the students know the importance of continuous assessment. Griffith (2003) pointed out that assessment is a broad term that encompasses the entire process of collecting, synthesising, and interpreting information, whether formal or informal, numerical or textual. Also, Nwahunanya (2007) defined assessment as the process of gathering information about a student in order to make decisions about his or her educational attainment.

Likewise, Omole (2007) stipulated that assessment in education connotes fixing the amount of knowledge acquired by students in the course of an instructional programme over a period of time. It can therefore be defined as a method of determining how well the learners have mastered the educational process as stated in the taxonomy of educational objectives. The primary purpose of assessment is to improve students' learning, as both student and teacher respond to the information that it provides. Assessment is a powerful tool in making improvements in educational systems (Qualters, 2001, Koh, 2011).

Types of Assessment

Assessment can be divided into two types. These types are summative and formative assessment.

Summative assessment

Summative assessments most often occur at the end of a unit of instruction and at term or year-end when students are ready to demonstrate achievement of curriculum objectives. Summative assessments are used to measure what students have learnt at the end of a unit, to promote students, to ensure they have met required standards on the way to earning certification for

school completion, to enter certain occupations, or as a method for selecting students for entry into further education (Asale, 2017). It is also helpful for providing information based on the assessment of effectiveness of a programme of instruction (Asale, 2017).

Summative assessment strategies are administered periodically at end of instruction to determine at a particular point in time what students know and do not know within a specified curriculum. These strategies cannot provide immediate feedback because the results are known too late and information is not available to the pupils about the strengths or weaknesses of their work (Stiggins, 2005). Summative assessment strategies are limited to administrative decisions and assigning of grades (William & Thompson, 2008).

Formative assessment

Formative assessments are based on the on-going observations which teachers make use of regarding a child's progress. Formative assessment refers to frequent and interactive assessments of student progress and understanding to identify learning needs and adjust teaching appropriately. Formative assessment provides feedback that leads to students recognising their learning gap which is self-monitoring, (Harlen, 1998; Asale, 2017).

Formative assessment strategies involve ways of gathering, interpreting, and acting on information about students' learning so that it may be improved. According to Bell and Cowie (2001), formative assessment strategies may be formal or informal, and take place in the course of instruction. Formal formative assessment strategies take the form of curriculum-embedded assessment that focus on some specific aspect of

learning, but they can also be direct questioning, quizzes, brainstorming and generation of questions.

Conversely, informal formative assessment strategies are improvised and can take place in any student-teacher interaction at whole class, small group, or one-on-one levels. It can arise out of any teaching/learning activity at hand. It is embedded in and strongly linked to learning and teaching activities (Bell & Cowie, 2001). Formative assessment incorporates alternative assessment techniques into teaching and learning, (William & Thompson, 2008).

Purposes of Classroom Assessment Practices

Classroom assessment is seen as a vital ingredient for effective teaching and learning. It is essential because it gives students guidance on their performance and contributes to improving the learning process (Linn & Gronlund, 2000; Popham, 2008). Classroom assessment provides feedback on students' progress over a period of time so that any errors or learning difficulties can be identified and corrected.

Research evidence show that classroom assessment is a fundamental aspect of the teaching and learning process, and that when it is integrated in classroom practices substantial learning gains can be achieved (Black & Wiliam, 1998; Stiggins, Arter, Chappuis & Chappuis, 2006). Due to the powerful influence of assessment on learning outcomes, researchers have advocated for the integration of assessment with teaching and learning (Black & William, 1998; Stiggins et al., 2006). The role of teachers in ensuring that assessment leads to effective teaching and learning cannot be over-emphasised.

Understanding the purposes of assessment has its own importance. This is because such a knowledge will help those who are going to implement these techniques of assessment to give due consideration and increase their effort towards its proper implementation. Classroom assessment is seen as a vital ingredient for effective teaching and learning. It is essential because it gives students guidance on their performance and contributes to improving the learning process (Stiggins, 1992; Popham, 2008). Assessment is important to monitor school programmes and to compare programmes or projects, placing students in special groups or ranking students for special purposes, conducting research on teaching methods or curriculum (Asale, 2017).

Salvia and Ysseldyke (1978) have outlined five specific purposes for assessing students. These are for screening, placement, programme planning and evaluation, assessment of individual progress and diagnosis. Some assessments can serve one purpose while others are multi-purpose in nature.

1. Screening: Achievement tests are routinely administered to help in the identification of students who may need special attention. For example, when choosing students for a further course or for employment, test may be given to students and based on the results, those who do not meet the criterion for admission may be given the necessary assistance based on their difficulty area in the test.
2. Placement: In a school, assessment results are used to place students with different academic abilities into groups. Students who are not placed in honours sections for example are placed at other educational levels (Nitko, 2001). Information from

assessment is used to decide placement in groups for assignment or group work or to assign students to a remedial programme. Individuals are grouped according to similar abilities and no student is rejected. It helps to decide how to teach individuals as well as a group as their educational levels is known.

3. Programme planning and evaluation: Results from assessment are used to either plan other educational activities or for evaluating the effectiveness of already existing educational programmes or of a specific curriculum.
4. Assessment of individual progress: Assessment is used in monitoring progress of students through grades which each individual student obtains. Grades obtained in an assessment are an indication of the academic progress made by students.
5. Diagnosis: Diagnostic assessment deals with the identification of both appropriate content and features of learning activities in which students have learning difficulties. When the learning difficulties are identified, remedial help is then offered to these students.

Below are some other identified purposes of assessment set by Nitko (2001); selection, provision of feedback to students, provision of feedback to teachers, motivation of students, for counselling and guidance decisions and for credentialing and certification.

1. Selection: Assessment results are used to select individuals for specific educational activity, according to set criteria. Individuals who do not meet these set criteria are not considered for that educational activity.

For example, writing an entrance examination to select students to offer a course at the university.

2. Feedback to students: Results from assessment must help students to be aware of their wrong and right answers to questions. Students' errors can be corrected during lessons and these corrections can be done by the teacher or the student himself.
3. Feedback to teacher: If the assessment results indicate that students have not grasped a concept, then it is appropriate that the teacher re-teach that concept.
4. Motivation of students: Assessment helps students to learn. When students achieve a certain level of the learning target, they are motivated to learn more. Those who are not able to perform in a particular assessment are also motivated to learn in order to achieve a learning target.
5. Counselling and guidance: Assessment results provide information on the abilities and interest of students that are mostly used to assist students in exploring and choosing careers as well as directing them to prepare for the selected careers. Exploring career options is likely to be an on-going and changing series of decisions, perhaps occurring throughout a person's life.
6. Credentialing and certification: These are decisions concerned with student attainment of certain standards of learning. It focuses on student's attainment of minimum competence or high standard depending on the state's legal mandate or by voluntary means. If a state law mandates that students achieve certain standards of

performance, students are administered an assessment procedure created at the state level. The students meeting the standards are awarded a credential, example high school diploma.

Joshua (2005) outlined the purposes of educational testing, measurement and evaluation as follows;

1. Proficiency: Is necessary to establish the proficiency level of an individual in a given skill before such an individual is selected to practice (like in the case of a nursing student obtaining a professional license or driving license). Minimum competency test may be used for this.
2. Ranking: Mostly the need arise to position people according to their acquisition of a particular attribute. Sometimes, grades are assigned to marks, and some examinees are identified as high achiever/performer, having achieved more than others. Tests are mainly developed for such purpose only.
3. Administrative decisions: Usually, there are decisions that administrators are faced with, that must be taken. Some of these decisions include; which programme to adopt, which personnel to be posted to which area of need. Measurement results are sometimes used for such decisions.
4. Research purposes: Educational measurement can be used in hypothesis building or hypothesis testing, which is sometimes crucial in research process_ particularly in the development of educational and psychological theories. Definition and verification

of constructs, and investigation on the inter-relatedness of variables are all made possible by the use of test and measurement.

5. Pre-assessing the learners' needs: Verifying the students'/pupils' entry behaviour(s) in the class (or the learners' readiness for the planned instructional offering) is sometimes made possible through the use of tests and measurement.

Concept of Assessment Literacy

Assessment literacy refers to educators' understanding of the principles of sound assessment to skilfully develop assessments that transform learning purposes into assessment activities which exactly demonstrate student understanding and achievement (Mertler & Campbell, 2005; Stiggins, 2002). Assessment literacy is again defined as the knowledge about how to assess what students know and can do, interpret the results of these assessments, and apply these results to improve student learning and programme effectiveness (Webb, 2002). Rohaya and Mohd-Najib (2008) also defined assessment literacy as the competency of teachers' knowledge in the assessment field.

According to Chappuis, Stiggins, Chappuis and Arter (2012), assessment literacy is the knowledge and skills necessary for compiling data about students' achievement and for effectively utilising the assessment process and outcomes to develop and improve the quality of instruction of teachers and learning of students.

Assessment literacy entails understanding and proper use of assessments based on knowledge of theoretical and philosophical foundations of the measurement of students' learning (Volante & Fazio, 2007). It requires

that educators' possess the knowledge about the basic principles of sound assessment practice, including terminology, the development and use of assessment methodologies and techniques, familiarity with standards of quality in assessment and familiarity with alternative to traditional measurements of learning (Paterno, 2001). Stiggins (1991) notes that assessment-literate educators must know "what they are assessing, why they are doing so, how best to assess the achievement of interest, how to generate sound samples of performance, what can go wrong, and how to prevent those problems before they occur" (p. 281).

Based on such knowledge, teachers can practice the principles, procedures, strategies, and assessment methods appropriately to assist the learning process. Thus, it will enable teachers to make more accurate and fair decision about students, curriculum, and educational programmes. In essence, assessment literacy is present when a person possesses the assessment-related knowledge and skills needed for the competent performance of that person's responsibilities (Popham 2009b). It includes knowledge of formative and summative assessment, classroom and large-scale assessment and key psychometric concepts (Deluca & Klinger, 2010).

Assessment literacy is crucial so that educators can support and measure teaching and learning. Effective assessment practices in the classroom plays a vital role in ensuring students are meeting instructional objectives. Stiggins (2005) argues that teachers require a more sophisticated understanding of assessment to help learners meet the increasing demands of the knowledge economy.

In addition to the shift in types of assessments used, teachers have also become increasingly accountable to the public. Stakeholders now expect teachers to be able to provide an informed rationale for the assessment tools they use. Unfortunately, most of today's teachers at almost all levels know little about assessment because they were traditionally not trained in it (Popham, 2004, 2009a). In fact, "one of the most serious problems in today's education profession is that, the level of educators' "assessment literacy" is so abysmally low" (Popham, 2010, p. 175).

Importance of Teachers' Assessment Literacy

Assessment of students is one of the most important responsibilities of teachers, because the quality of teaching in classroom is closely associated with the quality of the applied assessment (Bachman & Palmer, 1996). One becomes assessment literate by mastering basic principles of sound assessment practice, coming to believe strongly in their consistent, high-quality application in order to meet the diverse needs of all students, and acting assertively based on those values (Bachman & Palmer, 1996). Without a deep understanding of what constitutes a balanced approach to assessment, as well as what constitutes an assessment-literate educator, classroom teachers are ill-prepared. Hence, it is essential for teachers to possess assessment literacy.

According to Bayat and Rezaei (2015), assessment literacy is important because it helps teachers to perceive, analyse and use data on student performance to improve teaching. Stakeholders are influenced by language tests, therefore being assessment literate is more vital for them because assessment illiteracy results in inaccurate assessment and

consequently the purposes of assessment could not be fulfilled. The profound payoff of assessment literacy is that those who possess it can avoid making the assessment-based mistakes so prevalent in schools these days. Teachers who have little knowledge in assessment, unfortunately, often use the wrong kinds of standardized tests in evaluating their students. It is necessary for nursing tutors to develop assessment literacy to prevent serious consequences for teachers and students (Bayat & Rezaei, 2015).

Assessment literacy helps the nursing tutor to understand that it is not possible to conduct a sound assessment without a clear and specific purpose. It helps them to understand that assessment systems must take into account and balance the needs of users throughout the local context. It helps them to believe the intended purpose for any assessment is a guiding light—it must serve its user(s) information needs (Nitko, 2001). Assessment purpose must be clear from the very beginning because it anchors the entire assessment process, whether a teacher is designing a task to be performed or a state is deciding which standardized test to adopt (Mertler, 2004). An assessment must be capable of fulfilling its intended purpose by providing relevant, required information (Nitko, 2001).

Assessment literate nursing tutors should know that establishing the purpose of any assessment must take into account the importance of all assessment users, especially students whose assessment literacy is critically important as they learn to use assessment results to inform their own learning (Kubiszyn & Borich, 2013). Assessment literacy helps educators to believe that instructional decision makers, at every level, must take into account all relevant and available evidence of student learning and in effect to inform

their instructional decisions. In other words, all users are entitled to high-quality, understandable assessment results (Mertler, 2004).

According to Popham (2004), assessment literacy helps classroom teachers to understand that the learning target(s) to be assessed form the foundation of the tasks, items, or exercise and scoring procedures that will make up the assessment. Indeed, the target(s) of interest determine the assessment method(s) to be used. Therefore, assessors must begin assessment development and use with those learning expectations clearly and unambiguously defined. Finally, those engaged in assessment understand that learning targets vary profoundly in type and complexity across subjects and ascending grade levels, as well as according to individual student needs (Popham, 2004).

Assessment literate individuals believe that intended learning target(s) must be clear, appropriate, and available for all involved—most importantly students—to see from the outset of instruction and assessment. In addition, they believe that assessors themselves must be confident, competent masters of the learning targets to be reflected in the assessment (Popham, 2004).

Assessment literacy helps the classroom teacher to understand that the quality and impact of any assessment is a direct function of the effectiveness of the communication of the resulting information to its intended users. Truly, effective communication places resulting information in the hands of users in a timely and understandable manner. The standard of timeliness is determined by when the decision is to be made; for example-whether a student is making revision decisions, a teacher is designing the next lesson, a principal is

designing a school-wide programme, or a district is developing its strategic plan (Stiggins, 1991).

Assessment literate persons understand that the assessment process can contribute to the productive motivation of both students and teachers. They understand that, for teacher and student alike, fear, vulnerability, and anxiety are the enemies of learning success, while a sense of self-efficacy, confidence, and accomplishment promote an on-going academic success (Taylor, 2009). On behalf of students, assessment literate people understand that, used effectively in instruction, assessment can cause learning, not merely measure it. It can support learning by engaging students in on-going self-assessment, so they can see themselves growing and as a result, actually be in charge of their own success (Taylor, 2009).

Again, in Ghana the Part Three of the Health Professions Regulatory Bodies Act, 2013 (Act 857) mandates the Nursing and Midwifery Council (NMC) to secure in public interest the highest standards of training and practice of Nursing and Midwifery. The council carries out this mandatory responsibility by assessing the nurses and midwives trainees through the NMC licensure examination. This examination helps the council to ensure that the nurses and midwives trainees render safe, efficient and prompt services to the general public as far as health is concerned. The fulfillment of this essential mandate is greatly dependent on the nursing (health) tutors in the various nursing institutions across the country including health tutors in nurses' and midwifery training colleges in Central Region, Ghana. This therefore raises the need for all tutors in the Nurses' Training Colleges in Cape Coast, Ghana, the important knowledge and understanding on the concept of assessment and

how its effective use improves both instruction and students' learning in preparing trainees towards the NMC licensure examination.

Standards for Teacher Competence in Educational Assessment

Competencies are the skills and knowledge that enable a teacher to be successful. To maximise student learning, teachers must have expertise in a wide-ranging array of competencies in an especially complex environment where hundreds of critical decisions are required each day (Jackson, 1990). This implies that nursing students' assessment is an essential part of teaching and that good teaching cannot exist without good student assessment. The assessment competencies are the knowledge and skills critical to a teacher's role as educator.

An effort to improve classroom assessment literacy of teachers necessitates the presence of a specific set of standards on educational assessment which teachers will have to observe. Having a set of specific assessment standards for teachers would set better practice of proper classroom assessment (Magno, 2013). However, Magno notes these set of specific assessment standards are only present in few countries or states like the United States, New South Wales, and New Mexico. In the United States, the National Council on Measurement in Education (NCME), American Federation of Teachers (AFT), and the National Education Association (NEA) jointly developed the Standards for Teacher Competence in Educational Assessment of Students.

The American Federation of Teachers, the National Council on Measurement in Education, and the National Education Association (1990) have constructed the standards for teacher competence in educational

assessment of students based on the concept that assessment is an integral part of instruction and that effective instruction cannot take place without good assessment of students. The Standards encompass teachers' professional roles as well as their responsibility for student assessment as follows:

1. Teachers should have the skills to choose an appropriate assessment method to make decisions about instruction. The skills to choose assessment methods that are appropriate, beneficial, convenient to manage and administer, technically sufficient, and fair are necessary for the utilisation of data to support decision-making about instruction. Teachers need to be familiar with the types of data derived from different forms of assessments, including their strengths and weaknesses. In particular, teachers should familiarise themselves with assessment criteria and the selection of assessment methods that are consistent with the lesson plans.
2. Teachers should have the skills to develop an appropriate assessment to make decisions about instruction. Teachers tend to use assessment tools that have been published or publicised by outside sources, but most of the assessment data used in making decisions are likely to come from self-constructed assessment methods of the teachers.
3. Teachers should have the skills to manage, score, and interpret the assessment outcomes, using both readily available assessment methods and in-house methods. Being able to choose and develop good assessment methods is not enough. Teachers should be able to implement good assessment methods appropriately. They should also

have the skills to manage and administer assessment methods, score, and interpret outcomes of different assessment methods.

4. Teachers should have the skills to utilise assessment outcomes to make decisions about each student, to plan for instruction, to develop the curriculum, and to improve the school. Assessment outcomes are generally used to make educational decisions on various levels—on the classroom level to make decisions about students, on the community level to make decisions about the school, and on the educational district and societal levels to make decisions related to objectives and outcomes of educational organizations. Teachers play a major role in the decision-making process on each level, and they should be able to effectively utilize the assessment outcomes.
5. Teachers should have the skills to develop the process to ensure accuracy of students' achievement levels based on the assessment. Assigning students' achievement levels is considered a major part of professional practices of teachers as it indicates both students' performance outcomes and teachers' values given to such performance. Teachers should employ assessment principles to ensure accurate levels of learning outcomes of students.
6. Teachers should have the skills to communicate assessment outcomes with students, parents, interested persons, and other educators. Teachers need to report assessment outcomes to students and parents on a regular basis. In addition, teachers are continually asked to report or consult regarding the assessment outcomes with other educators as well as various other audiences. If assessment outcomes cannot be

communicated effectively, they may not be used constructively or may not be used at all. In order to effectively communicate students' assessment outcomes to others, teachers need to be able to use assessment terms appropriately as well as to communicate the meaning, limitations, and implementation of the assessment outcomes. Furthermore, teachers sometimes need to protect their own assessment process and its interpretation, and they may also need to help the public interpret the assessment outcomes appropriately.

7. Teachers should have the skills to be aware of assessment methods and uses of assessment data that are unethical, illegal, or inappropriate. Teachers need to be knowledgeable about their ethical and legal responsibilities as well as their accountability regarding assessment. All student assessment activities need to emphasise fairness, the rights of all parties involved, and ethical codes of conduct of the profession, starting from planning and compiling data to interpret, utilise, and communicate assessment outcomes. Moreover, teachers should make efforts to discontinue inappropriate practices as soon as they are detected, and should participate more in the wider educational community to determine the appropriate scope of professional codes of conduct for assessment.

Multiple-Choice Test Items

According to Joshua (2005), multiple-choice test items consist of questions or statements parts, called “stem”, and a set of possible answers called “options” or “alternatives” from which the examinee is to select the correct answer. The correct answer, which must be one, is called “the key”,

while the incorrect options are called “distractors”. Multiple-choice test items are considered the best, most popular and widely used type of objective tests.

Multiple-choice question or item consists of a given problem (known as a stem), and a list of suggested solutions (known as alternatives). The alternatives usually include one correct answer (the best alternative), as well as several incorrect or inferior alternatives, known as distractors (Brame, 2013). Student’s task is to select the alternative that presents the best answer for the given problem. The purpose of the distractors is to appear as plausible solutions of the given problem for those students who have not achieved the objective being measured by the item. Conversely, the distractors must appear as implausible solutions for the students who have achieved the objective.

According to Mehrens and Lehmann (1991); Nitko (2001), there are variations of multiple-choice questions such as the one “correct response” (single-answer), single “best response” (best-answer) and “multiple responses”. Examples of these types are presented as follows.

1. One correct response

Kwame is scheduled for endoscopy. This type of surgery is termed as...

- A. Curative
- B. Diagnostic**
- C. Explorative
- D. Palliative

This is the simplest type of multiple-choice item. The student is required to select the one correct answer listed among several plausible, but incorrect options.

2. Single best response

Which of the following is the first step to take when there is post-operative bleeding from a wound?

- A. Change wound dressing
- B. Clean around wound
- C. Report to the surgeon
- D. Reinforce wound dressing**

This is a much difficult type of multiple-choice item. The student is required to select a single response or answer, that is considered “best” among other equally right answers.

3. Multiple responses

The three effects of general anaesthesia on a patient are...

- I. Analgesia
- II. Consciousness
- III. Muscle relaxation
- IV. Unconsciousness

- A. I, II, III
- B. II, III, IV
- C. I, III, IV**
- D. I, II, IV

This type of multiple-choice item has more than one correct answer. With this type, the student is required to select each option that applies.

Advantages of multiple-choice questions (MCQ)

Multiple-choice questions tests have certain advantages. Examiners must be aware of these features in order to use multiple-choice questions effectively. Below are presented some most important advantages of using multiple-choice tests as an assessment tool (Burton, Sudweeks, Merrill, & Wood, 1991; Chan, 2009; Dikli, 2003; Towns, 2014).

1. **Versatility:** MCQs are applicable in many different subject-matter areas and can be used to assess various levels of learning outcomes or instructional objectives (from simple recall of knowledge to more complex levels, such as application, analysis and evaluation).
2. **Reliability:** Reliability is defined as the degree to which the test consistently measures the learning outcomes. Appropriately written multiple-choice questions are more reliable than the tests including other types of questions – matching tests, short answer items, true and false tests, completion tests and essay types tests (Joshua, 2005).
3. **Scoring:** MCQ are easier to score than other types of tests because there is no need to resolve partial and misspelled answers. Scoring is more objective than the assessment including essay questions. The scoring is not accepted by the examiner's inconsistencies and not immune to the influence of bluffing and writing ability of students (Joshua, 2005).
4. **Validity:** Validity is defined as the degree to which the test measures the learning outcomes it aims to measure. Because MCQ is usually answered more quickly than essay question, tests based

on MCQs can focus on a relatively broad course material, thus increasing the validity of the assessment (Bacon, 2003).

5. Efficiency: The usage of MCQ is very important for the examiners because they allow easy and quick evaluation. These tests are particularly essential for the examiners who cover multiple courses with large number of enrolments. Multiple-choice test assessment expedites the reporting of students' results, thus allowing the examiner a quick insight of their achievements and an opportunity to give additional clarifications and instructions before the course is completed.
6. Multiple choice tests cover a wide range of curriculum contents (Joshua, 2005).

Limitations of multiple-choice questions

The assessment of learning outcomes with MCQ is often criticised. The rest of this subsection presents an overview of the MCQ limitations as indicated by Burton et al. (1991), Joshua (2005), Mehrens and Lehmann (1991).

1. Versatility: Certain researchers emphasise that the MCQ evaluate student's ability to memorise, rather than understand, apply and analyse information (Walsh & Seldomridge, 2006).
2. Reliability: MCQs are susceptible to guessing, and this guessing factor reduces the reliability of scores obtained.
3. Difficulty of construction: Good MCQs are generally difficult and time-consuming to write than other types of questions. This is

particularly evident for the process of determining plausible distractors, which requires a certain amount of skill.

4. Cognitive domain: Constructing well multiple choice test items requires a great deal of testing skills, especially items assessing higher levels of cognitive domain. There is a greater probability of teachers writing items demanding only factual re-call.
5. Cost: It is comparatively more expensive to create multiple choice items in terms of number of paper pages to be used and printed.
6. Time: Multiple choice tests require a lot time for students to response, most importantly when very fine discrimination is to be made.
7. Multiple choice tests allow examinees to recognise the correct answer that ordinarily they would not be able to produce.
8. Rowley (1974) stated that studies have shown that test-wise students perform better on multiple choice items than non-test-wise students and usually favours the high risk-taking students.

Guidelines / Principles for Constructing Multiple-Choice Items

The following guidelines as explained by Amedahe and Asamoah-Gyimah (2016), Attali and Bar-Hillel (2003), Baker (1971), Haladyna and Downing (1989), Haladyna (2004), Joshua (2005), Mehren and Lehmann (1991), Nitko (2005) are specifically designed for the single-answer and best-answer varieties of multiple-choice items;

1. Construct each item to assess a single written objective.

Items that are written with a specific objective in mind often end up measuring lower-level objectives exclusively, or covering trivial material that is of little educational worth.

2. Based each item on specific problem stated clearly in the stem.

The stem is the foundation of the item. After reading the stem, the student should know exactly what the problem is and what he or she is expected to do to solve it. If the student has to infer what the problem is, the item will likely measure the student's ability to draw inferences from vague descriptions rather than his or her achievement of a course objective.

3. Include as much of the item as possible in the stem, but do not include irrelevant material.

Rather than repeating redundant words or phrases in each of the alternatives, place such material in the stem to decrease the reading burden and more clearly define the problem in the stem.

4. State the stem in positive form (in general).

Negatively-worded items are those in which the student is instructed to identify the exception, the incorrect answer, or the least correct answer. Such items are frequently used, because they are relatively easy to construct. The teacher writing the item need only come up with one distractor, rather than the two to four required for positively –worded items. Positive items, however, are more appropriate to use for measuring the attainment of most educational objectives.

5. Word the alternative clearly and concisely. Clear wording reduces student confusion, and concise wording reduces the reading burden placed on the student.

6. Keep the alternatives mutually exclusive.

Alternatives that overlap create undesirable situations. Some of the overlapping alternatives may be easily identified as distractors. On other hand, if the overlap includes the intended answer, there may be more than one alternative that can be successfully defended as being the answer.

7. Keep the alternatives homogeneous in content.

If the alternatives consist of a potpourri of statements related to the stem but unrelated to each other, the student's task becomes unnecessarily confusing. Alternatives that are parallel in content help the item present a clear-cut problem more capable of measuring the attainment of a specific objective.

8. Keep the alternatives free from clues as to which response is correct.

Poorly-written items often contain clues that help students who do not know the correct answer to eliminate the incorrect alternatives and increase their chance of guessing correctly. Such items tend to measure how clever students are in finding the clues rather than how well they have attained the objective being measured. The following suggestions will help in detecting and removing many of these clues from items;

- i. Keep the grammar of each alternative consistent with the stem. Students often assume that inconsistent grammar is the sign of distractor, and are generally right.

- ii. Keep the alternative parallel in form. If the answer is worded in a certain way and the distractors are worded differently, the student may take notice and respond accordingly.
- iii. Keep the alternative similar in length. An alternative noticeably longer or shorter than the other is frequently assumed to be the answer, and not without good reason.
- iv. Avoid textbook, verbatim phrasing. If the answer has been lifted word-for-word from the pages of the textbook, the students may recognise the phrasing and choose correctly out of the familiarity rather than achievement.
- v. Avoid the use of specific determiners. When words such **never**, **always**, and **only** are included in detractors in order to make them false, they serve as flags to the alert student.
- vi. Avoid including keywords in the alternatives. When a word or phrase in the stem is also found in one of the alternatives, it tips the student off that the alternative is probably the answer.
- vii. Use plausible distractors. For the student who does not possess the ability being measured by the item, the distractors should look as plausible as the answer. Unrealistic or humorous distractors are non-functional and increase the student's chance of guessing the correct answer.

9. Avoid the alternatives “**all of the above**” and “**none of the above**”.

These two alternatives are frequently used when the teacher writing the item has trouble coming up with a sufficient number of distractors. Such teachers emphasise quantity of distractors over quality.

Unfortunately, the use of either of these alternatives tends to reduce the effectiveness of the item.

10. Use as many functional distractors as are feasible.

Functional distractors are those chosen by students that have not achieved the objective and are ignored by students that have achieved the objective. In other words, they have positive discrimination.

11. Include one and only one correct or clearly best answer in each item.

When more than one of the alternatives can be successfully defended as being the answer, responding to an item becomes a frustrating game of determining what the teacher had in mind when he or she wrote the item. Such ambiguity is particularly a problem with items of the best-answer type, where more than one alternative may be correct, but only one alternative should be clearly best. If the competent authorities cannot agree on which alternative is clearly best, the item should either be revised or discarded.

12. Present the answer in each of the alternative positions approximately an equal number of times, in a random order.

Many teachers have the tendency to avoid placing the answer in the first or last alternative positions, preferring instead to “bury the answer in the middle.” This tendency however, is not unknown to certain students, who generally select one of the alternatives in the middle if they are unsure of the answer. Also, if there is a noticeable pattern to the positions of the answers from item to item, alert students will take notice and make selections accordingly. In either case, the unprepared but clever student increases his or her chances of obtaining a higher

score. The easiest method of randomising the answer position is to arrange the alternative in some logical order. That is, either in numerical, alphabetical or sequential order. Violating this makes the item easier.

13. Lay out the items in a clear and consistent manner.

Well-formatted test items not only make taking the test less confusing and less time consuming for students, they also make grading the test easier, especially when the grading is done by hand. The following suggestions could help improve the layout of your items.

- i. Provide clear directions at the beginning of each section of the test.
- ii. Use vertical format for presenting alternatives.
- iii. Avoid changing pages in the middle of an item.

14. Use proper grammar, punctuation, and spelling.

Adherence to proper use of grammar, punctuation and right spelling reduces ambiguity in items and encourages students to take the test more seriously.

15. Avoid using unnecessarily difficult vocabulary.

If the vocabulary is somewhat difficult, the item will likely measure reading ability in addition to the achievement of the objective for which the item was written. As a result, poor readers who have achieved the objective may receive scores indicating that they have not. Use difficult and technical vocabulary only when essential for measuring the objective.

16. Constructing effective alternatives. The process of creating item's alternatives should fulfill the following recommendations (Frey et al., 2003):

i. All alternatives should be plausible. Implausible alternatives do not present functional distractors and should not be used. The common students' mistakes provide the best source of distractors.

ii. The alternatives should be stated clearly and concisely and should be mutually exclusive. Students consider that the items containing alternatives with an overlapping content can undermine the confidence of the evaluation.

iii. The alternatives should not provide clues which rule them out. Otherwise, the sophisticated students can reveal the correct answer easily. Therefore, it is important that the alternatives are similar in length, use the same expression style and have a grammar consistent with the stem.

iv. The alternatives "all of the above" and "none of the above" should be avoided when designing multiple-choice items. If the alternative "all of the above" is used as a correct answer, the student who can identify more than one alternative as correct can select the correct answer even though he or she is not sure about the other alternatives. The same argument is true when the alternative "none of the above" is used as a correct.

In both cases, it is possible to apply partial knowledge to correctly answer the item.

- v. The general assumption in the process of designing multiple-choice questions is that the order of the alternatives is completely irrelevant, until answers are randomly assigned to positions or equally distributed among them (Attali & Bar-Hillel, 2003). In that sense, Hohensinn and Baghaei (2017) examined if the item difficulty depends only on the item stem, or it is influenced by the position of the correct answer. The

analysis confirmed that the position of the correct answer has a very small effect on the multiple-choice item difficulty and the common practice of distributing correct options randomly is valid. Haladyna et al. (2002) presented taxonomy of guidelines for creating MCQs. The part referring to the positions of the alternatives emphasises that the alternatives should be given in a logical order (such as alphabetical or numerical) to avoid biases towards certain positions.

- vi. The number of alternatives can vary among multiple choice questions, as long as all the alternatives are plausible. There is no strong evidence that confirms significant differences in the item difficulty and the reliability of the test results between the questions that contain two, three or four distractors (Haladyna, 2004).

17. Constructing an effective stem. The following requirements are crucial in the process of constructing an effective stem (Frey et al., 2003):

- i. The stem should be meaningful by itself and should present a definite problem. Such a stem guarantees that the item is focusing on assessing learning outcomes.
- ii. The stem should not contain irrelevant information, which can reduce the reliability and the validity of the test results (Haladyna & Downing, 1989).
- iii. The stem should be expressed with a negation only when a significant learning outcome requires it. Studies have confirmed that students have difficulty in understanding items with negative phrasing (Rodriguez, 1997). If there is a necessity of a negative expression for assessing specific expertise (such as in medicine), then the negation must be emphasised with italics or capitalisation.
- iv. The stem should be a question or a partial sentence (Statman, 1988). A question stem is preferable because it allows the student to focus on answering the question, rather than memorising the partial sentence and subsequently completing it with each of the alternatives.

Empirical Review

This section reviews relevant literature carried out by other researchers on assessment literacy. This section is divided into five subheadings based on the research questions and hypotheses that guided the study. The subheadings include the following:

- a. Teachers' Assessment Literacy
- b. Professional Qualification in Education and Teachers' Assessment Literacy
- c. Years of Teaching and Teachers' Assessment Literacy

- d. How Teachers Follow Principles of Constructing Multiple-Choice Tests
- e. Teachers' Competencies in Assessment Practices

Teachers' Assessment Literacy

There have been several studies on both assessment literacy (general) and classroom assessment literacy of teachers. A national study in the United States measured teachers' assessment literacy (Plake, 1993) by using the Standards as a blueprint for the development of a survey instrument. The instrument (the Teacher Assessment Literacy Questionnaire) consisted of 35 items (5 per standard). Items were developed as application-type questions that were realistic and meaningful to teachers' actual practices. The instrument went through extensive content validation and pilot testing. A representative sample from around country was selected, and a total of 98 districts in 45 states participated, with a total usable sample of 555 surveys (Plake, 1993). The KR-20 reliability for the entire test was equal to .54 (Plake, Impara, & Fager, 1993). Teachers answered an average of slightly more than 23 out of 35 items correctly. The teachers' highest performance occurred on Standard 3-administering, scoring, and interpreting the results of assessments ($M=3.96/5.00$). The lowest performance occurred on Standard 6-communicating assessment results ($M=2.70/5.00$). On 10 of the 35 items, 90% or more of teachers answered the item correctly. These items addressed selecting appropriate assessments, acceptable test taking behaviour for standardised testing situations, explanation of the basis for the grade to a child's parent, and the recognition of unethical practices in standardized test administration. On 5 items, less than 30% answered correctly. Two of the five

came from Standard 5-Developing Valid Grading Procedures. Only 13% answered correctly an item that focused on steps to reliability of a test score. The two remaining items with low performance addressed Standard 7-Recognising Unethical or Illegal Practices. It was concluded in the study that teachers were not adequately prepared to assess student learning, as evidenced by the average score of 23 (66%) of 35 items answered correctly.

Daniel and King (1998), examined testing and measurement literacy of ninety-five elementary and secondary school teachers in the United States through a descriptive survey that described their knowledge of testing and measurement, their use of assessment strategies and their grade and content areas along with additional demographic. They found out that teachers' knowledge base regarding testing and measurement was somewhat inadequate, but the teacher regularly used the knowledge they did possess when assessing student progress. However, there were few differences between elementary and secondary teachers' knowledge and uses of assessment practices.

Quilter and Gallini (2000) explored teachers' assessment literacy and attitudes in Eastern Michigan University of USA. This study focused on the relationship between teachers' knowledge about educational assessment and their attitudes toward various forms of assessment. One hundred and seventeen in-service teachers responded to questions on a data collection instrument. Analytical methods used included canonical correlation and other correlational procedures. Results from the study indicate that knowledge about educational assessment is moderately related to current attitudes toward assessment. The implications of these results are considered within the context

of providing quality training in educational measurement for in-service teachers.

In Scotland, a qualitative study on teacher candidates' conceptualisations generally characterise graduates as less prepared for assessing student learning. Through her analysis of specifically prepared scripts from 30 novice teachers, MacLellan (2004) found that while teacher candidates were able to express various assessment purposes and formats, their articulation of assessment theory and related issues (i.e., reliability, comparability, validity, and fairness) were highly limited. MacLellan concluded that teacher candidates in her study maintained low levels of assessment literacy, which she cautioned could result in negative and detrimental classroom assessment practices. Significantly, MacLellan found that teacher candidates' knowledge in assessment was largely compartmentalised so that connections between formative (i.e., assessment for learning) and summative (i.e., assessment of learning) purposes of assessment were not well developed.

In Thailand, Yamtim and Wongwanich (2014) investigated the levels of classroom assessment literacy of primary school teachers and suggested a developmental approach for improving the classroom assessment literacy of primary school teachers in Wat Phai Rong Wua. The study sample consisted of 19 primary school teachers who completed the Classroom Assessment Literacy Questionnaire and 8 teachers who participated in a focus group discussion. Data were analysed by means of descriptive statistics and content analysis. The study findings revealed that most of the teachers had classroom assessment literacy at the low level. The approaches for improving the

classroom assessment literacy of primary school teachers should emphasise cooperative learning and teamwork, with knowledgeable persons acting as mentors or coaches who offer advice during teaching practicum.

Volante and Fazio (2007) explored more generally the assessment literacy development of primary/junior teacher candidates in a teacher education programme. Based on results from an assessment literacy questionnaire administered throughout the four year programme, the study noted that teacher candidates primarily referred to summative assessment activities (i.e., grading, tests, and report cards) in their responses, and to a much lesser extent, formative assessment activities (e.g., informal questioning, conversations, and conferences), presenting partial views of the role of assessment in teaching and learning. Candidates in this study emphasised the need for practical knowledge about assessment (i.e. assessment practices, tool development) and they overwhelmingly supported the notion of a specific course in classroom assessment and evaluation. The study also found that within their current model of assessment programming, candidates relied heavily on the mentorship of their associate teacher in aiding the development of their assessment literacy.

In China, a study of Chinese primary and secondary teachers' assessment literacy and its development was conducted by Zheng (2009). The author used a teachers' assessment literacy survey and administered it to 954 primary and secondary teachers working in Zhejiang Province, China using census. The questionnaire used in the study consisted of three sections, addressing background information of the instructors' experience (Part I), teachers' attitude toward assessment (Part II), and measurement of teachers'

levels of assessment literacy (Part III). The study found that the level of assessment literacy of those teachers in Zhejiang Province is quite low, even unacceptable. Based on the survey results and literature review, the researcher proposed a structural model of teachers' assessment literacy. The researcher also discussed the development of teachers assessment literacy should depend on the collaborative efforts of the government, school authorities and individual teachers.

In another study, Troudi, Coombe and Al-Hamly (2009) assessed English as First Language (EFL) teachers' views of English language assessment in higher education in the United Arab. The data was collected from 21 tertiary English Language Teachers (ELTs) through open-ended questionnaire. Purposive sampling technique was used to involve the participants in the study since it was an exploratory qualitative study. The study found that teachers often felt marginalised in the area of assessment because of their perceived lack of knowledge about the subject. There was a gap between teachers' philosophies and their practices. Overall, teachers were not involved in assessment-related decision-making processes. They had little voice in this important element of the curriculum and were marginalised within a top-down managerial approach to assessment. Most teachers wanted a more effective role and expressed frustration at being ignored.

In a related study, Kiomrs, Abdolmehdi and Rashidi (2011) conducted a study to isolate the effects of teachers' assessment literacy in moderating the washback effects of summative tests in the EFL context of Iran. A test of assessment literacy and a questionnaire on English language teaching practices were administered to 53 EFL secondary school teachers through purposive

sampling technique. The study found that the Iranian EFL teachers of secondary schools have a very poor knowledge base in language assessment. Further, due results show that no matter how assessment literate they are; they do tailor their English teaching and testing to the demands of external tests. However, more assessment literate EFL teachers seem to be more likely to include non-washback practices in their English teaching. The implications for teacher training and teachers' professional development programmes are then discussed.

In Malaysia, Sathasivam and Daniel (2011) conducted a study to ascertain the assessment literacy of selected Malaysian primary science teachers. The study employed qualitative data collection techniques as teacher journals and interviews with five primary school science teachers. The teacher journal required the participating teachers to pen down their knowledge, ideas and beliefs on assessment, feedback and theories/principles of assessment. The interview protocol consisted of open-ended questions where the researchers asked questions to clarify and to probe deeper into the responses that were written in the teacher journal. The findings showed that teachers' knowledge on assessment literacy stemmed more from the behaviourist perspective and that external examinations still dominated what drives teachers' ideas about their practices. It was also found that in-depth knowledge on how to conduct formative assessment practices were limited. The study indicated clear implications on how teachers would conduct their assessment practices in their classrooms and how their knowledge on assessment would affect their students' understanding of scientific concepts.

Perry (2013) explored the level of assessment literacy of high school principals in the state of Montana. An email was sent to all practicing high school principals (N=169) inviting them to participate in a survey. The survey asked demographic questions regarding years in the classroom, years as principal, overall education, size of school population, and region. The survey was also designed to test their level of assessment literacy using the Classroom Assessment Literacy Inventory (CALI) as used in similar studies. A total of 32 principals and 14 teachers completed the survey. The responses indicated that the level of teacher assessment literacy closely mirrored the results from studies conducted in 1993 and 2003 using the CALI. Findings included the level of teacher scores on the CALI have not changed significantly in over twenty years.

Piosang (2017) reported on the classroom assessment literacy of secondary English teachers (SET) and tertiary English teachers (TET). It specifically compared the level of assessment literacy of both groups. Classroom assessment literacy (CAL) was measured using Classroom Assessment Literacy Inventory (CALI). The results showed that teachers in basic education had higher means on assessment literacy than teachers in college, though, both have poor CAL (M=13.78, M=10.87). On the level of CAL, 85% of the SET group had poor CAL and 15% had fair CAL. For TET group, 88% had poor CAL, 5% had fair CAL, and 7% had good CAL. Results of t-test for independent samples showed that there is a significant difference between the level of classroom assessment literacy of SET and TET, $p=0.04$.

In Indonesia, Hudaya (2017) investigated teachers' assessment literacy in terms of teachers' preparation level in assessing students' performance,

teachers' practices in applying principles of language assessment in their classroom, and the usefulness of the questionnaire developed for them. Forty three in-service teachers were administered a 31 items questionnaire that covers principles of language assessment with 4points Likert scale, 3 open-ended question and 7 items of background questionnaire. The quantitative data were analysed by means of descriptive statistics in terms of percentage, mean, and standard deviation and the qualitative result were summarised, categorised and analysed for frequency of means. The results showed that 79% of teachers felt prepared in assessing students' performance, it was also revealed that, teachers' practices in applying the principles was (88.7% agree), and 86% teachers thought that the questionnaire that covers the principles of language assessment was useful for them to evaluate and/ or design a test.

In Nigeria, Kanu (2017) investigated the level of classroom assessment literacy of secondary school teachers in the Federal Capital Territory and suggested ways of improvement. The population of the study comprised senior secondary school in the Federal Capital Territory (FCT). Purposive sampling technique was used to select six (6) senior secondary schools from local government area councils in the FCT. Twenty teachers were selected from each school. A total of 120 teachers were randomly selected for the study. The instrument for data collection was a questionnaire of 22 items. Each of the items in the questionnaire was assigned a 4 point likert scale worded as: High Knowledge (HK) 4, Average Knowledge (AK) 3, Low Knowledge (LK) 2, and No Knowledge (NK) 1. Using a chronbach Alpha formular, a reliability coefficient ($r=0.75$) was obtained. Frequency count, weighted means, standard

deviation and percentages were used to analyse the data collected for the study. The findings revealed that most of the senior secondary school teachers in the Federal Capital Territory had classroom assessment literacy at an average level. The findings also revealed that lack of training and retraining/seminars are major barriers to teachers' classroom assessment literacy. It was therefore recommended that training and retraining programmes, workshops, seminars and symposia should be organised for teachers to update their professional status in order to effectively respond to the changing needs of new methods of classroom assessments. It was also recommended that formal training programmes for teachers should incorporate skills in assessment.

In Ghana, Amoako, Asamoah and Bortey (2019), investigated Senior High School (SHS) teachers' knowledge of formative assessment. Descriptive cross-sectional survey was the design employed for the study. Census approach was used to involve 148 mathematics teachers in the thirteen public SHS in the Cape Coast metropolis, Ghana. Questionnaire with closed-ended items was developed for the data collection. It was revealed that majority of SHS teachers in the Cape Coast Metropolis had low knowledge in formative assessment practices. Further, findings indicated a strong positive relationship between SHS mathematics teachers' knowledge of formative assessment and the practice of it. It was recommended that there should be regular workshop and in-service training programmes for SHS mathematics teachers on formative assessment practices by the Cape Coast Metropolitan Directorate of Education, Ghana Education service.

Professional Qualification in Education and Teachers' Assessment

Literacy

Specifically, in two separate studies, Mertler (2003, 2004) examined the differences between pre-service and in-service teachers regarding their knowledge of and perceived skills in educational measurement. Participants were 279 pre-service teachers and 233 in-service teachers from Oman. The pre-service teachers were surveyed at the end of semester course in educational measurement and the teaching experience of the in-service teachers ranged from 1 to 17 years. With an average of 7.10 and standard deviation of 4.70, majority of the in-service teachers ($n = 117$) have taken one course in educational measurement during their pre-service training. The study employed a self-report questionnaire with data analysed using descriptive statistics of means and standard deviations. He found that, despite their recent completion of educational measurement coursework, pre-service teachers demonstrated a lower level of assessment literacy than in-service teachers. These studies suggest that the professional preparation of teachers in educational measurement should receive considerable scrutiny. In addition, the aforementioned research points to a conclusion that the inadequate level of assessment competency seems to apply equally to in-service and pre-service as well as novice and experienced teachers across a range of contexts and subject domains.

In Columbus, Melter (2005) surveyed both pre-service and in-service teachers with respect to their assessment literacy. The group of pre-service teachers comprised of 67 undergraduate students (science, and social studies) at a Midwestern university and 101 in-service teachers (representing nearly

every district and school in a three-county area surrounding the same institution). The schools were selected based on convenience due to their geographical location. All secondary grade levels were represented in the final sample. In order to measure and compare preservice and in-service teachers' "assessment literacy," both groups were surveyed using the Classroom Assessment Literacy Inventory (CALI), which was designed to parallel the Standards for Teacher Competence in the Educational Assessment of Students. The study found that in-service teachers performed highest on Standard 3 (administering, scoring, and interpreting the results of assessments) and lowest on Standard 5 (developing valid grading procedures). Preservice teachers performed highest on Standard 1 (choosing appropriate assessment methods) and lowest on Standard 6 (communicating assessment results). Comparisons between the two groups revealed significant differences on five of the seven competency areas, as well as on the total scores. In all cases where significant differences were found, the in-service teachers scored higher than their preservice counterparts.

Motovu and Zubairi (2013) analysed the lecturers' self-perceived competencies and practices in assessing students. A modified Assessment Practices Inventory was administered to a sample of 329 randomly selected lecturers from six universities in Uganda. Factor analysis and multivariate analysis of variance (MANOVA) were used to analyse data gathered. The results of factor analysis yielded a factor structure of four variables; design, administration, interpretation, and application. The MANOVA multivariate test results highlighted differences in assessment competencies and practices among lecturers in the different academic levels and in the interaction between

type of university, specialisations, and academic levels. The Tukey HSD post hoc test results revealed that lecturers in the specialisation of education were different from their counterparts in other specialisations, in interpreting assessment results. Academic levels differences existed in all the dependent variables (design, administration, interpretation, and application). No difference existed in assessment competencies and practices between lecturers in the different types of universities. Lecturers have been found to differ in their assessment competencies and practices, according to their specialisations and academic levels. It was therefore recommended that, assessment training programmes be made mandatory to all lecturers in universities, in order to bridge the gap in their competencies and practices in assessing students.

In Iran, Amirian, Pourfarhad and Nafchi (2016) investigated the effectiveness of teachers' assessment. The result shows that those teachers who received the literacy of the International English Language Testing System (IELTS) writing assessment procedure have earned consciousness of the genre principles and are more successful in their profession as they are capable of producing more literate learners, who achieves higher scores than their fellow candidates without literacy in IELTS. These teachers were chosen from a shortlist of 20 candidates willing to teach in IELTS preparatory courses for students who wish to master their language skills for the IELTS exam. The findings of the study reveal that assessment literates tend to communicate their knowledge through a more effective approach to their students than their colleagues, emphasising the fact that teachers who try to secure their profession in an optimal manner should equip themselves with the needs of the assessment.

Schafer and Lissitz (1987) conducted a survey to determine their requirements for educating students in the area of measurement. The study used survey design and data were collected from 438 of 707 American Association of Colleges for Teacher Education (AACTE) member institutions using questionnaire. The authors found that more of the programmes surveyed do not require a formal certification in measurement. The teachers were ill-prepared in the area of student assessment. They further indicated that there should be a little change in the proportion of teacher education programmes requiring an assessment course. Many of the institutions suggested measurement is covered in other courses that are required in their programmes, but the authors questioned the value of measurement being taught incidentally and/or by professors who lack specific expertise in measurement.

In USA, Wise, Lukin and Roos (1990) conducted a study to explore teacher beliefs about training in testing and measurement. Three hundred ninety-seven teachers completed a survey of their formal measurement training, their beliefs about the adequacy and importance of their training, influences on their measurement knowledge, and their perceived abilities in measurement. Simple random sampling technique was used in selecting the respondents. The study found that about half of the teachers they surveyed nationally felt their measurement training was inadequate. One reason for this lack of confidence by teachers about their competencies in assessment is that teacher pre-service training programmes often provide only limited exposure to coursework or experiences in testing and educational measurement.

In Nigeria, Ololube (2008) evaluated test construction skills of professional and non-professional teachers in Nigeria. The study examined the relationship between professional and non-professional teachers' evaluation competencies and its impact on testing complexities and student academic achievement in Nigeria. A simple questionnaire incorporating multiple statistical procedures was fashioned containing a range of questions that elicited information from 300 respondents on their perception of teachers' evaluation competencies. The study found that professional teachers tend to construct effective evaluative instruments more than the non-professional teachers. It was also found in Ololube's study that professional teachers have the propensity to employ the various assessment techniques correctly, which unlikely do not happen in the case of non-professional teachers. Further, suggestions regarding measures that could help improve the employability of teachers were succinctly discussed.

Years of Teaching and Teachers' Assessment Literacy

In Oman, Alkharusi, Kazem and Al-Musawai (2011) investigated differences between pre-service and in-service teachers' knowledge of, perceived skills in, and attitudes toward educational measurement. Participants were 279 pre-service teachers and 233 in-service teachers from Oman. Census was conducted among pre-service and in-service teachers. The study found that in-service teachers had a lower level of knowledge, in educational measurement than pre-service teachers. In addition, the results not only testified to the value of pre-service measurement training, but also showed the merit of teaching practicum and teaching experience when preparing teachers in educational measurement.

Alkharusi (2011a) analysed the internal and external structures of the teacher assessment literacy questionnaire (TALQ). Preservice teachers (N = 259) enrolled in an educational measurement course at Sultan University in Oman, completed the TALQ using simple random sampling technique. The internal structure was explored through item analysis and reliability analysis. The external structure was explored through confirmatory factor analysis, regression analysis, and correlational analysis. The study found that in-service assessment training and teaching experience correlated positively with educational assessment knowledge. A significant positive relationship was also found between TALQ's scores and academic achievement scores in the course. Percentile ranks were extracted as norms for the raw scores of the sample on the TALQ. These results indicate that the TALQ provides valid and reliable score interpretations of the assessment literacy of the preservice teachers in Oman.

Alkharusi, Aldhafri, Alnabhani and Alkalbani (2012) explored attitudes, competence, knowledge, and practices of teachers about educational assessment. Participants were 165 in-service teachers teaching various subject areas in grades 5 to 10 randomly selected from Muscat educational governorate in the Sultanate of Oman. The study employed a descriptive survey research design and participants were selected using simple random sampling technique. The study found that teachers perceived themselves as being competent in educational assessment. Teachers used a variety of assessments in the classroom primarily for assigning grades and motivating students to learn, with some variations by gender, grade level, and subject

area. Teaching load and teaching experience accounted for some of the variations in teachers' educational assessment practices.

In a more recent study, Crusan, Plakans and Gerbil (2016) in USA examined second language teachers' knowledge, beliefs, and practices of writing assessment literacy. The study used 702 second language writing instructors from tertiary institutions. Data were collected with a 54-item survey instrument administered through Survey Monkey. Items were formulated to ascertain teachers' backgrounds and perspectives on assessment using multiple choice, Likert-scale, and open-ended response items. The study showed more positive picture with regard to assessment, especially in writing assessment. Another interesting finding is that more experienced teachers, reported less assessment knowledge and less experienced teachers reported higher assessment knowledge than teachers with 11-20 years of teaching experience. Although the reason of this was unclear, they suggested that it may be caused by the changes over time in pre-service teacher education or the presence or absence of in-service training. Teachers reported training in assessment during graduate training, workshops and conference presentations; to nearly 26% of teachers have little or no training at time of this survey. The results also showed relative effects of linguistic background and teaching experience on teachers' assessment knowledge, beliefs, and practices.

In China, Chen (2005) investigated graduate and undergraduate teacher candidates' assessment literacy by identifying the extent to which assessment standards were met. Participants' teaching experiences were also examined for their influence on level of assessment literacy. Data was collected from 61 teacher candidates at undergraduate and graduate levels who participated in an

explicit measurement course using census survey. Results showed that graduate teacher candidates had higher assessment literacy than undergraduate teacher candidates, and those with prior teaching experience demonstrated higher assessment literacy. Participants were found to have the most difficulty with communicating the assessment results to others such as parents, school personnel, and students. The study also found increased confidence in assessment of respondents.

How Teachers Follow Principles of Constructing Multiple-Choice Tests

Siddiqui (2018) investigated the frequency of errors in the construction of multiple-choice questions used for the assessment of Para-clinical sciences in medical course at the University of Western Australia. In the study two hundred and ninety (290) questions were reviewed to examine if they adhere to the uniformly accepted guidelines for writing multiple-choice questions. Of these, one hundred and fifty-one questions were already administered in examination so performance of distracters in those questions was also reviewed in addition to the guidelines for the construction of the questions. Results revealed that 38% of the reviewed questions did not adhere to general guidelines for their construction and 12% had more than one error. The study was concluded with a number of flaws identified after the review process which raises doubt about the use of objective test items as a true indicator of students learning. The review has led to changes in the assessment of policy at the faculty level and pre-examination reviews have been introduced to identify any flawed items before their administration in the examination. Regular series of workshops on item writing and item analysis was also arranged and

Faculty Teaching and Learning Grant were provided to create online resources.

Rush, Rankin and White (2016) evaluated faculty-authored examinations to determine the impact of item-writing flaws and item complexity on the difficulty and discrimination value of examination items used to assess third year veterinary students - Manhattan University, USA. One thousand, nine hundred twenty-five (1, 925) examination items prepared by clinical faculty for third year veterinary students were evaluated. The result revealed a mean (\pm SE) per cent correct ($83.3\% \pm 17.5$) was consistent with target values in professional education, and the mean discrimination index (0.18 ± 0.17) was slightly lower than recommended (0.20). More than one item-writing flaw was identified in 37.3 % of questions. The most common item-writing flaws were awkward stem structure, implausible distractors, longest response is correct, and responses are series of true-false statements. Higher cognitive skills (complexity level III-IV) were required to correctly answer 38.4 % of examination items. As item complexity increased, item difficulty and discrimination values increased. The probability of writing discriminating, difficult examination items decreased when implausible distractors and all of the above were used, and increased if the distractors were comprised of a series of true/false statements. Items with four distractors were not more difficult or discriminating than items with three distractors. The study was concluded with a recommendation of preparation of examination questions targeting higher cognitive levels which will increase the likelihood of constructing discriminating items. Also, the use of implausible distractors to

complete a five-option multiple choice question does not strengthen the discrimination value.

Siegel (2015) examined issues related to the use of teacher developed MCQ examinations as the only method of student assessment in the theory component of nursing courses. The National League for Nursing Core Competencies for Nurse Educators and the revised Bloom's Taxonomy were used as the conceptual frameworks for this study. Data was collected from nursing programme director and 9 faculty members of the Walden University to explore their perspectives on teachers developed MCQ. Data were collected from a review of documents, 2 focus groups, faculty-maintained diaries, and an interview. Analysis revealed the key findings as using a single method (MCQs) alone to assess student learning limited the opportunity for formative assessment, the ability to assess higher order thinking, and the development of metacognition on the part of students. To assist faculty in creating assessments of student learning that would address these themes, a 3-day faculty professional development project followed by 4 monthly lunches and learn sessions was designed. Providing additional faculty development in assessment methods may promote positive social change as it may ultimately increase the retention of qualified students to meet the demand for registered nurses within the community.

In Ghana, Cobbinah (2016) investigated impact of items' sequencing on difficulty level and students' achievement in Mathematics test in Cape Coast Metropolis of Central Region, Ghana. An attempt was made to find out whether item difficulty index and item ordering of the W.A.E.C multiple choice test items has influence on Senior High Students achievement in Core

Mathematics. The quasi-experimental design was adopted for the study. Purposive sampling technique was used to select six (6) schools comprised of 250 form two students from six intact classes in the Central Region of Ghana. Forty Core Mathematics multiple choice items were adapted from W.A.E.C past questions. Item difficulty index was carried out. Both one and a two-way analysis of variances were used. The result established that change of item order in multiple-choice test construction had significant effect on SHS students' achievement in Core Mathematics. Based on these findings it was suggested that W.A.E.C. should consider only one format to be used in their examinations or equivalent/parallel test and again teachers and examination officers should be educated on the psychometric properties of test and the effect it has on item ordering.

Ollennu and Etsey (2015) investigated the impact of item position in multiple-choice test on student performance at the Basic Education Certificate Examination (BECE) level in Ghana. The sample consisted of 810 Junior Secondary School (JSS) Form 3 students selected from 12 different schools. A quasi-experimental design was used. The instrument for the project was a multiple-choice test consisting of 40 items in each of English Language, Mathematics and Science. The items were arranged using the difficulty order to obtain the three treatments i.e. Random (RDM), Easy-to-Hard (ETH) and Hard-to-Easy (HTE). The data collected were subjected to statistical analysis using ANOVA at a significance level of .05. The results of the analysis indicate that for English Language, Mathematics and Science at the BECE level, when item order was altered, the difference in performance was statistically significant. The study led to the conclusion that the proposition of

using re-ordering of items of an objective test to curb examination malpractice may not be the best after all especially in English Language, Mathematics and Science at the BECE level. It was therefore recommended that other methods should be investigated for the purpose.

Teachers' Competencies in Assessment Practices

The competency in test construction is an essential tool needed by every teacher if learning and instructional objectives are to be effectively attained. Teachers' assessment competencies (skills) are very important for students' assessment. Teachers' knowledge and skills in educational measurement have been equated to assessment literacy (Brookhart, 2001; Campbell, Murphy, & Holt, 2002; Mertler & Campbell, 2005; Popham, 2006). Conversely, significant studies reported varied findings about teachers' assessment competencies.

In USA, Brookhart (2001) did a Meta study and summarised well-reviewed research about teacher competence in the skills described in the "Standards for Teacher Competence in the Educational Assessment of Students." The also examines additional research studies from 1990. The standards emphasise: choosing and developing assessment methods appropriate for instructional decisions; administering, scoring, and interpreting the results of externally produced and teacher produced assessment methods, using assessment results when making educational decisions; developing valid student grading procedures which use assessments; communicating assessment results to students, parents, and other lay audiences and educators; and recognising unethical, illegal, and otherwise inappropriate assessment methods and uses of information. Three methods have been used to investigate

teachers' knowledge and use of assessment: surveys of teacher attitudes, beliefs, and practices; tests of assessment knowledge; and reviews of teachers' assessments themselves. Teachers appear to do better at classroom applications than at interpreting standardised tests. They lack expertise in test construction, and they do not always use valid grading procedures. Few teachers provide criteria for grading or examples of student work ahead of time, and few involve students in creating criteria. Most studies have concluded that teachers need more instruction in assessment.

Campbell, Murphy, and Holt (2002) administered a scenario-based version of the teacher competencies assessment questionnaire (TCAQ) to 220 undergraduate students who had enrolled in a teacher education measurement course. The study respondents were selected using simple random sampling technique. Questions on the TCAQ were based on the Standards for Teacher Competency in Student Assessment which articulated seven principles related to assessment selection, design, administration, scoring, and interpretation. The study found that teacher candidates' confidence differed across the seven principles, with teacher candidates most confident on standard one (i.e., choosing appropriate assessments to measure student learning) and least confident on standard six (i.e., communicating results to educational stakeholders).

In Canada, Mertler and Campbell (2005) measured teachers' knowledge and application of classroom assessment concepts. In an effort to measure teachers' "assessment literacy," an instrument, titled the "Assessment Literacy Inventory (ALI)," was developed and its psychometric properties evaluated. The "ALI" was designed to parallel existing "Standards for Teacher

Competence in the Educational Assessment of Students." A two-stage pilot test of the instrument was conducted with 152 preservice teachers and 249 preservice teachers. Item analyses of the second-stage pilot data revealed an overall instrument reliability (KR20) of 0.74. Individual item analyses (i.e., item difficulties and item discriminations), as well as other indices, were examined. Recommendations for future research include content and construct validation of the "ALI" as well as an investigation of the appropriateness of the "ALI" as a measure of in-service teacher assessment literacy. Finally, the "Assessment Literacy Inventory" provides a practical mechanism for educators to measure assessment literacy. Considering the current state of high-stakes accountability in education, the "ALI" could provide school districts an effective, as well as efficient way to allocate resources for developing or otherwise selecting teacher professional development opportunities on the topic of classroom assessment.

Using a parallel mixed-methodology approach, Ogan-Bekiroglu (2009) examined attitude towards and competence in educational assessment of 46 Turkish teachers who completed an educational assessment course. This paradigm combined both qualitative and quantitative methods to give both breadth and scope to the research. Census was conducted on all 46 Turkish teachers. The study revealed that teachers had a high sense of competence about educational assessment, but had some difficulties related to their assessment practices. School policy and facilities were considered as difficulties negatively affecting teachers' use of alternative forms of assessments. The study concluded that teachers' knowledge and attitudes

related to the educational assessment should be taken into account when introducing reforms in the educational systems.

In Botswana, Koloi-Keaikitse (2012) examined the discrepancies between teachers' perceived skill and use of classroom assessment practices. The Classroom Assessment Practices and Skills (CAPS) questionnaire was administered to a sample of 691 primary and secondary school teachers in Botswana, Southern Africa to survey their thoughts about classroom assessment and identify classroom assessment practices teachers perceive to be skilled and those that they used most. The study respondents were selected using simple random sampling technique. Botswana teachers held positive beliefs about both mastery and performance orientations to student assessment. Teachers were unsure about the adequacy of their assessment training, but indicated that they needed further training in assessment. The results also showed that primary teachers, particularly those with only a certificate needed more skill training in assessment applications, statistical applications, and criterion referenced testing. The more experienced teachers were, the more they agreed with mastery and performance orientations, and the more they had perceived skill and use of desirable classroom assessment practices. Factors were related to teacher characteristics of educational level, subject taught, teaching level, years of teaching experience and assessment training. The results showed that, including more courses in assessment during teacher training and sending teachers for in-service or workshops in assessment helped to improve their perceived beliefs, skills, and use of desirable classroom assessment practices. Understanding the beliefs teachers hold, particularly about students' performance, can be used as a framework for

identifying educational resources meant to help both schools and students to perform. If policy makers are aware of teachers' beliefs regarding mastery, they can help teachers to formulate assessment practices that promote critical thinking skills and mastery. A mentoring programme to match new and experienced teachers to share reciprocal knowledge and skills on classroom assessment practices can be developed in schools. Teacher educators may consider overhauling their programmes to have courses that are more focused on assessment, or increase the number of assessment courses for preservice teachers. Teachers should be sent for in-service training in assessment on a regular basis to ensure that they maintain current classroom assessment skills.

In Ethiopia, Bedilu (2014) assessed the competence of secondary school teachers in the educational assessment of students among secondary schools in Bahir Dar town. To do so, a sample of 60 secondary school teachers in Bahir Dar town was used. Adapted questionnaire was used to collect data. The questionnaire was composed of 31 multiple-choice items used to assess teachers' competence in the educational assessment of students. Descriptive statistics and t-test was used to analyse the data collected from the field. It was found out that teachers participating in this study demonstrated knowledge rated below average in the educational assessment of students.

Tagele and Bedilu (2015) assessed secondary school teachers' competence in the educational assessment of students in Amhara National Regional State, Ethiopia. Data was collected using a modified form of the "Teacher Assessment Literacy Questionnaire," a four-option multiple choice test from 814 teachers. The questionnaire consisted of seven competence areas and a total of 31 items. Means and standard deviations, and proportion

(percentage) were used to describe the collected data. Moreover, t-test and one-way ANOVA and repeated measures ANOVA were used to analyse the data. The result showed that secondary school teachers in Amhara National Regional State failed to demonstrate competence in the educational assessment of students. They failed to demonstrate competence in the overall and in each of the seven standards of educational assessment of students. The t-test showed that those who took a separate course in measurement and evaluation during their training scored statistically significantly higher than those who did not take a course in measurement and evaluation with mean of 1.28 points greater.

In Ghana, Wiredu (2013) examined the assessment practices of tutors in the nurses' training schools in Western and Central Region of Ghana. The study sought to find the assessment practices of tutors with effect of tutor academic qualification and years of teaching on assessment practices (planning, construction, evaluation, administration, scoring and feedback) in the different nursing schools. Descriptive survey, where the whole accessible population was involved in the study (census) was conducted. The instruments used in the data collection were a likert scale questionnaire and observation checklist. Results from the study indicated that 68.75% of the respondents had a certificate in professional education and also have teaching experience of between 0 – 7years. The number of years of teaching had a higher influence on assessment practices than the professional qualification in education. Statistically, there was no significant difference in the knowledge of all tutors in assessment in the different schools. However, a significant difference in the

assessment practices of the tutors existed in terms of all the indicators used except with test administration.

Chapter Summary

The literature was guided by classical theory and with the concept of assessment and assessment literacy discussed. The review further addresses the research questions and hypotheses guiding the study with the following sub-headings:

- a. Teachers' Assessment Literacy
- b. Professional Qualification in Education and Teachers' Assessment Literacy
- c. Years of Teaching and Teachers' Assessment Literacy
- d. How Teachers Follow Principles of Constructing Multiple-Choice Tests
- e. Teachers' Competencies in Assessment Practices

The empirical evidence on teachers' assessment knowledge revealed contradictory views on assessment literacy of teachers. The evidences point to the fact that teachers possess moderate to high assessment knowledge with other authors stating a low or rather an inadequate assessment literacy of teachers. The confirmation or otherwise of either professional qualification in education and years of teaching have any sway on assessment literacy was empirically confirmed as positive.

Lastly, previous works examined in relation to how teachers' follow principles of constructing multiple-choice tests appears to show that, mostly classroom teachers do not follow principles of test construction. These findings therefore, gives the impression that few classroom teachers or

educators understand the importance of effectively using assessment to promote and improve students' learning and performance, analyse and make decision with assessment data, knowledge and competences in educational assessment. It is against this background that this study intended to examine the assessment literacy of nursing tutors in Central, Region of Ghana.



CHAPTER THREE

RESEARCH METHODS

Introduction

The main purpose of the study was to examine the assessment literacy of nursing tutors in Central Region of Ghana. This chapter deals with methodology used in the study. It comprises of research design, study area, population, sample and sampling procedures, data collection instrument, validity and reliability, data collection procedures, data processing and analysis.

Research Design

Descriptive, cross-sectional survey rooted in quantitative approach was adopted for this study. Descriptive research survey enables the researcher to describe, find out and interpret conditions, events and trends that are developing (Oke, 2005). According to Neuman (2000), cross-sectional surveys are appropriate for situations where the data to be collected are about self-reported beliefs or behaviour. Bamidele (2004) also described it as an attempt which aims at describing systematically facts and characteristics in a factual and accurate manner.

This research design is the most desirable because the study it describes the current situation of classrooms in terms of nursing tutors' knowledge and competencies in assessment as well as the principles adhered to in constructing multiple choice items. Besides, it aids in collecting data and comparing many different variables at the same time without manipulating the study environment. Descriptive design provides a meaningful picture of events

and seeks to explain the knowledge that tutors have on assessment on the basis of information obtained at a point in time. In addition, descriptive design can be used with greater confidence with regards to particular questions which are of special interest and important to the researcher.

It must however be noted that despite the strengths of descriptive designs, the design has its shortcomings: Participants or respondents may not be truthful or may not behave naturally when they know they are being observed. Descriptive studies do not determine cause and effect, and researcher bias. For example, the choice and wording of questions for the questionnaire may be influenced by the bias of the researcher.

Study Area

The Central Region is one of the sixteen (16) administrative regions of Ghana. It is bordered by Asante and Eastern regions to the north, western region to the west, Greater Accra to east and to the south by the Gulf of Guinea. The region is noted for its many elite higher education institutions and an economy based on an abundance of industrial minerals and tourism. Amidst these renowned higher institutions is the nursing and midwifery training institutions as well. The study employed all health tutors in the five (5) public and midwifery institutions which are distributed within the various district of the region. The total number of health tutors was 183 with most of them as nurses or midwives with or without professional qualification in education, with others also holding professional background certificate in nutrition, environmental and personal hygiene and disease control. There was also some other health tutors without any health-related background. However, these tutors possessed certificates and degrees in other programmes

(Computing, African Studies, Sign Language and Statistics) from various universities.

Population

The population for the study consisted of all nursing (health) tutors in five (5) public nursing training colleges in Central Region of Ghana. The total number of tutors was 183. This includes, 36 health tutors at Ankaful Nurses Training College, 46 health tutors at Cape Coast Nursing and Midwifery Training College, 32 health tutors at Winneba Community Nursing Training College, 38 health tutors at Twifo Praso Nursing and Midwifery Training College and 31 health workers at Dunkwa-On-Offin Nursing and Midwifery Training College (see Table 1).

Sample and Sampling Procedures

The sample frame for the study was all nursing (health) tutors in five (5) public nursing training colleges in Central Region of Ghana, with a total of 183 tutors (see Table 1).

Table 1 – *Population Distribution of Respondents*

Nursing Training Colleges	Population
Ankaful Nurses Training College	36
Cape Coast Nurses Training College	46
Winneba Community Nursing Training College	32
Twifo Praso Nurses Training College	38
Dunkwa - On-Offin Nurses Training College	31
Total	183

Source: Nursing and Midwifery Council of Ghana (NMC-G), 2018

Amedahe and Asamoah-Gyimah (2017) indicate that a sample is mostly used when, first, the population is very large and complete coverage

may not be possible, and also when complete coverage may not offer substantial advantage over a sample survey. However, in this study, the population (183) was not large and for that matter a complete coverage was possible. In view of that, the census method was employed to select all 183 tutors in five (5) public nursing training colleges in Central Region. This method is very advantageous in the sense that it helps increase generalisations of the findings.

Data Collection Instrument

A questionnaire was used to collect primary data from the respondents. Per the nature of the study, the questionnaire was the structured type and was designed in three (3) sections. The first section, Section 'A' looked at the background information of the respondents. Information such as gender, age, professional qualification in education and years of teaching were solicited. Section 'B' was made up of 30 items with a dichotomous response (True/False). This helped to gather information on assessment literacy. This section of the questionnaire was designed in line with the Standards for Teacher Competence in Educational Assessment of Students put forward by the National Council on Measurement in Education, and the National Education Association (1990). These standards are seven in number, explain in detail from page (34-38) of this work, however, for this study the standards were basically summarised around, planning and construction of classroom assessment; administration, scoring and use of assessment results; and ethical and legal issues in assessment.

Section "C" looked at the principles that tutors follow in constructing multiple-choice test items. This section of the questionnaire was adapted from

Test Construction Skills Inventory (TCSI) developed by Ngozi, Chika, and Aloysius (2013) in Nigeria. The inventory has 25 items with a 4-point scale with the following options: strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD). For the purpose of this study, 20 of the items were adapted. This is because these 20 items relate directly with the construction of multiple-choice items. In addition, the response format was changed to never (N); not often (NO), often (O), very often (VO), and always (A) in order to determine the extent to which tutors follow the principles.

Questionnaire is among the most widely used instruments in research studies (Nwadinigwe, 2002). Questionnaire was preferred because it is easy to administer to the respondents and convenient for collecting information (Cohen, Manion, & Morrison, 2007). In addition, the respondents were literate and therefore familiar with the language in the questionnaire. They are very useful for gathering large-scale information regarding different kinds of issues (Oppenheim, 2000; Richards, 2001; Robson, 2002).

Meanwhile, Seifert and Hoffnung (1994) posited that using questionnaire to solicit answers to questions can result in a varied response depending greatly on the wording of the questions. It may also produce untrustworthy results since some of the questions could be too private and respondents could decide not to be vividly truthful of answer. They further stated that questionnaires require respondents that can articulate their thoughts well, as well as putting such thoughts into writing. There is also a possibility of getting a very low return rate of questionnaires administered for a meaningful analysis to be made.

Validity and Reliability Evidence

In order to ensure face and content validity of the instrument, experts' opinions were sought from the supervisors, lecturers, and peers. Consultations with the supervisors, other lecturers, and peers helped to identify errors and offer the opportunity to modify and improve the instrument. To ensure that the items in the questionnaire fully represent the research questions, extensive literature review was done. Also, to ascertain the validity and reliability of the research instrument, a pilot test was conducted in two public nursing training colleges in Western Region of Ghana.

Pilot testing

The study used 30 health (nursing) tutors in Sekondi Nurses & Midwifery Training College and Community Health Nurses Training College, Esiamia for the pilot test. This number of health tutors was sampled through simple random sampling and the choice of the health tutors from the above nursing institutions because they possessed the same characteristics (nurses, midwives and others from other health-related background with or without professional qualification in education) as the respondents for the main study. Literature suggests that a pilot testing sample should be 10-20% of the sample projected for the larger parent study (Connelly, 2008).

The reliability of the questionnaire was determined using Kuder-Richardson 20 and Cronbach's alpha coefficients. As prescribed by Nunnally and Bernstein (1994), the general convention is to strive for reliability values of 0.7 or higher. The KR-20 of the assessment literacy questionnaire was .62 and the cronbach's alpha for the principles of constructing multiple-choice test items was .78.

Reliability after the main data collection

After the main data collection, reliability analysis was done. The KR-20 of the assessment literacy questionnaire was .68 and the cronbach's alpha for the principles of constructing multiple-choice test items was .84.

Data Collection Procedures

Ethical considerations were duly followed before the data collection. First, an introductory letter was taken from the Head of Department of Education and Psychology, University of Cape Coast. The letter was then sent to the principals of the five (5) public nursing training colleges in Central region of Ghana to seek permission for the data collection. The purpose of the study and the introductory letter were explained to the college principals. The introductory letter helped to establish rapport between me and the respondents.

Secondly, an ethical clearance from the Institutional Review Board (IRB) – College of Education, University of Cape Coast was taken and sent to the Nursing Midwifery Council of Ghana and Head of academic in all five (5) public nursing training colleges in Central region of Ghana to seek permission for the data collection. All the participants were also entreated to sign a Consent form. The aim of the consent form was to help reassure participants that their participation in the research was voluntary and that they were free to withdraw from it at any point and for any reason. Next to this, I fully informed participants regarding the objectives of the study, while they were reassured that their answers would be treated confidentially and used only for academic purposes and only for the purposes of this particular research.

Also, participants were told that they would not be harmed or abused, either physically or psychologically, during the conduction of the research. I

attempted to create and maintain a climate of comfort. The questionnaire was administered to 183 respondents from the five (5) public nursing training colleges in Central Region of Ghana. The respondents were given two-three (2-3) working days to complete the questionnaire. The data collection took a period of one month (February, 2019). At the end of the data collection, 171 representing 93.4% questionnaire were retrieved as the return rate.

Data Processing and Analysis

The data collected was edited, coded and keyed into statistical software called Statistical Package for Social Sciences (SPSS) for processing. The data was analysed using descriptive (frequency, percentages, means and standard deviation) and inferential statistics (independent-sample t-test and one-way ANOVA) at 0.05 alpha level of significance.

Data collected on Research Question 1 was analysed using frequencies and percentages. First, all the items were dichotomously scored as 0 or 1. A point of zero (0) was awarded to wrongly answered items, while correctly answered items were scored 1. A total score was computed for all the 30 items. Based on this, the score for each respondent ranged from 0 to 30. Scores from 0 to 10 was considered low level of knowledge, scores from 11 to 20 was considered as moderate knowledge, while scores from 21 to 30 was considered high knowledge level.

Data on Research Question 2 was analysed using mean and standard deviation. The responses to each item were scored never = 1; not often = 2, often = 3, very often = 4, and always = 5. The mean of the items was estimated, thus, $(1+2+3+4+5)/5$. In interpreting the items, the mean score was ranged from 1 to 5, such that the higher the mean score, the more respondents

adhered to the given principle, and vice versa. Finally, the mean of means was computed, and this followed the same interpretation as indicated earlier.

Research Hypotheses 1 was tested using the two sample independent t-test. This statistical procedure was used because the hypothesis aimed at determining differences in the mean score of respondents' assessment literacy. The dependent variable (knowledge in assessment) was scored on continuous basis. The independent variable (educational qualification) had two levels (degree with education and degree without education). Assumptions such as normality and homogeneity of variance was checked and adhered to before proceeding with the analysis. Post hoc analysis was conducted where significant difference was found.

Hypothesis 2 was tested using the one-way analysis of variance (ANOVA). The one-way ANOVA was used to determine whether there were any statistically significant differences among the mean scores of respondents' knowledge in assessment literacy. The independent variable (years of teaching) was categorised into four based on number tutor' first promotion period (1 – 3 years, 4 – 6 years, 7 – 9 years, and 10 years and above). All assumptions surrounding the use of one-way ANOVA that is, the independent variables were categorised, members of a group were independent of each other with one dependent variable (assessment literacy) and homogeneity in the variances between groups were checked and adhered to before proceeding with the analysis. Also, with the assumption of normality, the visual examination of the normal Q-Q plot (see pp. 102-104) indicated that the dependent variable was normal across the categories of years of teaching. Post hoc analysis was done where a significant difference was found.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The purpose of the study was to examine the assessment literacy and the adherence to the recommended principles in constructing multiple choice items of nursing tutors in the Central Region of Ghana. Data were collected from nursing tutors in five public nursing training colleges in Central Region. Questionnaire was used to gather data from the tutors. At the end of the data collection, 171 representing 93.4% of the questionnaire were duly completed and appropriate for data analysis. This chapter presents the results of the data collected from the field. The chapter was organised in two sections. The first section presented the demographic characteristics of the respondents, and the second section presented the main results based on the research questions and hypotheses.

Demographic Characteristics of Health Tutors

This section presents the results on the demographic characteristics of the respondents. The demographic information covered included gender, age, professional qualification, and years of teaching. The data was analysed using frequency and percentages and presented in Table 2.

Table 2 – *Demographic Profile of Health Tutors (n=171)*

Variable	Sub-scale	Frequency	%
Gender	Male	96	56.1
	Female	75	43.9
Age group	21 – 30 years	11	6.4
	31 – 40 years	126	73.7
	41 – 50 years	29	17.0
	51 – 60 years	5	2.9
Professional qualification	Degree with education	121	70.8
	Degree without education	50	29.2
Years of teaching	1 – 3 years	28	16.4
	4 – 6 years	85	49.7
	7 – 9 years	36	21.0
	10 years & above	22	12.9

Source: Field survey (2019)

Table 2 presents the results of health tutors concerning their background information. Concerning gender distribution, majority 96(56.1%) were males, while 75 (43.9%) were females. Generally, more than half of the respondents were males. This implies that males dominate among nursing tutors in Central Region.

Regarding age distribution, a vast majority 126 (73.7%) of the respondents were from the ages of 31 – 40 years, while few 5 (2.9%) were from 51 – 60 years. From the distribution, it can be said that majority of the respondents were young adults.

Based on professional qualification of respondents, a greater proportion 121 (70.8%) of the respondents had professional background in education, while 50 (29.2%) had no background in education.

Concerning the number of years of teaching experience, nearly half, 85 (49.7%) of the respondents had taught from 4 – 6 years and 36 (21%) had also taught for 7 – 9 years. Generally, it can be said that respondents are quite experienced. About 84% of the respondents had taught for more than 3 years.

Main Results

This part presents the main results of the study. The results are presented in line with the research questions and hypotheses.

Research Question One: What is the knowledge level of health tutors in classroom assessment in Central Region of Ghana?

This research question sought to determine respondents' level of knowledge in classroom assessment. Respondents were asked to respond to 30 True/False items, which solicited factual information on classroom assessment. The responses from the respondents to each item were scored as correct and incorrect and presented in frequencies and percentages. The correct scores represent the number and percentages of respondents who had an item rightly answered and the vice versa for the respondents who incorrectly scored an item. Tables 3 and 4 present the results on this research question.

As presented in Table 3, majority of the health tutors had adequate knowledge on assessment practices. Out of 30 assessment literacy questions, most of them had 22 questions correct. For example, out of 171 respondents, 165 (96.5%) of them correctly indicated that the most effective way to assess the logic students used to arrive at a conclusion is to provide them with a task that involves problem solving. In addition, majority 151 (88.3%) of the respondents correctly indicated that a tutor must write test so that both high and low achievers can understand. Also, concerning confidentiality of students' assessment results, majority (n=158; 92.4%) of the respondents correctly indicated tutors should be responsible for keeping students' assessment results confidential and to protect students' right to privacy.

In Table 3, Majority (n=170; 99.4%) of the respondents correctly indicated that tutors should ensure that assessment procedures used in class accommodate the needs of students with disabilities or special needs and they providing feedback on students’ assessment results (n=166; 97.1%). Also, tutors should interpret students’ performance on one assessment in the context of the learning objectives taught rather than using it as a weapon for punishing the students or controlling their behaviour (n=154; 90,1%).

Table 3 – *Classroom Assessment Literacy of Health Tutors (n=171)*

Statements	Correct Response	Incorrect Response
Planning and Construction of Classroom Assessment		
1. In choosing an assessment technique, it is best to consider the ease of preparing the assessment.	57(33.3)	114(66.7)
2. A tutor must prepare a marking guide after constructing the test items.	19(11.1)	152(88.9)
3. The most effective way to assess the logic students used to arrive at a conclusion is to provide them with a task that involves problem solving.	165(96.5)*	6(3.5)
4. A tutor must write test so that both high and low achievers can understand.	151(88.3)*	20(11.7)
5. The most effective way a tutor can assess students’ ability to put parts/pieces, arrange and combine to make a pattern is to use multiple-choice type test.	89(52.0)*	82(48.0)
6. Adding more items to the test increases the reliability of the test results.	52(30.4)	119(69.6)
7. To assess students' skills in organizing ideas rather than just repeating facts, it is best to craft items which demand students to ‘define, recall, restate’.	84(49.1)	87(50.9)
8. Scoring of essay tests is more objective than multiple-choice items.	116(67.8)*	55(32.2)
9. When constructing a test, a tutor should craft test items to cover all the requisite levels of cognitive domain.	155(90.6)*	16(9.4)
10. Tutors should use multiple assessments to assess amount of students’ learning.	160(93.6)*	11(6.4)
11. Assessment procedures used in class should accommodate the needs of students with disabilities or special needs.	170(99.4)*	1(.6)

Table 3 *Continued*

Administration, Scoring and Use of Assessment Results		
12. Students test scores are said to be reliable when they accurately reflect the content of what was taught.	17(9.9)	154(90.1)
13. Information on students' scores in quiz/class test can be used to modify instruction better than students' scores in end of semester examination.	135(78.9)*	36(21.1)
14. Test should be administered to students at any time even without their prior notice.	114(66.7)*	57(33.3)
15. When testing students, they should be allowed a lot of time.	70(40.9)	101(59.1)
16. Tests should be administered in well-lighted and well-ventilated rooms.	160(96.6)*	11(6.4)
17. Tests should be scored strictly according to the marking scheme.	110(64.3)*	61(35.7)
18. If the average score of students in a class is 65, Kweku who had a score of 80 could be referred to as perform excellently.	57(33.3)	114(66.7)
19. Ama can be referred to as an 'average' student when she performs better than more than half of her colleagues in the class.	115(67.3)*	56(32.7)
20. If a tutor wants to know how much a student has mastered some contents, it is best to describe his/her performance in relation to his/her peers.	105(61.4)*	66(38.6)
21. When grading students, tutors should primarily focus on students' scores on various assessments.	130(76.0)*	41(24.0)
22. Tutors should provide feedback on students' assessment to students.	166(97.1)*	5(2.9)
Ethical and Legal Issues in Assessment		
23. If a tutor wants to know whether students have mastered certain instructional objectives, it is best to assess students using test samples in textbooks	66(38.6)	105(61.4)
24. It is best to assess students when test items are selected from published textbooks or past questions.	152(88.9)*	19(11.1)
25. Assessment procedures should be free of gender, ethnic, social class, and religious bias and stereotypes.	151(88.3)*	20(11.7)
26. In scoring students' tests, tutors should be very hard on students who miss classes and be generous to students who are regular in class.	155(90.6)*	16(9.4)
27. Tutors should not provide feedback on student's assessment to other people without the consent of the student.	120(70.2)*	51(29.8)

Table 3 *continued*

28. Tutors should be responsible for keeping students' assessment results confidential and to protect students' right to privacy.	158(92.4)*	13(7.6)
29. Tutors need not obtain permission before using copyright materials in assessment.	109(63.7)*	62(36.3)
30. Tutors should interpret students' performance on one assessment in the context of the learning objectives taught rather than as a weapon for punishing the students or controlling their behaviour.	154(90.1)*	17(9.9)

Source: Field survey (2019)

The responses of the respondents to each item were firstly scored as 1 and 0 for correct and incorrect responses, respectively. Following this, the scores of the respondents ranged from 0 to 30. These were further categorised into three (scores from 0 to 10 was considered low level of knowledge, scores from 11 to 20 considered as moderate knowledge, while scores from 21 to 30 was considered high knowledge level of assessment), respondents fell within only the moderate and high assessment literacy as presented in Table 4.

Table 4 presents the frequency distribution of scores of respondents based on their assessment knowledge level.

Table 4– *Classroom Assessment Literacy of Health Tutors*

Assessment Literacy	Score range	Frequency	Percentage (%)
Moderate	11 – 20	56	32.7
High	21 – 30	115	67.3
Total		171	100.0

Source: Field survey (2019)

From Table 4, majority 115 (67.3%) of the respondents had high knowledge in assessment, while 56 (32.7%) had moderate knowledge in assessment. This can be concluded that majority of the respondents are classroom assessment literates.

Research Question Two: How do health tutors follow principles in writing multiple-choice items?

This research question sought to determine how health tutors follow principles in writing multiple-choice items. Respondents were asked to respond to 20 items on the principles of constructing multiple-choice test items using a 5-point Likert-type scale ranging from “Never to always”. The responses of the respondents were analysed using mean and standard deviation. The mean scores ranged from 1.0 to 5.0. A mean score of below 3 represents non-adherence to the principle (not followed), while a mean score of 3.0 and above represents principle either often or always adhered to (mostly followed). Table 5 presents details of the results.

Table 5– *Health Tutors’ Adherence to Principles in Constructing Multiple-choice Items (n=171)*

Items	<i>M</i>	<i>SD</i>	Remark
1. Prepare a table of specification first as a guide before writing the test items.	3.33	1.38	MF*
2. Write concise, easy to read and understand central issue of every item in the stem.	4.12	.99	MF*
3. Construct test items with credible distractors.	3.99	1.10	MF*
4. Write test items with answer to an item not dependence on the knowledge of the answer to a previous item.	3.40	1.33	MF*
5. Ensure that the stem and options of an item are both at the same page.	4.11	1.28	MF*
6. Construct items with expected response at the beginning of the stem.	2.36	1.31	NF**
7. Ensure options follow syntax and punctuation rules.	4.13	1.09	MF*
8. Ensure each item is made of only one correct or best response without specific clues.	3.87	1.28	MF*
9. Construct original items not items copied from textbooks or others’ past test items.	3.73	1.11	MF*
10. Write test items with ‘all of the above’ as an option.	2.16	1.29	NF**
11. Prepare test items with varied placement of correct options arranged alphabetically.	4.37	1.04	MF*
12. Write options that are similar in content for given item.	2.96	1.24	NF**

Table 5 *Continued*

13. Write options for given item with the same grammatical structure.	2.99	1.44	NF**
14. Write options without repetition of a particular word(s) for given item.	3.73	1.27	MF*
15. Construct items with consistent number of four or five options.	3.81	1.40	MF*
16. Write test items with items measuring opinions excluded.	3.06	1.51	MF*
17. Prepare responses in agreement itemized vertically.	3.91	1.22	MF*
18. Prepare items with the stem and options stated positively.	3.85	1.10	MF*
19. Write sentence responses in about the same length.	3.39	1.33	MF*
20. Construct each item with distinct options/alternatives.	3.89	1.21	MF*

Source: Field survey (2019); *MF – Mostly Followed; **NF – Not followed

As shown in Table 5, using a cut-off point of 3.5 and above as a median score representing a principle either often or always adhered to, an average score of 12(60%) of the 20 principles is adhered to mostly. For example, prepared test items with varied placement of correct options arranged alphabetically (M=4.37; SD=1.04), ensured that options follow syntax and punctuation rules (M=4.13; SD=1.09), they wrote concise, easy to read and understand central issue of every item in the stem (M=4.12; SD=.99), ensured that the stem and options of an item are both at the same page (M=4.11; SD=1.28), constructed test items with credible distractors (M=3.99; SD=1.10), prepared responses in agreement itemized vertically (M=3.91; SD=1.22), constructed each item with distinct options/alternatives (M=3.89; SD=1.21), ensured that each item is made of only one correct or best response without specific clues (M=3.87; SD=1.28), and prepared items with the stem and options stated positively (M=3.85; SD=1.10) as some of the principles

mostly followed. In all, it can be said that tutors follow 12 out of 20 recommended principles in constructing multiple-choice test items.

Hypothesis One: There is no significant difference in the knowledge level of health tutors on classroom assessment literacy with respect to professional qualification in education.

This hypothesis sought to determine differences in health tutors' level of knowledge in classroom assessment literacy based on their professional qualification in education. This hypothesis was tested using independent samples t-test. The independent variable was professional qualification in education, with two levels: those with education background and those without education background. The dependent variable was respondents' scores in classroom assessment literacy. Prior to testing this hypothesis, the normality assumption was checked. Figures 1 and 2 present the normal Q-Q plots.

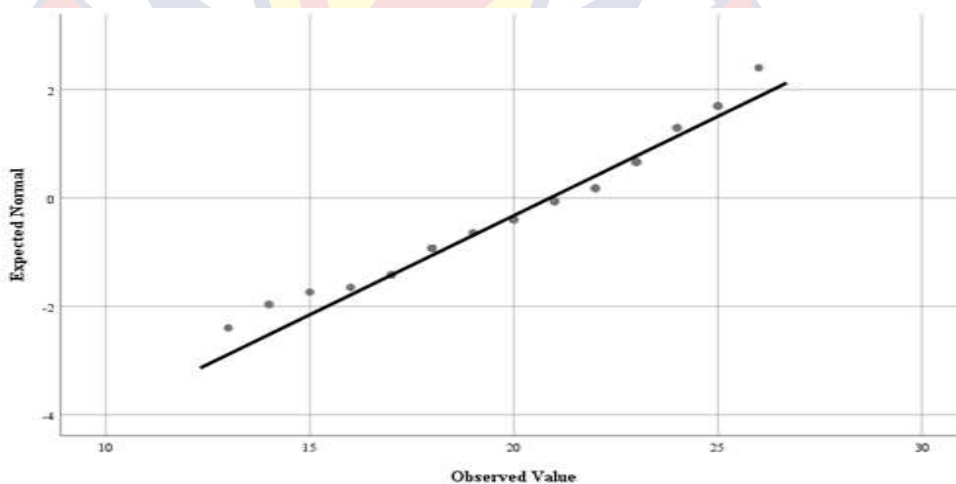


Figure 1- Normal Q-Q plot for professional qualification in education

As shown in Figure 1, the normal Q-Q plot shows that the distribution of assessment literacy scores among respondents with professional qualification in education was normally distributed, since all the scores were approximately on the straight line. In addition, the mean (20.89), 5% trimmed

mean (21.38), and median (21.0) were approximately the same (Appendix B). These results imply that the data was normality distributed. Figure 2 presents the distribution for respondents without professional qualification in education.

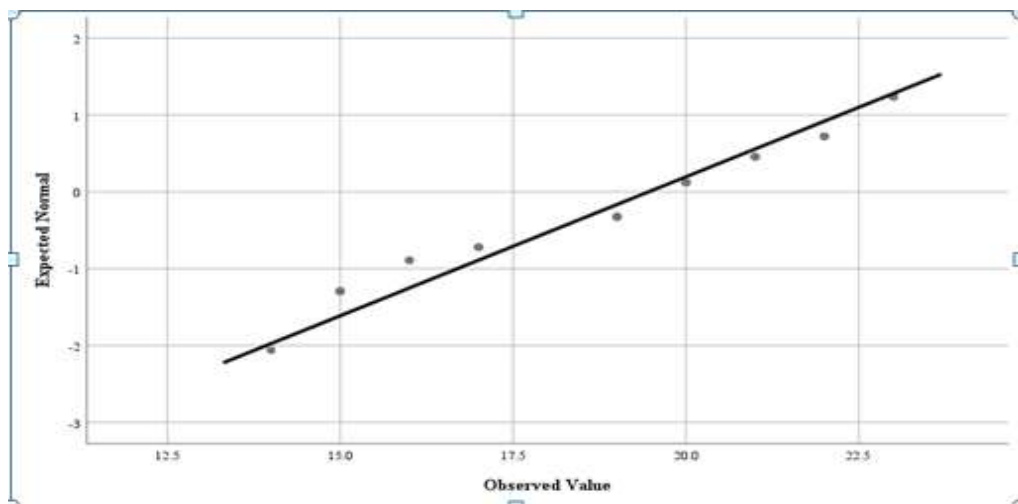


Figure 2- Normal Q-Q plot for professional qualification without education

As shown in Figure 2, the data for respondents without education background was normality distributed, since all the scores were almost on the line. This result was further confirmed by the mean (19.46), 5% trimmed mean (19.53), and median (20.0), which were approximately equal (Appendix B). Based on these results, it can be said that the distribution of scores was normal. Table 6 presents the test for the differences.

Table 6– *Independent Sample T-test Results for Difference in Health Tutors’ Classroom Assessment Literacy based on Professional Qualification*

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	p-value	MD
Equal variances assumed	.000	.995	3.11	169	.002*	1.43
Equal variances not assumed			3.09	90.52	.003	1.43

*Significant at $\alpha = 0.05$

MD=Mean Difference

From Table 6, the Levene’s test for equality of variance was not significant, $p = .995$. This means that the variances between the two independent groups (teacher with background in education and teacher without background in education) were equal with regards to teacher knowledge in classroom assessment literacy. The results further showed a statistically significant difference in the mean scores of respondents with professional background in education ($M = 20.89$, $SD = 2.73$), and those without education background ($M = 19.46$, $SD = 2.76$), $t(169) = 3.11$, $p = .002$. The magnitude of the difference was determined using eta squared (η^2).

$$\begin{aligned} \text{Eta squared } (\eta^2) &= \frac{t^2}{t^2 + (N_1 + N_2 - 2)} \\ &= \frac{3.11^2}{3.11^2 + (121 + 50 - 2)} \\ &= \frac{9.6721}{178.6721} \\ &= .05 \end{aligned}$$

The effect size, $\eta^2 = .05$ was medium. This implies that the magnitude of the difference was moderate, thus, 5% of the variance in knowledge in assessment literacy was explained by professional background of tutors. In effect, there is statistical significant difference in the assessment knowledge

level of tutors with professional qualification in education as compared with those without professional qualification in education. Accordingly, it can be said that tutors with education background are more knowledgeable in assessment than those without education background. Hence, the null hypothesis which stated that there is no significant difference in the knowledge level of health tutors on classroom assessment literacy with respect to professional qualification in education was rejected.

Hypothesis Two: There is no significant difference in the level of knowledge of health tutors on classroom assessment literacy of health tutors with respect to years of teaching.

The aim of this hypothesis was to determine differences in health tutors' knowledge in assessment based on their years of teaching. This hypothesis was tested using one-way between group analysis of variance (ANOVA). The dependent variable was tutors' score on the classroom assessment literacy scale. The independent variable was years of teaching, which had four levels: 1 – 3 years, 4 – 6 years, 7 – 9 years, and 10 years or more. Preliminary analysis was performed to check assumptions surrounding the use of one-way between groups ANOVA. Figures 3 to 6 present the normality test.

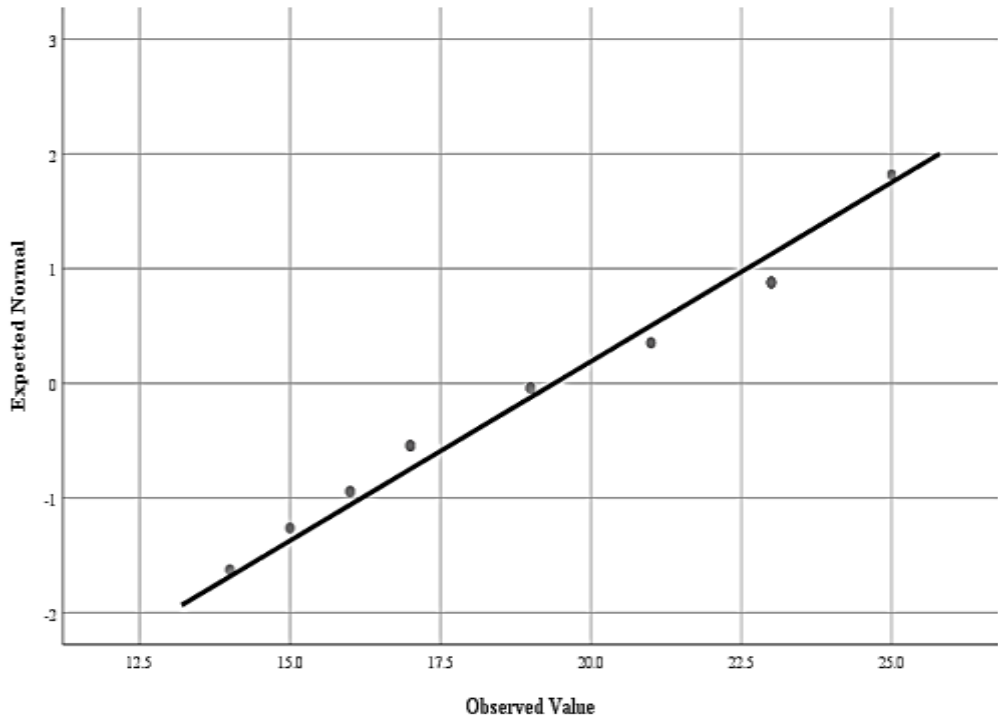


Figure 3- Normal Q-Q plot for 1 – 3 years

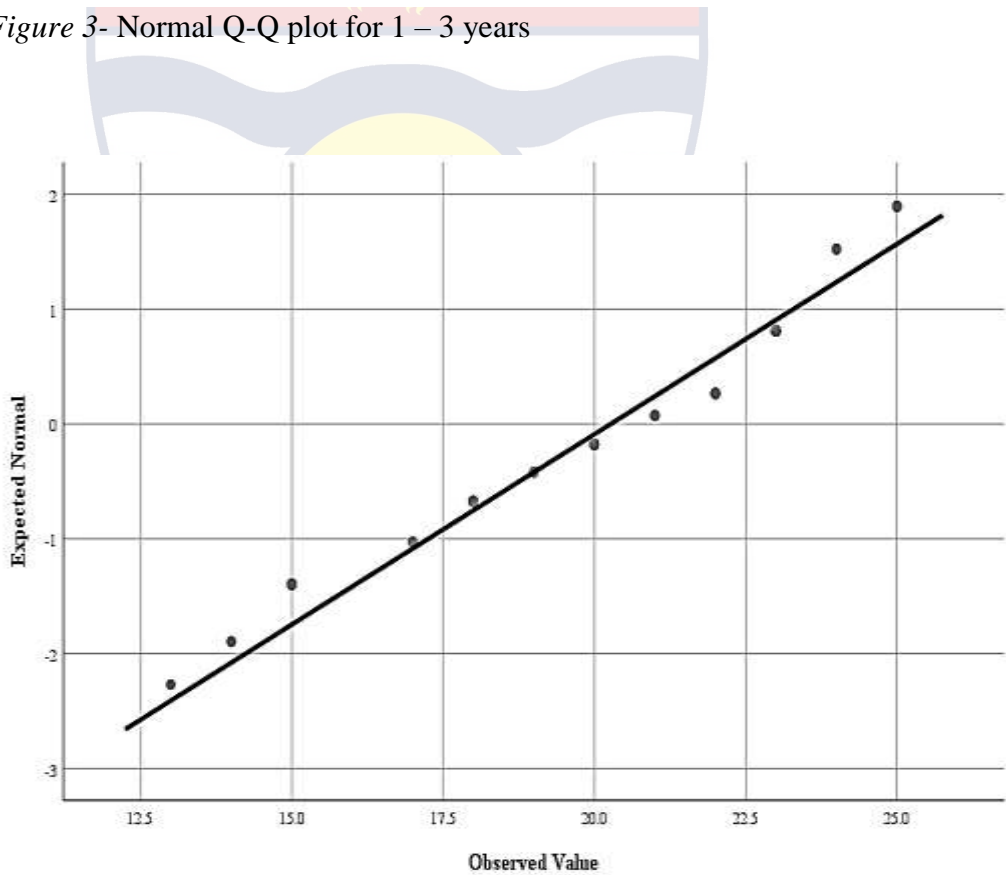


Figure 4- Normal Q-Q plot for 4 – 6 years

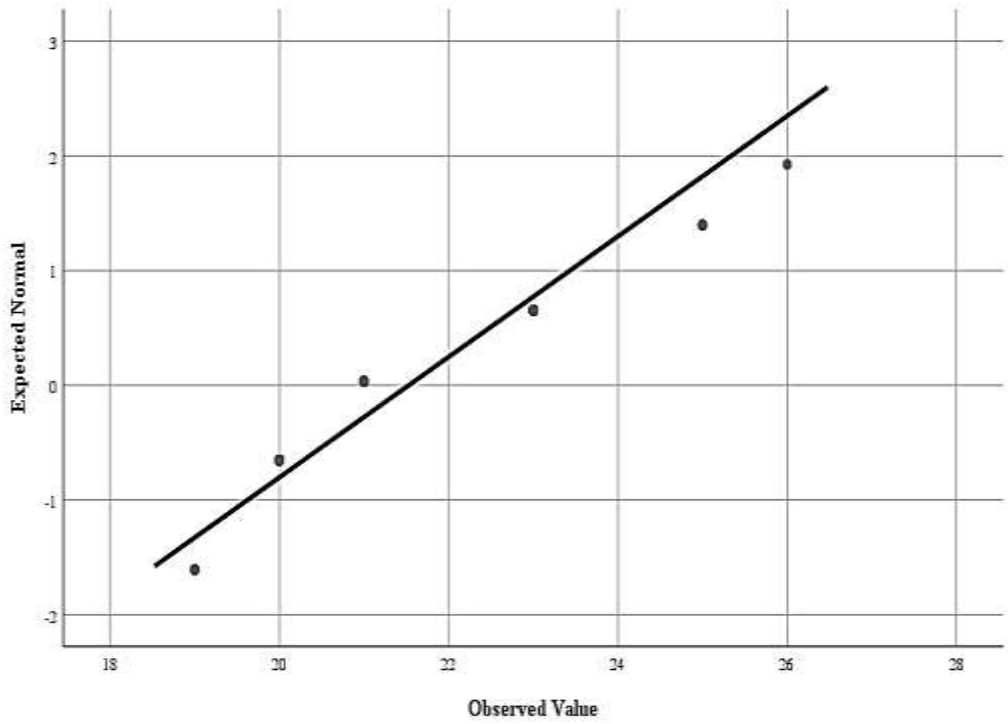


Figure 5- Normal Q-Q plot for 7 – 9 years

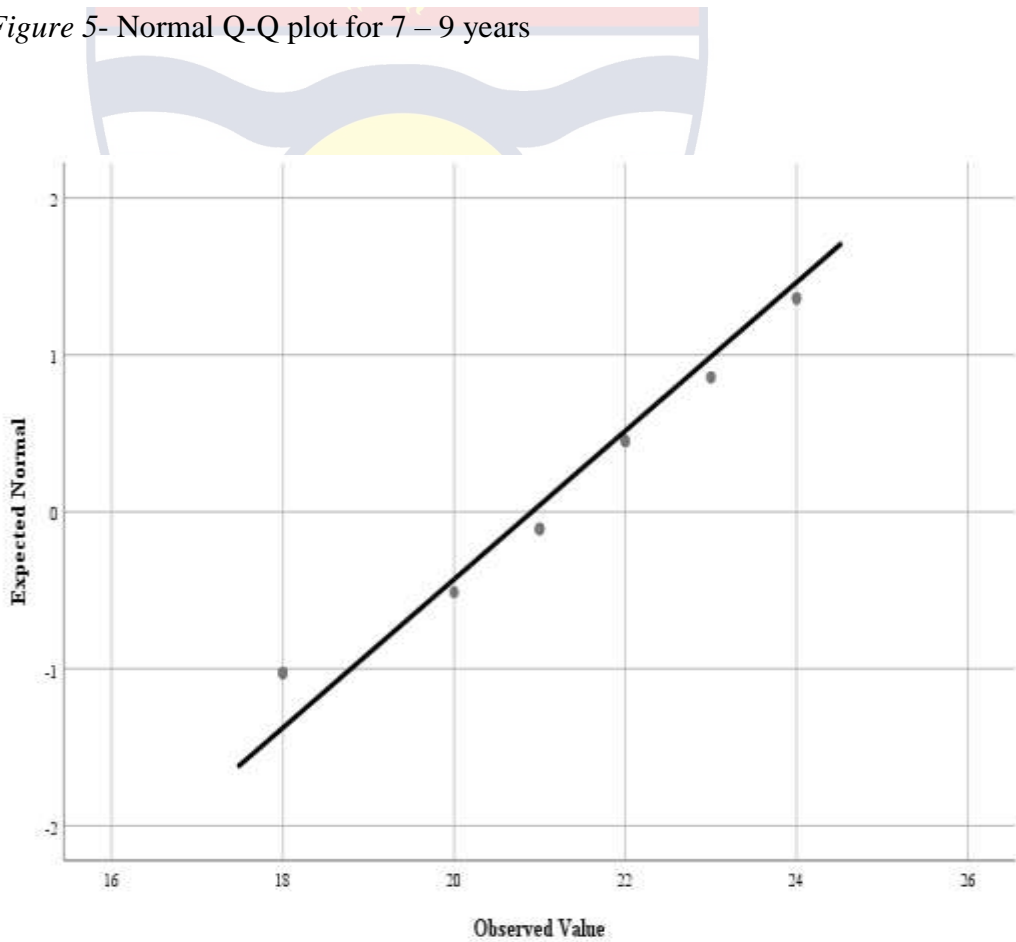


Figure 6- Normal Q-Q plot for 10 years & above

From Figures 3 to 6, the data for all the categories of years of teaching were normally distributed since all the scores were approximately on the straight line. Having satisfied the normality assumption, the homogeneity of variance assumption was also checked. The results of Levene’s test was statistically significant, $Levene(3, 167) = 5.14, p = .002$, which suggest a violation of the homogeneity assumption. Following the violation of the homogeneity of variance assumption, Welch test instead of one-way ANOVA was performed. Table 7 presents the results.

Table 7– *Welch Test on Years of Teaching of Respondents*

	Statistic ^a	df1	df2	Sig.
Welch	4.344	3	63.976	.008*

a. Asymptotically F distributed.

From Table 7, there is a statistically significant difference in the mean score of tutors with respect to their years of teaching, $Welch(3, 63.98) = 4.34, p = .008$. The result was followed up with Games-Howell multiple comparisons. The Games-Howell was used because the assumption of homogeneity of variance was violated. Table 8 presents the descriptive statistics for the groups.

Table 8– *Descriptive Statistics on Years of Teaching of Respondents*

Variable	N	M	SD	Std. Error
1 - 3yrs	28	19.39	3.20	.60
4 - 6yrs	85	20.27	3.02	.33
7 - 9yrs	36	21.53	1.90	.32
10yrs & above	22	20.91	2.11	.45

Source: Field survey (2019)

From Table 8, it can be concluded that respondents who have taught from 7 – 9 years ($M = 21.53, SD = 1.90$) are more knowledgeable in assessment than those who have taught for 1 – 3 years ($M = 19.39, SD = 3.20$).

In a similar vein, respondents who have taught from 7 – 9 years ($M = 21.53$, $SD = 1.90$) are more knowledgeable in assessment than those who have taught for 4 – 6 years ($M = 20.27$, $SD = 3.02$). Table 8 presents the multiple comparisons. Based on these results, the null hypothesis that “There is no significant difference in the level of knowledge of health tutors on classroom assessment literacy of health tutors with respect to years of teaching” is rejected in favour of its alternative hypothesis.

Table 9– *Multiple Comparisons on Years of Teaching of Respondents using Games-Howell*

(I) Years of teaching	(J) Years of teaching	Mean Difference (I-J)	Std. Error	Sig.
1 - 3yrs	4 - 6yrs	-.88	.69	.583
	7 - 9yrs	-2.13*	.68	.016
	10yrs & above	-1.52	.75	.199
4 - 6yrs	1 - 3yrs	.88	.69	.583
	7 - 9yrs	-1.26*	.46	.034
	10yrs & above	-.64*	.56	.663
7 - 9yrs	1 - 3yrs	2.13*	.68	.016
	4 - 6yrs	1.26*	.46	.034
	10yrs & above	.62	.55	.678
10yrs & above	1 - 3yrs	1.52	.75	.199
	4 - 6yrs	.64	.56	.663
	7 - 9yrs	-.62	.55	.678

*Significant, $p < 0.05$

From Table 9, there is a significant difference between the mean score of respondents who have taught from 1 – 3 years and those from 7 – 9 years, $p = .016$. Similarly, there is a significant difference between the mean score of respondents who have taught from 4 – 6 years and those from 7– 9 years, $p = .034$.

Discussion of Results

The first research question sought to find out the knowledge level of health tutors in classroom assessment literacy in Central Region, Ghana. The study found that majority, 115 of 171 respondents had high knowledge in

assessment. This finding was in line with a study by Alkharusi et al. (2012). Alkharusi et al. explored competence, knowledge, and practices of teachers about educational assessment among 165 in-service teachers randomly selected from Muscat educational governorate in the Sultanate of Oman. The study found that teachers perceived themselves as being competent in educational assessment. In a similar study, Sathasivam and Daniel (2011) examined the assessment literacy of selected Malaysian primary science teachers and found that teachers had high assessment knowledge. Teachers' assessment literacy stemmed more from the behaviourist perspective and that external examinations still dominated what drives teachers' ideas about their practices. It was also found that their level of knowledge in formative assessment practices was low. This could negatively affect teachers' adherence to assessment principles and how their knowledge on assessment would affect their students' understanding of scientific concepts.

The finding of the current study is in contrast with Amedahe (1989) whose study revealed that SHS teachers in the Central Region of Ghana have inadequate skills in testing. In a similar study among Junior High School teachers in Ghana, teachers were found to have limited competencies in the management in the assessment practices (Curriculum, Research & Development Division [CRDD] of Ghana Education Service, 1999). In addition, Kiomrs et al. (2011) in Iran found that teachers of secondary schools have a very poor knowledge base in language assessment. This difference in results could be attributed to length of time, nature of respondents and type of training. For example, the year in which the current study was conducted compared with Amedahe's (1989) and CRDD's (1999) study, things have

change, and this might affect the assessment knowledge of teachers. Also, looking at the nature of respondent involved in the study such as JHS teachers, SHS teachers and compared with health tutors in tertiary level, this could influence their assessment literacy.

The second research question sought to determine the extent to which health tutors followed principles in writing multiple-choice items in Central Region, Ghana. It was revealed that health tutors very often adhered to the recommended principles in constructing multiple-choice test items. In line with the finding of this study, Koloi-Keaikitse (2012) found that most of the teachers adhered to assessment principles in constructing multiple choice items and they had the skills in constructing objective items and applying assessment results.

In contrast with the finding of this study, Onyechere (2000) found that some teachers in the senior secondary schools craft poor multiple choice tests while others continue to use replica of test items because they seem to have inadequate knowledge and skills in test construction. Beside teachers assessment illiteracy in constructing multiple choice items, they are not proficient in implementing a variety of classroom assessment tasks (Mertler, 1999; Mertler & Campbell, 2005), hence lack of assessment literacy is potentially a serious risk both for teachers and students. Also, extant researchers indicated that teachers' adherence to assessment skills are generally weak due to low level of assessment literacy among teachers (Brookhart, 2001; Campbell, Murphy & Holt, 2002). This could affect students' comprehensive development (Stiggins, 2001).

The first hypothesis sought to determine difference in health tutors' knowledge in assessment with respect to their professional qualification in education in Central Region, Ghana. The results of this hypothesis showed a significant difference in tutors' knowledge in assessment, with a medium magnitude of effect. Tutors with professional qualification in education were more knowledgeable in assessment than those without background in education. The difference in result could be attributed to several factors like assessment and measurement courses that these tutors might have taken during their educational training. It could be said that tutors with professional qualification in education were taught "assessment and measurement" in schools and educational practices.

This finding agrees with several authors. For example, in a survey of 288 teacher candidates enrolled in a teacher education programme in Canada, DeLuca and Klinger (2010) found that teacher candidates who elected to enroll in an educational assessment course had higher levels of confidence in educational assessment knowledge and skills than those who did not have formal instruction in assessment. The study also noted benefits of pre-service measurement courses on teacher candidates' confidence levels. In their study, elementary teacher candidates showed the greatest gains in confidence as attributed to explicit assessment education. In Nigeria, Ololube (2008) also evaluated test construction skills of professional and non-professional teachers in Nigeria and reported that professional teachers tend to construct effective evaluative instruments more than the non-professional teachers. It was also found in Ololube's study that professional teachers have the propensity to

employ the various assessment techniques correctly, which is unlikely to happen in the case of non-professional teachers.

Motovu and Zubairi (2013) analysed the lecturers' competencies and practices in assessing students. The MANOVA multivariate test results highlighted differences in assessment competencies and practices among lecturers based on professional qualification (teaching qualification), type of university, and specialisations, and academic levels. The Tukey HSD post hoc test results revealed that lecturers in the specialisation of education were different from their counterparts in other specialisations, in interpreting assessment results. In a related study, Tagele and Bedilu (2015) assessed teachers' competence in the educational assessment of students in Amhara National Regional State. The t-test results showed that those who took a separate course in measurement and evaluation during their training scored statistically significantly higher than those who did not take a course where the mean for those who took a course being greater by 1.28 points.

However, this research result indicating a statistically significant difference in classroom assessment literacy between health tutors with and without professional qualification in education, contradicted the study of Wiredu (2013) in Ghana that there is no statistically significant difference in assessment practices (planning, construction, evaluation, administration, scoring and feedback) between tutors with professional certificate in education and those without professional certificate in education.

The second hypothesis sought to determine differences in health tutors' knowledge in assessment with respect to years of teaching in Central Region Ghana. The result of the study showed a statistically significant difference in

tutors' knowledge in assessment based on their years of teaching. Tutors who have taught from 7 – 9 years were more knowledgeable in assessment than those who had taught for 1 – 3 years. In a similar vein, respondents who had taught from 7 – 9 years were more knowledgeable in assessment than those who had taught for 4 – 6 years. The result implies that duration of teaching in the nursing school has enormous impact on tutors' level of knowledge in assessment. Health tutors with 7 – 9 years of teaching could have also been exposed to in-service training, workshops and other refresher courses in assessment during these years of teaching than their counterparts who have taught for less than 6 years.

This finding agrees with DeLuca and Bellara (2013), who found that beginning teachers continue to maintain low competency levels in assessment. They concluded by asserting that the variability in accreditation policies, standards of practice, and other influences on pre-service assessment education contribute to different foci and content for the preparation of teachers. In addition, Alkharusi et al. (2011) found that in-service teachers had a higher level of perceived skilfulness in educational measurement than pre-service teachers. In addition, the results not only testified to the value of pre-service measurement training, but also showed the merit of teaching practicum and teaching experience when preparing teachers in educational measurement. Similarly, Alkharusi (2011c) found that, teaching experience correlated positively with self-perceived assessment skills, and teachers with in-service assessment training showed a higher level of assessment skills than those without in-service assessment training.

Chapter Summary

The study was conducted to examine assessment literacy of health tutors in Central Region, Ghana. The study was guided by two research questions and two hypotheses. The findings of the study revealed that;

1. the majority of the tutors had high knowledge in assessment,
2. health tutors most often followed recommended principles in constructing multiple-choice test items,
3. there was a statistically significant difference in assessment knowledge of tutors based on professional qualification in education with a moderate magnitude of effect. Tutors with professional qualification in education were more knowledgeable in assessment than those without background in education and
4. there was a statistically significant difference in tutors' knowledge in assessment based on their years of teaching. Tutors who had taught from 7 – 9 years were more knowledgeable in assessment than those who had taught for 1 – 3 years and those who had taught for 4 – 6 years, however, those who had taught for 1 – 3 years and 4 – 6 years had equal assessment knowledge.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

The purpose of the study was to assess health tutors' level of literacy in assessment. This chapter presents the summary, conclusion and recommendations made.

Overview of the Study

The main thrust of the study was to examine the assessment literacy of nursing (health) tutors in Central Region, Ghana. Specifically, the study was guided by the following research questions and hypotheses:

Research Questions

1. What is the knowledge level of health tutors in classroom assessment in Central Region, Ghana?
2. How do health tutors follow recommended principles in writing multiple-choice items in Central Region, Ghana?

Research Hypotheses

1. H_0 : There is no statistically significant difference in the knowledge level of health tutors in classroom assessment with respect to professional qualification in education.

H_A : There is statistically significant difference in the knowledge level of health tutors in classroom assessment with respect to professional qualification in education.

2. H_0 : There is no statistically significant difference in the knowledge level of health tutors in classroom assessment literacy of health tutors with respect to years of teaching in Central Region, Ghana.

H_A : There is statistically significant difference in the knowledge level of health tutors in classroom assessment literacy of health tutors with respect to years of teaching in Central Region, Ghana.

The descriptive survey research design was employed to conduct the study. The population for the study consisted of all nursing (health) tutors in five (5) public nursing training colleges in Central Region of Ghana, numbering 183. Using the census method, all these tutors were engaged in the study. Questionnaire was designed to gather data from 183 tutors; however, 171 questionnaires were retrieved due to the unavailability of some tutors at the time of collection of the answered questionnaires. The data collected from the field were analysed using means and standard deviations, frequencies, percentages, independent samples t-test, and one-way between groups ANOVA.

Key Findings

1. The first research question sought to find out the knowledge level of health tutors in classroom assessment literacy in the nurses' training colleges in Central Region, Ghana. The study found that majority of the tutors had high knowledge in assessment.
2. The second research question sought to determine how health tutors in the nurses' training colleges in Central Region of Ghana follow the recommended principles in writing multiple-choice test items. It was

revealed that most health tutors very often followed recommended principles in constructing multiple-choice test items.

3. The first hypothesis sought to determine statistically significant difference in tutors' knowledge in classroom assessment with respect to their professional qualification in education. The result of this hypothesis showed a statistically significant difference in tutors' knowledge in assessment, with a medium magnitude of effect. Tutors with background in education were more knowledgeable in classroom assessment than those without background in education.
4. The second hypothesis sought to find statistically significant difference in tutors' knowledge in classroom assessment with respect to years of teaching. The result of the study showed a significant difference in tutors' knowledge in classroom assessment with regard to their years of teaching. Tutors who had taught from 7 – 9 years were more knowledgeable in classroom assessment than those who had taught for 1 – 3 years and those who had taught for 4 – 6 years. However, those who had taught for 1 – 3 years and 4 – 6 years had equal classroom assessment knowledge.

Conclusion

Following the findings of the study, it can be concluded that health tutors are knowledgeable in assessment, and this could possibly explain why these tutors, followed the recommended principles in developing multiple-choice test items. This, therefore, suggests that tutors were engaging in assessment practices which should help yield valid and reliable results. Tutors being more knowledgeable in assessment could also be as a result of their

professional background in education. It was revealed that a vast majority of the tutors had professional qualification in education, and might have taken at least a course in assessment in education. It can therefore be concluded that professional background in education could determine a tutor's knowledge in classroom assessment. Similarly, it can also be concluded that duration of teaching in the nursing school has enormous impact on tutors' level of knowledge in classroom assessment. Thus, the more experienced tutors are, the better their knowledge in classroom assessment.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. The Nursing and Midwifery Council and the Board of Health Training Institutions only or continue to recruit health tutors with certificate in professional education or supplementary knowledge in assessment to teach in the Nursing / Midwifery Training Colleges in Central Region, Ghana since majority of tutors were having professional qualification in education.
2. Health tutors in Central Region are encouraged to take advance courses in assessment especially on the test items construction (multiple-choice test items) in order to keep themselves abreast with updated issues as far as recommended principles of multiple-choice is concerned. This is because even though tutors followed recommended principles very often, it is ideal that they mostly (at all times) adhered to all the recommended principles in writing multiple-choice test items.

3. The Nursing and Midwifery Council and the Board of Health Training Institutions are entreated to, as part of their workshops and retraining for tutors, engage more with tutors without professional qualification in assessment, emphasising on assessment techniques, validity and reliability of assessments and marking guide to help tutors without certificate in education increase their assessment literacy in nurses' training in Central Region, Ghana.
4. Head of various health institutions in Central Region are encouraged to organise workshops/seminars on test construction at least twice every year especially for tutors without professional qualification in education and those tutors below six (6) years of teaching. This will encourage health tutors in Central Region to continually follow the recommended principles in constructing multiple-choice test items as well as increase their assessment literacy, since doing so will help them achieve valid and reliable feedback from their students.

Suggestions for Further Studies

1. It is suggested that future studies in this area, as part of the investigation should examine samples of tests developed by the tutors, while assessing their knowledge in assessment. Doing so will provide more detail and valid information on tutors' knowledge in assessment.
2. It is also suggested that this study be replicated in among health tutors in other regions in Ghana.
3. It is suggested that in the future, there should be a study on how health tutors motivation with regards to assessment affect students' achievement.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Questionnaire for Tutors

This questionnaire solicits information on tutors' assessment of students' learning. This is purely an academic exercise and for this any information you provide will be treated as confidential. Please be informed that participation in this study is not compulsory, and you may withdraw from the study at any point in time when deemed necessary. Please respond to the best of your knowledge.

Instruction: Please tick [] or write in the appropriate column to indicate your response.

Section A – Background Information

1. Gender

a. Male []

b. Female []

2. Age

a. 20 years & below []

b. 21 – 30 years []

c. 31 – 40 years []

d. 41 – 50 years []

e. 51 – 60 years []

3. Professional qualification

a. Degree with education []

b. Degree without education []

4. Years of teaching:

Section B – Assessment Literacy

Please indicate your response to each of the following statements to the best of your knowledge.

Statements	True	False
5. In choosing an assessment technique, it is best to consider the ease of preparing the assessment.		
6. Students test scores are said to be reliable when they accurately reflect the content of what was taught.		
7. A tutor must prepare a marking guide after constructing the test items.		
8. The most effective way to assess the logic students used to arrive at a conclusion is to provide them with a task that involves problem solving.		
9. A tutor must write test so that both high and low achievers can understand.		
10. The most effective way a tutor can assess students' ability to put parts/pieces, arrange and combine to make a pattern is to use multiple-choice type test.		
11. Adding more items to the test increases the reliability of the test results.		
12. To assess students' skills in organizing ideas rather than just repeating facts, it is best to craft items which demand students to 'define, recall, restate'.		

Statements	True	False
13. If a tutor wants to know whether students have mastered certain instructional objectives, it is best to assess students using test samples in textbooks		
14. Information on students' scores in quiz/class test can be used to modify instruction better than students' scores in end of semester examination.		
15. It is best to assess students when test items are selected from published textbooks or past questions.		
16. Test should be administered to students at any time even without their prior notice.		
17. When testing students, they should be allowed a lot of time.		
18. Assessment procedures should be free of gender, ethnic, social class, and religious bias and stereotypes.		
19. Tests should be administered in well-lighted and well-ventilated rooms.		
20. Tests should be scored strictly according to the marking scheme.		
21. Scoring of essay tests is more objective than multiple-choice items.		
22. In scoring students' tests, tutors should be very hard on students who miss classes and be generous to students who are regular in class.		
23. If the average score of students in a class is 65, Kweku who had a score of 80 could be referred to as perform excellently.		

Statements	True	False
24. Tutors should not provide feedback on student's assessment to other people without the consent of the student.		
25. Ama can be referred to as an 'average' student when she performs better than more than half of her colleagues in the class.		
26. If a tutor wants to know how much a student has mastered some contents, it is best to describe his/her performance in relation to his/her peers.		
27. When constructing a test, a tutor should craft test items to cover all the request levels of cognitive domain.		
28. When grading students, tutors should primarily focus on students' scores on various assessments.		
29. Tutors should use multiple assessments to assess amount of students' learning.		
30. Tutors should be responsible for keeping students' assessment results confidential and to protect students' right to privacy.		
31. Tutors should provide feedback on students' assessment to students.		
32. Tutors need not obtain permission before using copyright materials in assessment.		
33. Assessment procedures used in class should accommodate the needs of students with disabilities or special needs.		
34. Tutors should interpret students' performance on one assessment in the context of the learning objectives taught rather than as a weapon for punishing the students or controlling their behaviour.		

SECTION C – Principles in Constructing Multiple-choice Items

Please indicate the extent to which each of the following statements applies to you, using the following scale: **N – Never; NO – Not often; O – Often; VO – Very often; A – Always**

Items	N	NO	O	VO	A
1. Prepare a table of specification first as a guide before writing the test items.					
2. Write concise, easy to read and understand central issue of every item in the stem.					
3. Construct test items with credible distractors.					
4. Write test items with answer to an item not dependence on the knowledge of the answer to a previous item.					
5. Ensure that the stem and options of an item are both at the same page.					
6. Construct items with expected response at the beginning of the stem.					
7. Ensure options follow syntax and punctuation rules.					
8. Ensure each item is made of only one correct or best response without specific clues.					
9. Construct original items not items copied from textbooks or others' past test items.					
10. Write test items with 'all of the above' as an option.					

Items	N	NO	O	VO	A
11. Prepare test items with varied placement of correct options arranged alphabetically.					
12. Write options that are similar in content for given item.					
13. Write options for given item with the same grammatical structure.					
14. Write options without repetition of a particular word(s) for given item.					
15. Construct items with consistent number of four or five options.					
16. Write test items with items measuring opinions excluded.					
17. Prepare responses in agreement itemized vertically.					
18. Prepare items with the stem and options stated positively.					
19. Write sentence responses in about the same length.					
20. Construct each item with distinct options/alternatives.					

Thank You!!!

APPENDIX B

DESCRIPTIVES ON TUTORS' PROFESSIONAL QUALIFICATION

Professional qualification		Statistic	Std. Error	
Degree with education	Mean	20.8926	.24836	
	95% Confidence Interval for Mean	Lower Bound	20.4008	
		Upper Bound	21.3843	
	5% Trimmed Mean	21.0184		
	Median	21.0000		
	Variance	7.463		
	Std. Deviation	2.73192		
	Minimum	13.00		
	Maximum	26.00		
	Range	13.00		
	Interquartile Range	4.50		
	Skewness	-.603	.220	
	Kurtosis	-.058	.437	
	Degree without education	Mean	19.4600	.39093
95% Confidence Interval for Mean		Lower Bound	18.6744	
		Upper Bound	20.2456	
5% Trimmed Mean		19.5333		
Median		20.0000		
Variance		7.641		
Std. Deviation		2.76428		
Minimum		14.00		
Maximum		23.00		
Range		9.00		
Interquartile Range		5.00		
Skewness		-.399	.337	
Kurtosis		-.907	.662	

APPENDIX C

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Telephone: 233-3321-32440/4 & 32480/3
Direct: 033 20 91697
Fax: 03321-30184
Telex: 2552, UCC, GH.
Telegram & Cable: University, Cape Coast
Email: edufound@ucc.edu.gh



UNIVERSITY POST OFFICE
CAPE COAST, GHANA

9th April, 2019

Our Ref:

Your Ref:

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

THESIS WORK
LETTER OF INTRODUCTION
MS. JOYCELYN YAYRA AKOETEEY

We introduce to you Ms. Akoetee, a student from the University of Cape Coast, Department of Education and Psychology. She is pursuing Master of Philosophy degree in Measurement and Evaluation and currently at the thesis stage.

Ms. Akoetee is researching on the topic:

"Assessment Literacy of Tutors in the Nurses' Training Colleges in Cape Coast"

She has opted to collect data at your institution/establishment for the Thesis work. We would be most grateful if you could provide her the opportunity for the study. Any information provided would be treated as strictly confidential.

Thank you.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Theophilus Amuzu Fiadzomor'.


Theophilus Amuzu Fiadzomor (Mr.)
Senior Administrative Assistant
For: HEAD

APPENDIX D

ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
ETHICAL REVIEW BOARD

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: CES-ERB/ucc.edu/19-28  Date: March 4, 2019

Your Ref:

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY


The bearer, Joycelyn Yawra Akpek Reg. No. EF/MEP/17/CCOT is an M.Phil. /Ph.D. student in the Department of Education and Psychology..... in the College of Education Studies, University of Cape Coast, Cape Coast, Ghana. ~~He~~ She wishes to undertake a research study on the topic:

Assessment literacy of tutors in Nurses' Training Colleges in the Central Region of Ghana.....

The Ethical Review Board (ERB) of the College of Education Studies (CES) has assessed ~~his~~her proposal and confirm that the proposal satisfies the College's ethical requirements for the conduct of the study.

In view of the above, the researcher has been cleared and given approval to commence ~~his~~her study. The ERB would be grateful if you would give ~~his~~her the necessary assistance to facilitate the conduct of the said research.

Thank you.
Yours faithfully,


Prof. Linda Dzama Forde
(Secretary, CES-ERB)

Chairman, CES-ERB
Prof. J. A. Omatoshu
omatoshu@ucc.edu.gh
0243764739

Vice-Chairman, CES-ERB
Prof. K. Edjah
kedjah@ucc.edu.gh
0244742357

Secretary, CES-ERB
Prof. Linda Dzama Forde
lford@ucc.edu.gh
0244786680

APPENDIX E

CONSENT FORM

Dear sir/madam,

I am to conduct a study the purpose of investigating the assessment literacy of tutors in the nurses' training colleges in central region, Ghana. I, therefore, write to seek your consent to voluntarily provide me with the needed information in this study. There is no penalty for not participating. However, there is no conceivable risk associated with this study.

I must state that you have the right to withdraw from the study at any time without consequence. In addition, any information provided will be kept anonymous and treated strictly confidential.

To obtain the needed information to achieve the purpose of the study, you will be required to respond to a questionnaire.

Please complete the information below to document your agreement to participate

I _____(please your name) have been informed about the purpose of the study and the ethical issues involved. I understand that the information given will be used for the intended academic purpose. I also understand that I can withdraw from the study at any point in time that I wish to.

I do give my consent to participate in the study as have received a copy of this consent form.

Your signature.....Date.....

I have received this consent form from the research participate and I will ensure anonymity and confidentiality of information provided.

Candidate's signature.....Date.....