UNIVERSITY OF CAPE COAST

ASSESSMENT LITERACY AND PRACTICES ON STUDENTS' ACADEMIC ACHIEVEMENTS

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2023

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BY

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A 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 a Master of Philosophy degree in Measurement and Evaluation

JULY 2023

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:..... Date:.....

Name: ……..

Supervisors' Declaration

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature:..... Date:.....

Name: ……..

ABSTRACT

This research delved into Teachers 'assessment literacy (TAL), and classroom assessment practices (CAP) on the academic achievement of students in the Sagnarigu Municipality, Ghana. Employing a descriptive cross-sectional survey design, the study focused on 150 English, Mathematics, and Science (EMS) professional Junior High School (JHS) teachers and 2097 Basic Education Certificate Examination (BECE) candidates from 50 GALOP junior high schools in the Municipality, utilizing a purposive sampling technique. Data were gathered through a questionnaire on CAP, a district mock examination, and a TAL questionnaire. The analysis involved frequencies, percentages, means, and Pearson correlation techniques. The findings revealed that most professional teachers possessed a substantial understanding of student assessment. teachers demonstrated alignment of test items with instructional goals and consideration of the exam's purpose, the non-utilization of test specification tables was noted. The majority of students' academic achievements in EMS were below average. A noteworthy positive correlation surfaced between TAL and their CAP. The relationship between TAL and students' academic achievement exhibited varying degrees, with mathematics showing a weak correlation, English language a moderate one, and science demonstrating a strong positive relation. Similarly, the association between CAP and students' achievements displayed a spectrum from weak to strong relationships. The study concludes by recommending the instruction of teachers on the importance of incorporating test specification tables in question formulation, with an additional suggestion for school officials to support teachers in adopting this practice.

KEYWORDS

Assessment literacy

Classroom assessment practices

Academic achievements

Professional teachers

ACKNOWLEDGEMENTS

I wish to extend my profound appreciation to my esteemed supervisor, Dr. Kenneth Asamoah Gyimah, for his unwavering patience and invaluable guidance throughout the course of this research.

Additionally, I am deeply indebted to Regina Mawusi Nugba (Ph.D.) for her exceptional efforts in ensuring the success of this endeavour. Her contributions and constructive feedback have played a pivotal role in shaping the outcomes of this study, and for that, I am truly grateful.

Furthermore, I would like to express my heartfelt gratitude to Mr. Abdul Rahaman, Mr. Takyei Wadier, and Mr. John Baffour for their invaluable and insightful suggestions. Their expertise and contributions have greatly enriched the quality of this research, and I am sincerely appreciative of their assistance.

DEDICATION

To my parents, siblings and friends.

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CHAPTER ONE

INTRODUCTION

The centrality of assessment in achieving educational objectives is widely acknowledged, particularly when implemented with rigour and expertise. Classroom assessment literacy encompasses the essential knowledge and skillset for gathering comprehensive data on students' academic progress. This empowers educators to adeptly apply diverse assessment methodologies, consequently enhancing instructional quality and the learning experience for students (Khan, 2012). Within the context of Ghanaian basic schools, student assessment adopts a multifaceted approach, integrating both traditional and alternative assessment methods (Awuah, 2022). This holistic approach facilitates the understanding of individual student strengths and areas for improvement, informing targeted instructional adaptations that foster heightened student engagement, motivation, and overall academic achievement.

However, a concerning decline in student academic achievement across various Ghanaian municipalities, including Sagnarigu, has become a pressing concern for educational stakeholders. This downturn has been attributed to a multitude of factors, with teachers' proficiency in assessment emerging as a significant contributor. The relationship between teachers' assessment literacy, their classroom assessment practices, and student's academic achievement has attracted increasing attention in educational research. Scholars recognize that the level of teachers' assessment literacy directly influences the quality and objectivity of classroom assessments, consequently impacting student outcomes (Hussain, 2017; Hudson, 2017;

Rodriguez, 2004). Therefore, a comprehensive investigation into the interplay between these variables is critical for fostering an optimal learning environment that maximizes students' potential. Consequently, conducting this study within public basic schools in Sagnarigu Municipality is of paramount importance.

Background to the Study

Assessment is an intricate and continuous process wherein teachers evaluate students' performances for diverse objectives throughout the academic year (Nayimova,2020). Proficiency in assessment techniques is essential for sound assessment practices, as teachers' knowledge, skills, and attitudes significantly influence classroom assessment practices (Bayat & Rezaei, 2015). Both teachers and students actively participate in the assessment process, with teachers strategically planning and selecting assessment tools and determining scoring criteria. Students, in turn, are required to adequately prepare for assessments (Fontanillas, Carbonell & Catasús, 2016). The effectiveness of teachers' assessment practices is contingent upon their assessment literacy, as it enables them to proficiently evaluate students' performances. This literacy forms the foundation for diverse assessment methods employed by teachers in the classroom (Alkharusi, Kazem & Al-Musawi, 2011)

The discourse surrounding educator assessment literacy has gained significant traction in recent years (Volante & Fazio, 2007; Popham, 2009a; Deluca & Klinger, 2010). Defined as the multifaceted ability to effectively assess student knowledge and skill acquisition, interpret resultant data, and utilize these insights to optimize both pedagogical strategies and program

effectiveness (Webb, 2002), assessment literacy extends beyond mere technical proficiency. It encompasses a nuanced understanding of theoretical and philosophical underpinnings related to student learning measurement, coupled with the ability to translate this knowledge into effective assessment practices (Volante & Fazio, 2007). Consequently, enhancing assessment literacy among educators necessitates targeted interventions that address both the cognitive (knowledge-based) and affective (dispositional) dimensions of this complex construct.

At its core, assessment literacy resides in the possession and competent execution of assessment-related knowledge, skills, and dispositions required for a given individual's professional responsibilities within the educational sphere (Popham, 2009b). This encompasses a multifaceted awareness of diverse assessment types, including formative and summative evaluations, classroom-based and large-scale assessments, and fundamental psychometric principles (Deluca & Klinger, 2010). Expanding upon this multifaceted conception, Cha Chappuis, Stiggins, Chappuis, and Arter (2012) define assessment literacy as the requisite epistemological and operational skillset needed to: systematically gather data pertaining to student achievement, and effectively leverage the assessment process and its outcomes to optimize the quality of instruction for both teachers and students.

Assessment literacy constitutes the cognitive capabilities and competencies required by educators, enabling them to (1) discern, choose, or formulate assessments meticulously tailored for diverse objectives and (2) scrutinize, assess, and employ both quantitative and qualitative evidence derived from assessments to make judicious decisions for the enhancement of

student learning (Gareis & Grant, 2015). Educators possessing a comprehensive understanding of assessment can seamlessly incorporate testing methodologies into the learning process and adeptly utilize instructional formats that align with students' needs (McMillan and Nash, 2000; Volante & Fazio, 2007).

Within the classroom, a diverse tapestry of assessment practices beyond simple examinations is woven by educators to evaluate student learning and progress towards targeted instructional objectives (Hott, Dibbs, Hayes & Raymond, 2020). These practices, encompassing formative assessments, feedback mechanisms, and innovative approaches, transcend mere evaluation, playing a pivotal role in informing instructional decisions, adapting teaching methods, and tailoring support to individual student needs (Brookhart, 2011). The manner in which assessment is used within the classroom significantly shapes the overall educational landscape. In Ghana, classroom assessment also plays a critical role in our education system. According to Asamoah-Gyimah (2002), classroom assessment practices are frequently used as a major evaluating device of students' progress in Ghana schools. Assessment practices are, therefore, indispensable tools in the educational enterprise.

Despite the great deal of emphasis being placed on classroom assessment over the years by educators, evidence suggests deficiencies in classroom assessment knowledge, competencies, skills, practices among teachers (Adedoyin, 2012; Agai, 2015). Studies revealed that ESL teachers lack solid knowledge in assessment literacy (Quyen & Khairani, 2017). Lian and Yew (2016) stated that teachers lacked assessment literacy knowledge and

this created problems in using timely and accurate assessment practices. Teachers' low-level understanding of assessment literacy obstructed students from attaining their full potential. Literature showed that teachers do not adhere to the main principles of educational assessment as recommended by scholars when assessing student learning (Koh, Burke, Luke, Gong, & Tan, 2018; Ashraf & Zolfaghari, 2018, Pastor & Andrade, 2019)

This concern with classroom teachers' assessment knowledge and practices is not different in the Ghanaian educational context, concerns about assessment literacy extend to the classroom, with studies revealing a deficit in teachers' assessment knowledge and skills, leading to non-compliance with prescribed assessment standards (Amedahe, 1993; Anhwere, 2009; Wiredu, 2013; Sasu, 2017). Research suggests that teachers possessing advanced assessment literacy competencies are better equipped to design and implement effective assessments that align with instructional objectives (Popham, 2010). The quality of classroom assessment practices, in turn, influences students' engagement, motivation, and overall academic achievement (Black & Wiliam, 2018).

Students' academic achievement, a central focus of educational endeavors, represents the culmination of the teaching and learning process. It encompasses the knowledge, skills, and competencies acquired by students through their educational journey (Tian & Sun, 2018). Academic achievement is often measured through standardized assessments, including examinations like the Basic Education Certificate Examination (BECE) in Ghana.

The BECE is a national examination administered by the West African Examinations Council (WAEC). Its primary purpose is to assess the academic

achievement of students completing their junior high school education. Generally, educational outcomes in Ghana, more especially, at the junior high level, has witnessed a downward trend in terms of academic achievement and proficiencies (Attram, 2014). According to available records, the last decade alone saw over 3,669,138 Basic Education Certificate Examination (BECE) candidates sitting for that examination, with about 1,562,270 (43%) of them failing to obtain the required grades, those who had aggregates 30 and above are considered as failed candidates for progression to any secondary, technical or vocational (Attram, 2014).

The Sagnarigu Municipality in Ghana's Northern Region serves as a prime example. Persistent below-average scores on the Basic Education Certificate Examinations (BECE) raise concerns about student academic achievement in the Sagnarigu Municipality. Analyses by the Centre for Active Learning and Integrated Development (CALID) from 2013-2017 and the Ghana Education Service (GES) from 2018-2020 reveal troubling trends, with BECE scores consistently falling between 49.47% and 34.58% (CALID, 2018; GES, 2020).

Factors influencing Basic Education Certificate Examination (BECE) performance are multifaceted, with teacher assessment literacy and effective classroom assessment practices emerging as pivotal determinants of student academic achievement. Extensive research (Bennett, 2011; Davidheiser, 2013; Stiggins & Chappuis, 2008) underscores the substantial positive correlation between teachers' assessment literacy, classroom assessment practices and students' academic achievement. Notably, these studies were conducted in developed countries, differing from the academic settings in Ghana.

Consequently, the current study explores the assessment literacy level and classroom assessment practices of teachers, examining their relationship with students' academic achievement in the Ghanaian context.

Statement of the Problem

Assessment literacy is a critical attribute that every teacher should possess to effectively gauge students' performances and optimize learning and instructional outcomes (Lian, Yew & Meng, 2014). By engaging in effective classroom assessment, teachers can discern successful instructional techniques and customize lessons to cater to the specific needs of individual students, thereby bolstering the quality of curriculum and teaching methodologies (Khan, 2012).

In Ghana's education system, the Basic Education Certificate Examinations (BECE) stand as a crucial gateway for students transitioning from junior high to senior high or technical institutions (Nugba, Quansah, Ankomah, Tsey & Ankoma-Sey, 2021). Passing the BECE is not only legally required but also academically essential. However, a worrying decline in BECE performance, seen across various districts and particularly concerning in Sagnarigu Municipality, demands attention.

The Sagnarigu Municipality, situated in the Northern Region of Ghana, has consistently exhibited below-average performance in the annual Basic Education Certificate Examination (BECE). The disconcerting trend is reflected in the BECE scores from 2013 to 2020, depicting percentages of 49.47%, 45.25%, 41.07%, 42.45%, 45.20%, 34.58%, 38.20%, and 36.65%, respectively (GES, 2020; Saviour, Izudeen, Abu, Ankalibazuk & Konzabre, 2022). This recurrent pattern necessitates a meticulous investigation to discern

the underlying factors contributing to the subpar BECE academic achievement of students in the Municipality.

Potential determinants of students' underperformance on the BECE could be associated with challenges in the classroom environment, teachers' competencies, curriculum-related aspects, student-related factors, or the influence of the home environment (Cavilla, 2017). In light of teachers' pivotal role in delivering high-quality education, their level of assessment knowledge and expertise significantly influences students' academic achievements, surpassing other factors such as class size or students' socio-economic backgrounds (Toh, Ho, Riley & Hoh, 2007).

Studies conducted by (Webb,2002; O'Connor, 2017), affirm the critical importance of classroom assessment within the spectrum of curricular and teacher-related factors, exerting a significant influence on student's academic achievement. Nevertheless, it is imperative to recognize that the constrained assessment literacy and proficiency demonstrated by teachers can detrimentally impact both their classroom assessment practices and the educational outcomes of junior high school students (Popham, 2011b).

While prior empirical research on assessment practices among Ghanaian teachers has yielded insights, the majority of these studies primarily focused on senior high school (SHS) teachers and tutors from colleges of education, illuminating prevalent deficiencies in assessment and testing practices (Akayuure, 2021; Kissi, Baidoo, Anane, & Annan, 2023; Jaward, 2019; Amoateng, 2017; Akyeampong, 1997). However, there is a noticeable gap in knowledge on the involved relationship between teachers' assessment

literacy, classroom assessment practices, and students' academic achievement within the broader Ghanaian educational context.

Moreover, existing research in the assessment domain within Ghana has predominantly concentrated on the southern region, overlooking the nuances and dynamics in the northern regions. While Saviour et al (2022), identify various contributors to poor BECE academic achievement in Sagnarigu Municipality, such as school environment deficiencies and family circumstances, Unfortunately, their analysis overlooks the crucial role teachers' assessment skills and practices play in determining student outcomes. This gap warrants further investigation to gain a more comprehensive understanding of the factors affecting academic achievement.

Delving into the assessment literacy of teachers, the types of assessments used in classrooms, and how these relate to student achievement in Sagnarigu Municipality's public basic schools could hold significant value. Examining these interconnected variables within this specific setting offers promising avenues for uncovering the drivers of academic success. This knowledge can then inform the design of targeted interventions to improve assessment practices and, ultimately, empower students to reach their full potential.

Objectives of the Study

The major objective of this study was to examine the relationship between public junior high school professional teachers' assessment literacy, classroom assessment practice, and their students' academic achievement in the Sagnarigu Municipality of Ghana's Northern Region. Specifically, the research objective is aimed to assess:

1. The current assessment literacy level of public junior high schools' EMS professional teachers in the Sagnarigu Municipality.
2. The classroom assessment practices of public junior high school EMS professional teachers in the Sagnarigu Municipality.
3. The level of academic achievement level of BECE candidates in the district mock examination in the Sagnarigu Municipality.
4. The relationship between junior high school EMS professional teachers' assessment literacy and classroom assessment practices.
5. The relationship between junior high schools' EMS professional teachers' assessment literacy and students' academic achievement.
6. The relationship between junior high schools' EMS professional teachers' classroom assessment practices and students' academic achievement.

Research Questions

The following research questions guide the investigation:

1. What is the assessment literacy level of public junior high schools' EMS professional teachers in the Sagnarigu Municipality?
2. What are the classroom assessment practices of public junior high schools' EMS professional teachers in the Sagnarigu Municipality?
3. What is the level of BECE candidates' academic achievement in the district mock examination in the Sagnarigu Municipality?

Research Hypotheses

This research seeks to test the following hypotheses:

This research seeks to test the following null hypotheses:

1. H_0: There is no significant relationship between EMS teachers' assessment literacy and classroom assessment practices.
2. H_0: There is no significant relationship between English Language teachers' assessment literacy and student academic achievement in English Language.
3. H_0: There is no significant relationship between Mathematics teachers' assessment literacy and students' academic achievement in Mathematics.
4. H_0: There is no significant relationship between science teachers' assessment literacy and students' academic achievement in science.
5. H_0: There is no significant relation between English language teachers' assessment practices and students' academic achievement in English Language.
6. H_0: There is no significant relationship between Mathematics teachers' assessment practices and students' academic achievement in Mathematics.
7. H_0: There is no significant relationship between science teachers' assessment practices and students' academic achievement in science.

Significance of the Study

The outcomes of this research hold significant potential benefits for key educational institutions, including the Ministry of Education (MoE), and Ghana Education Service (GES), as well as head teachers and teachers within various junior high schools situated in the Sagnarigu Municipality. The study's revelations are poised to furnish substantial evidence that elucidates the comprehension of junior high school teachers regarding assessment, the

impact of their assessment-related understanding on their actual classroom assessment methodologies, and the repercussions of this knowledge on the academic achievement of students.

The insights derived from this study can serve as valuable resources for education stakeholders, empowering them to enhance assessment standards and principles. This improvement can be achieved through the implementation of workshops and initiatives aimed at building the capacity of teachers in assessment. The ultimate goal is to address the persistent issue of diminishing academic achievements among students in the Basic Education Certificate Examination (BECE). By ensuring that educators are well-versed in assessment practices and employ effective methods in the classroom, there is a strategic opportunity to ameliorate the current predicament.

Consequently, this research contributes to the existing body of knowledge on assessment, not only in the Ghanaian context but also in a broader international context. The findings underscore the importance of fostering assessment literacy among educators and promoting the adoption of efficient assessment practices as a means of improving overall academic outcomes.

Delimitation

This research exclusively targeted professional teachers within public junior high schools situated in the Sagnarigu Municipality. Specifically, the study homed in on educators instructing mathematics, integrated science, and English language courses, restricting its scope to solely encompass public junior high schools under the Ghana Accountability for Learning Outcomes Project (GALOP) within the aforementioned municipality. While

acknowledging the existence of potential factors impacting students' academic achievements, this investigation deliberately centered on the variables of teachers' assessment literacy and classroom assessment practices.

Limitation

In this study, Pearson correlation techniques was employed to investigate the relationships between teachers' assessment literacy, classroom assessment practices, and students' academic achievement. It is essential to note that the outcomes and research findings, being correlational offer insights into associations but do not imply causation.

The total population for the study comprised 1,257 teachers and 5,754 students. However, utilizing a purposive sampling technique, the study focused on a subset, including 150 teachers (n = 150) out of the 1,257 teachers and 2,079 students (n = 2,079) out of the total student population of 5,754.

As a result of the limited sample size, the conclusions drawn from the study do not provide a comprehensive overview of the of teacher's assessment literacy competence, classroom assessment practices and students' academic achievement level within the entire population of teachers and students under consideration. It is imperative to recognize the constraints posed by the relatively small sample of teachers and students in extrapolating the findings to the broader population.

Definition of Terms

Assessment: Assessment is the collecting and analysis of information on student learning in accordance with set goals.

Assessment literacy: Assessment literacy is the capacity to consistently use the right techniques to evaluate students' learning, to communicate the findings to stakeholders, and to take into account moral and legal issues

Classroom assessment practices: Classroom assessment practises are an effort to evaluate both the instructional activities of teachers and the students' learning progress on a certain subject at the classroom level.

Students' academic achievement: student performance on a standardised test (2020 district mock assessment)

Professional teachers: One who makes teaching their job is referred to as a professional teacher. They possess a certification in education and have received specialised training in teaching techniques.

GALOP: Ghana Accountability for Learning Outcomes Project

Organisation of the Study

The study is structured across five chapters, each serving a distinct purpose. Chapter One initiates the exploration, encompassing the background, problem statement, study purpose, research objectives, questions, hypotheses, significance, delimitations, limitations, definition of terms, and an organizational overview.

Chapter Two delves into the conceptual theoretical and empirical foundations that informed the investigation into teachers' assessment literacy, classroom assessment practices, and students' academic achievement. Information crucial to the study's genesis was extracted from abstracts, books, journals, the internet, and relevant prior research.

Chapter Three articulates the study's methodology, presenting its key components in seven sections: research design, study area, population,

sampling procedure, research instrument, ethical considerations, data collection procedure, and data processing and analysis methods.

Chapter Four unveils the results and findings derived from the study. This section meticulously addresses the research outcomes concerning teachers' assessment competencies, classroom assessment practices, and students' academic achievements.

The final chapter, Chapter Five, serves as the culmination of the study, encapsulating a summary, conclusions drawn from the findings, and recommendations. Additionally, it provides insights into potential avenues for future research endeavors.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The study's major goal is to look into the relationship between public junior high school EMS professional teachers' assessment literacy, classroom assessment practices, and their students' academic achievement in the Sagnarigu Municipality in Ghana's Northern Region. This chapter discusses previous research relating to the study's objectives. The theoretical framework, as well as the conceptual and empirical reviews in the second and third sections, will be investigated.

Theoretical Review

Agentic action, as proposed by Bandura (2001) underscores the proactive role played by individuals as agents in shaping both their behavior and the environment. Within the educational context, teachers endowed with high levels of assessment literacy exhibit the requisite knowledge, skills, and agency to effectively design, implement, and interpret assessments (Popham, 2010). This proficiency translates into informed classroom practices characterized by a diverse array of assessment methods, alignment with learning objectives, and the provision of meaningful feedback (Black & William, 2018).

Notably, the cultivation of assessment literacy empowers teachers to transcend the traditional "passive recipient" role, assuming instead the proactive position of architects of learning. This proactive stance significantly increases the likelihood that teachers will employ discerning classroom assessment practices, thereby contributing to the enhancement of students'

academic achievement (Popham, 2004). Teachers with high assessment literacy dynamically leverage assessment data to diagnose learning gaps, differentiate instruction, and adapt their teaching strategies. This adaptive approach fosters a positive and responsive learning environment, ultimately enhancing student engagement and motivation (Wiliam, 2017).

The theoretical framework of planned behavior, as proposed by Ajzen (1991), elucidates the determinants of behavior by examining the interplay among attitudes, subjective norms, and perceived behavioral control. In the realm of education, teachers' attitudes toward assessment practices, shaped by their proficiency in assessment literacy, give rise to intentions to implement effective assessments in the classroom (Guskey, 2020). These intentions, when translated into enhanced classroom assessment practices, play a pivotal role in cultivating positive academic outcomes for students.

Simultaneously, subjective norms, encompassing perceived social influences and approval from professional peers and administrators, hold significance in shaping the prevailing assessment culture within educational institutions. As teachers align their assessment practices with these social norms, the resulting conducive assessment environment is poised to positively impact students' academic achievement. Furthermore, perceived behavioral control, indicative of teachers' confidence in executing effective assessment strategies, is intricately connected to their assessment literacy, thereby influencing the quality of assessments and subsequently impacting students' academic success (Ajzen, 1991).

The theory of reasoned action, posited by Fishbein and Ajzen in 2011, serves as a precursor to the theory of planned behavior, offering insights into

the intricate relationships among attitudes, intentions, and behaviors. In the context of education, teachers exhibiting favorable attitudes toward assessment practices, influenced by their elevated levels of assessment literacy, are predisposed to form intentions aimed at implementing discerning assessments within their instructional environments (Black & William, 2018). Consequently, the intention to employ effective assessment practices emerges as a robust predictor of realized behavior, underscoring that teachers with intentions to integrate sound assessment methodologies are more likely to actualize these intentions, thereby positively impacting students' academic achievements (Guskey, 2020).

High assessment literacy fuels agentic action, paving the way for informed, intentional and responsive classroom assessment practices. These practices, in turn, create a fertile ground for enhanced student academic achievement. Timely feedback, differentiated instruction, and a focus on learning progress empower students to become active participants in their own learning journey (Black and William, 2018).

Beyond the individual teacher, cultivating a school culture that supports agentic action is crucial. Leadership support, professional development opportunities, and collaborative assessment practices all play vital roles in fostering assessment literacy, empowering teachers, and ultimately, orchestrating the harmonious symphony of improved student academic achievement (Darling-Hammond & Bransford, 2005). By understanding the intricate connections between these key factors, teachers can create a learning environment where every step, like a note in the

symphony, leads to harmonious growth and success for both teachers and students.

Conceptual Review

This section discusses assessment-related ideas, including assessment types, purposes, classroom assessment practice, assessment literacy, the importance of assessment literacy, and students' academic achievement among others.

Concept of Assessment and Its Principles

Assessment is an integral and indispensable component of the learning and instructional process, as emphasized by Gronlund (2006). Its primary purpose is to systematically gather data on students' performance, enabling instructors to make informed judgments about their learning progress. Yetkin (2017), further defines assessment as a methodical approach to collecting data that allows educators to monitor and evaluate students' academic achievements.

Assessment is a comprehensive process of making determinations about students' levels of success or performance (Ramadurg, 2017). Implicitly, it provides valuable insights into the extent of learning that has taken place. Omole (2007) concurs, stating that assessment in education pertains to gauging the quantity of information acquired by pupils throughout the duration of an educational program. In alignment with the taxonomy of educational objectives, assessment serves as a means to evaluate the extent to which students have grasped the educational process.

For both students and teachers, assessment holds significant importance as it informs their actions and decisions. Students benefit from

feedback and insights gained from assessment, enabling them to understand their strengths and areas of improvement. In turn, teachers use assessment data to adapt instructional strategies, identify areas of concern, and provide targeted support to foster student learning.

Moreover, assessment plays a pivotal role in driving educational system educational ecosystem. (Koh, 2011). By systematically gathering data on student performance, educational institutions can identify trends, strengths, and areas of improvement within their systems. This data-driven approach enables educators and policymakers to design evidence-based interventions, shape curriculum improvements, and enhance overall educational outcomes.

Principles of Assessment

Assessment techniques, as outlined by Linn and Miller (2008), are firmly rooted in a set of fundamental principles. These guiding principles form the basis for meaningful and accurate assessment practices. Let us delve into each of these principles:

Assessment is based on predefined goals: The first principle of assessment is to establish specific assessment objectives. This involves clearly defining the scope of investigation and the purpose of the assessment. Precise details about the components of the program or process to be assessed must be predetermined. By doing so, the foundation is laid for subsequent phases in the assessment process (Marzano, 2009). In educational assessment, the declaration of intended learning outcomes plays a crucial role in setting assessment goals and guiding the assessment process effectively (Linn & Miller, 2008).

Selection of assessment methods: Each assessment method possesses its unique advantages and limitations, not all methods are suitable for every type of assessment (Brown, 2019). Additionally, the characteristics of the measurement instruments hold primary importance. The choice of a measuring instrument depends on the nature of the object being measured. Selecting the appropriate tool is essential when assessing various aspects such as behavior, knowledge, or abilities (Brookhart, 2011). For instance, using Multiple Choice Questions (MCQs) to assess critical writing skills would yield inaccurate evidence compared to employing Extended Response Questions (ERQs).

The use of a variety of approaches to ensure validity of assessment: A single assessment instrument may not provide comprehensive evidence for a meaningful and accurate evaluation. Employing diverse assessment methods can yield a more thorough and valid assessment outcome. Given the complexity of assessment, multiple instruments are necessary to gather accurate and valid data. For instance, while MCQs and short answer items may cover lower-level learning, extended type items can assess higher-level learning (Linn & Miller, 2012). This approach addresses evidence constraints and provides a comprehensive understanding of the phenomena under evaluation.

Fundamental knowledge of assessment procedures: Assessments can be classified into standardized instruments, such as achievement tests and aptitude tests, and basic or low-level assessment scales, like observational and self-report approaches. No assessment instrument or technique is entirely error-free. Instead, their quality depends on the extent to which measurement and evaluation scales are prone to errors. The reliability and validity of an

instrument define its standardization. Therefore, efforts must be dedicated to ensuring the psychometric qualities of assessment instruments, which are paramount (Stiggins & Chappuis, 2008).

By adhering to these principles of assessment, educators and evaluators can establish a robust foundation for effective evaluation practices. The careful consideration of predefined goals, suitable assessment methods, diverse approaches, and the reliability of assessment instruments collectively contribute to a comprehensive and accurate assessment process. The application of these principles enhances the validity of assessment outcomes and ensures that evaluation efforts align with the ultimate goal of fostering student learning and growth.

Types of Assessment

Assessment, as an indispensable aspect of the educational landscape, assumes two primary forms: formative and summative evaluations. Each type serves distinct purposes and plays a pivotal role in shaping the learning journey of students. Let us delve into the intricacies of these assessment paradigms:

Formative Assessment

Formative assessment is a dynamic process that revolves around gathering information about students' learning progress, providing them with timely feedback, and adapting teaching strategies accordingly underscore the central objective of formative assessment: to monitor and enhance students' comprehension and classroom engagement (Amedahe & Asamoah-Gyimah, 2016; Nsikak-Abasi & Akanaono, 2017; Nortvedt & Buchholtz , 2018). Often referred to as "assessment for learning," formative assessment occurs during

the teaching process. Its diagnostic nature facilitates the identification of students' learning challenges, paving the way for timely remedial actions to foster academic growth (Okyere, Kuranchie, Larbi & Twene, 2018). Crucially, feedback assumes a prominent role in formative assessment. By providing immediate feedback to students, educators empower them to recognize their learning strengths and areas for improvement. Beyond the mere assignment of grades, feedback entails meaningful interactions that delve into students' cognitive processes, facilitating the cultivation of desired higher-order cognitive abilities (Amua-Sekyi, 2016). Various techniques, such as project work, assignments, quizzes, presentations, and class assessments, encompass the spectrum of formative assessment methods.

Summative Assessment

The focus of summative assessment, also known as the assessment of learning (AoL), centres on students' performance at the conclusion of the instructional process. (Gonzales and Aliponga, 2012; Amua-Sekyi, 2016; Okyere et al., 2018) concur on the overarching purpose of summative assessment: to categorize students, assign grades, and communicate judgments to relevant stakeholders. This form of assessment centres on evaluating students' level of learning, verifying their achievements, and determining their academic grades (Gonzales & Aliponga, 2012). In essence, summative assessment represents a summary of students' accumulated knowledge and accomplishments at a particular level of their educational journey (Taras, cited in Asare, 2015).

Brown (2003) identifies three key goals of the summative assessment paradigm: reporting student progress and achievement, summarizing

achievement for certification, selection, and placement purposes, and providing insights into the efficacy and effectiveness of educational institutions, systems, and teachers. The focal point of summative assessment, as highlighted by NaCCA (2019), is to evaluate learners' growth and accomplishments, serving as evidence of their proficiency in a given course of study. In Ghanaian schools, summative assessment manifests in various forms (NaCCA ,2019a; MoE, 2018). final examinations, end-of-term examinations, projects (which may be evaluated for formative purposes), and portfolios (assessed for formative purposes during their development).

Embracing both formative and summative assessment methodologies empower educators to comprehensively gauge students' learning progress, make informed instructional decisions, and foster an environment of continual growth and achievement. These assessment approaches, when thoughtfully intertwined, synergistically contribute to the cultivation of a vibrant and impactful learning ecosystem.

Classroom Assessment

In the classroom, teachers assess the learning of their students, the success of their learning environment, and their teaching strategies. A classroom assessment, is defined by McMillan (2013), as:

"a broad and evolving conception of a procedure used by teachers and students to collect, assess, and use evidence of student learning for a variety of purposes, including determining their abilities and shortcomings, measuring how they are progressing towards ability goals, issuing grades, and providing feedback to parents" (p. 4).

In the United States, when school funding, teacher pay, and other incentives were closely tied with pupils' academic progress, it came into prominence as a result of public demand for school accountability. In order to make the process more objective and genuine, high-stakes examinations were first used in the United States of America, where public expenditures were recognised as being responsible. The performance of students on high-stakes assessments given at the state level was of interest to taxpayers in terms of the results of education. Similar to that, guardians also wanted to know how well their youngsters were doing in school (Sternberg, 2019).

High-stakes exams were seen as one of the prominent ways to hold teachers accountable as various movements throughout the globe increased the expectations for their responsibility. There is proof that these high-stakes examinations are prone to various psychometric mistakes, according to study results from assessment professionals (Cook & Beckman, 2006). In a similar vein, certain groups of the stack holding community among parents are also against these high-stakes assessments owing to the detrimental effects of these exams (Marzano, 2009; Stiggins, 2005).

Assessment beliefs, which have an impact on students' academic performance, are yet another aspect of assessment in the classroom. Assessment practices that are founded on the idea that students may develop result in instructors improving their lessons and students doing better academically. These procedures, also known as assessment for learning or formative assessment procedures, are reflected in learning (Cauley & McMillan, 2010).

In contrast to formative assessment's focus on learning progress, accountability assessment primarily yields summative scores for judging performance (Brown, 2012). These evaluations can fuel judgmental outcomes such as teacher promotions, salary increases, and decisions on retention (Johnso, Narayanan & Sawaya, 2013).

Differentiating Assessment, Test, and Evaluation: Clarifying these terms is crucial to avoid the common student misconception that they are interchangeable (Saragih, 2017). However, a deeper understanding reveals distinct nuances.

Tests operate as specific data collection instruments designed to measure a limited range of skills or knowledge, often at a single point in time (Saragih, 2017). Conversely, assessments encompass a broader set of tools and methods used to gather continuous information on student learning progress across various domains throughout the learning journey (Johnsen, 2021). This wider scope differentiates them from tests and emphasizes their formative function in guiding instruction and providing feedback to both students and teachers (Black & Wiliam, 2018).

Assessment, on the other hand, refers to the interpretive process of making judgments based on information gathered from assessments or tests (Johnsen, 2021). While both evaluations and assessments can utilize test data, the former applies a specific lens to make judgments about student proficiency, program effectiveness, or other designated goals (Saragih, 2017).

The distinction between a test and an assessment becomes particularly critical when considering psychometric errors, which can threaten the validity and reliability of the gathered evidence (Popham, 2011b). Teacher-created

classroom tests, due to their potentially limited scope and design, may be more susceptible to such errors (Linn & Miller, 2012). Standardized tests, while not immune, can mitigate these risks through rigorous development and validation processes (McMillan, 2013). However, relying solely on standardized tests overlooks valuable insights available through comprehensive assessments tailored by teachers within their specific learning contexts (Popham, 2009b).

Purpose of Classroom Assessment

Assessment in the classroom is seen as a crucial component of successful teaching and learning. It is crucial since it provides instruction to pupils on how to improve their performance and the learning process (Adie, 2013; Greenberg & Walsh, 2012). The purpose of classroom assessment is to offer feedback on students' development throughout time so that any mistakes or learning issues may be found and addressed.

According to studies, the process of teaching and learning includes assessments in the classroom, and that significant learning gains can be realised when it is incorporated into classroom practises (William, 2017). Alonzo (2016) have argued for the incorporation of assessment into teaching and learning because of the enormous impact assessment has on learning outcomes. It is impossible to exaggerate the significance of instructors to guarantee that assessment results in excellent teaching and learning.

Determining the goal of the assessment is crucial. This is because having this information will enable individuals who plan to utilise this assessment process to give it careful thought and boost their efforts to execute it correctly. Assessment in the classroom is seen as a crucial component of successful teaching and learning. It is crucial since it provides instruction to

pupils on how to improve their performance and the learning process (Popham, 2008). It is crucial to assess student performance in order to benchmark projects or programmes, place students in particular groups, or rank them for specific goals, and undertake research on teaching strategies or curricula (Asale, 2017).

Salvia Ysseldyke (1978) proposes five distinct goals for student assessment. These are used for screening, placement, designing and evaluating programmes, gauging personal development, and diagnosing. Although some assessments are versatile in purpose, others can only suit one function.

1. Screening: Routinely, a test of academic performance is conducted to assist identify pupils who may need further support. For instance, when selecting students for a subsequent course or for employment, a test may be administered, and those who do not satisfy the admissions criteria may be offered the appropriate support depending on their challenging areas
2. Placement: In a school, groups of students with various academic abilities are formed using assessment findings. For instance, students who are not ranked in the honours section are assigned to classes at lower academic levels (Niko, 2001). The results of the assessment are used to determine a student's placement in a group for an assignment or group work and to put them in a remedial programme. No learner is turned away; instead, people are organised according to comparable talents. It is easier to choose how to educate an individual as well as a group when their educational backgrounds are understood.

3. Programme planning and evaluation: The outcomes of the assessment are utilised to help develop new teaching methods or assess the success of current curricula or educational programmes.
4. Assessment of individual progress: Through the grades that each student receives, an assessment is used to track the development of the class as a whole. Students' test scores provide insight into their academic performance.
5. In learning activities when students have learning challenges, relevant material and characteristics are identified via diagnostic tests. Remedial help is provided to pupils who exhibit learning challenges.

Niko (2001) also listed the following additional goals for classroom assessment: selection, feedback to instructors and students, student motivation, judgments about counselling and guidance, credentialing, and certification.

1. Selection: Using predetermined criteria, assessment results are utilised to choose students for certain instructional activities. People who don't fit this criterion aren't given a chance to participate in that instructional activity. Creating an admission test, for instance, to choose students for a subject that a university will provide.
2. Feedback to students: Assessment results must inform students of their correct and incorrect responses to questions. Errors may be fixed during classes, and either the teacher or the pupils themselves can accomplish this.

3. Feedback to teachers: It is appropriate for the teacher to reteach a topic if the assessment result shows that pupils have not understood it.
4. Student motivation: Assessment aids in learning. Students are inspired to study more when they reach a specific degree of the learning objective. Those that struggle in a given exam are nonetheless driven to study in order to meet a learning objective.
5. Counselling and guidance: Assessment results supply information on students' aptitudes and interests, which is primarily used to help students explore and make life choices as well as give them instructions on how to prepare for chosen occupations. A person's career exploration is expected to include a set of continuous and evolving choices that may span their whole life.
6. Credentialing and certification choices have to do with how well pupils have learned a certain standard. It emphasises pupils achieving basic proficiency or significant levels, depending on the legal requirement of the state or via voluntary methods. Students are subjected to a state-developed evaluation process if a state legislation requires that they meet certain performance goals. Students who satisfy the requirement are given a certificate, a higher school diploma, for instance.

Concepts of Assessment Literacy

Assessment literacy refers to educators' mastery of appropriate assessment concepts in order to successfully construct assessments that translate learning objectives into assessment activities that precisely indicate

students' comprehension and accomplishment (Mertler & Campbell, 2005; Stiggins, 2002). Assessment literacy is described once more as the ability to measure what students know and can accomplish, analyse the outcomes of these tests, and use the findings to enhance students' learning and programme success (Webb, 2002). Rohaya and Mohd-Najib (2008) say that assessment literacy is how well teachers understand how to assess.

Understanding and using assessments appropriately requires knowledge of the theoretical and philosophical underpinnings of measuring students' development (Volante & Fazio, 2007). Teachers must be conversant with the fundamentals of good assessment practice, including vocabulary, the design and use of assessment techniques and procedures, familiarity with standards of quality in assessment, and understanding of alternatives to conventional learning measures (Matovu and Zubairi, 2014). Educators who are assessment literate, according to Stiggins (1991), must understand "what they are assessing, why they are doing so, how best to assess the accomplishment of interest, how to develop sound samples of performance, what may go wrong, and how to mitigate those issues before they occur" (p. 281).

Teachers may effectively practise the concepts, processes, techniques, and measurement techniques to aid in the learning process based on this understanding. As a result, it will provide instructors the ability to decide more accurately and fairly regarding their pupils, the curriculum, and educational initiatives. Fundamentally, assessment literacy exists when a person has the information and abilities linked to assessments that are necessary for them to carry out their duties effectively (Popham 2010). It entails familiarity with

formative and summative evaluation, in-person and online testing, as well as fundamental psychometric ideas (Deluca & Klinger, 2010).

Teachers' knowledge in assessment is critical for teachers to support and evaluate teaching and learning. Effective classroom assessment practices are critical for ensuring students are fulfilling educational goals. According to Coyle, Carter, Campbell and Talor, 2014), instructors need a more sophisticated grasp of evaluation in order to assist students meet the rising demands of the knowledge - based economy.

Along with the change in assessment methods, educators are now held to higher standards of public accountability. Interested parties now anticipate that educators will be able to provide a clear justification for the methodological approaches they use. Unfortunately, since they weren't historically educated in assessment, the majority of today's educators at practically all levels know nothing about it (Popham, 2004, 2009a). In reality, "the level of educators' assessment literacy is so pitifully low, which is one of the most critical challenges in today's education profession" (Popham, 2010, p. 175).

Importance of Assessment Literacy

Assessment literacy, a term coined by Stiggins (1991), refers to the understanding of "the methods, principles, problems, and consequences of assessment" (p. 389). This expertise empowers educators to discern "what to assess, how to assess, and what the good and bad effects of assessment are" (Stiggins, 1991, p. 389). Importantly, assessment literacy transcends mere technical skill; it fosters informed decision-making and fosters effective communication with stakeholders.

Several scholars have illuminated the critical role of assessment literacy in teachers' professional lives. Khadijeh and Amir (2015) emphasize the linguistic dimension, highlighting the need for teachers and students alike to navigate assessment terminology effectively. This linguistic fluency enables educators to understand student performance nuances, analyze data accurately, draw sound conclusions, and communicate clearly with various stakeholders (Khadijeh & Amir, 2015). Conversely, assessment illiteracy can distort evaluation conclusions, widen communication gaps, and influence assessment decisions negatively (Khadijeh & Amir, 2015). Moreover, Stiggins (2005) asserts that classroom assessment serves as a key indicator of effective teaching, further underscoring the value of assessment proficiency for instructors.

Newfields (2006) identifies three compelling reasons for prioritizing assessment literacy among educators:

1. Pervasiveness of Assessment: Firstly, assessment permeates every educational system. Kloser, Borko, Martínez, Stecher and Luskin (2017), concur, estimating that teachers dedicate 10-50% of instructional time to tasks related to assessment. Consequently, a significant portion of educational budgets are allocated to formal assessment practices (Newfields, 2006).
2. Understanding Educational Research: Secondly, proficiency in assessment literacy unlocks a deeper understanding of most educational literature. Statistical knowledge, for instance, empowers educators to critically analyze empirical research findings, interpret statistical analyses, and draw informed

inferences (Newfields, 2006). This statistical insight also fosters the development of a research-oriented attitude among teachers (Newfields, 2006).

3. Effective Communication and Self-Evaluation: Thirdly, assessment literacy allows teachers to effectively communicate student performance results to a diverse audience, including students, parents, colleagues, administrators, and other stakeholders (Newfields, 2006). Furthermore, it enables self-reflection and critical analysis of their instructional practices, ultimately leading to improved pedagogy and enhanced student outcomes (Newfields, 2006). Additionally, it equips teachers to communicate their classroom research findings to the broader community in a persuasive and technically astute manner (Newfields, 2006).

Popham (2010) posits two compelling arguments for mandating assessment literacy among pre-service teachers:

1. Accountability and Standardized Testing: Firstly, accountability—a cornerstone of various professions—holds true for education as well. Stakeholders, including government officials, community members, and parents, demand accountability from educators, whose performance is often evaluated based on student outcomes reflected in standardized tests (Popham, 2009a). While empirical evidence casts doubt on the efficacy of high-stakes standardized tests in accurately measuring teacher quality and student achievement (Popham,

2009b), assessment literacy empowers educators to critically evaluate such practices and advocate for alternative assessment methods. Additionally, it equips teachers with the knowledge to prepare their students for these tests effectively (Pastor & Andrade, 2019).

2. Enhancing Student Achievement: Secondly, Popham (2010) emphasizes the link between assessment literacy and enhanced student achievement. A nuanced understanding of assessment enables educators to leverage various assessment strategies to identify student learning gaps, personalize instruction, and promote academic progress (Lian, Yew & Meng, 2014). Wiliam (2006) concurs, highlighting research evidence supporting the synergy between effective teaching and assessment practices, ultimately leading to increased student engagement and knowledge acquisition. Assessment literacy also serves as a catalyst for continuous pedagogical improvement, fostering student motivation and enabling them to track their progress towards learning goals (Wiliam, 2006).

Alkharusi (2011a), underscores the central role of assessment in effective teaching practices, noting that teachers previously dedicated upwards of 50% of their instructional time to assessment activities. Assessment serves as the bedrock of effective instruction, with pre-assessment informing teacher planning based on student needs and learning styles, formative assessment facilitating real-time adjustments during instruction, and summative assessment providing insights into student.

Standards for Teacher Competence in Educational Assessment

Competencies are the skills and information that enable an educator to achieve success. To exploit academic achievement, educators must be well-versed in a vast array of abilities in a situation where dozens of crucial decisions should be made daily (Roberto & Madrigal 2018). This suggests that examining students is an important aspect of education and that outstanding instruction cannot exist without appropriate student assessment. The assessment competencies are the information and abilities required for a teacher to perform the position of educator.

There must be a precise set of educational assessment standards that instructors must adhere to in order to enhance their classroom assessment literacy. The practice of good classroom assessment would be improved if instructors had a set of specified assessment criteria (Magno, 2013). Magno points out that just a few nations or jurisdictions, such as the United States, New South Wales, and New Mexico, have these sets of particular evaluation requirements. The American Federation of Teachers (AFT), the National Education Association (NEA), and the National Council on Measurement in Education (NCME) collaborated to produce the Standards for Teacher Competence in Educational Assessment of Students in the United States.

Based on the notions that assessment is an integral part of instruction and that effective instruction cannot take place without the use of accurate student assessments, the National Council on Measurement in Education, the American Federation of Teachers, and the National Education Association (1990) established the ideals for teacher competence in educational

assessment of students. Both the professional responsibilities of instructors and their duty to evaluate pupils are covered by the Standards.

1. In order to make judgments regarding their lessons, teachers need to possess the necessary abilities to choose an acceptable assessment technique. For the use of data to assist instructional decision-making, it is necessary to be able to choose assessment techniques that are suitable, advantageous, simple to manage and conduct, technically adequate, and fair. Teachers must be knowledgeable with the sorts of data obtained from various types of assessments, as well as their advantages and disadvantages. Teachers in particular should get acquainted with assessment standards and the selecting of assessment techniques that are in line with lesson plans.
2. To make judgments regarding their students' teaching, teachers should have the necessary abilities to create an acceptable assessment. However, the bulk of the assessment data utilised in decision-making is likely to come from self-constructed assessment techniques used by instructors. Teachers often employ assessment tools that have been published or made available by other parties.
3. Teachers need to be able to organise, evaluate, and understand assessment results using both commercially accessible and proprietary approaches. Being competent to select and create effective assessment procedures is insufficient. Good evaluation techniques should be properly implemented by teachers. Additionally, they should be capable of managing, administering, scoring, and interpreting the results of various assessment methodologies.

4. The ability to create a method to guarantee the correctness of students' accomplishment levels based on assessments should be possessed by teachers. Since it reflects both the pupils' performance results and the values the educators place on that performance, assigning students' accomplishment levels is seen to be a significant component of educators' best standards. To guarantee that students are learning at the appropriate levels, educators should use assessment concepts.
5. In order to guarantee the correctness of students' accomplishment grades based on an assessment, educators should possess the necessary competencies. Assigning students' success levels is seen as a significant component of instructors' professional practices since it reflects both the teachers' values for the students' performance as well as their performance results. To guarantee that students' learning outcomes are correct, teachers should use assessment principles.
6. The ability to explain assessment findings to pupils, parents, related stakeholders, and other educators is a must for teachers. Teachers must regularly update parents and students on the results of assessments. Additionally, instructors are often requested to share or consult on the results of assessments with other educators as well as a variety of other audiences. Assessment results may not be utilised in a useful way or may not be used at all if they cannot be successfully conveyed. Teachers must be able to utilise assessment words correctly and explain the meaning, restrictions, and application of the assessment outcomes in order to properly communicate students' assessment results to others. Teachers may also need to assist the general public in

correctly interpreting the assessment results in addition to protecting their own assessment method and interpretation.

7. Teachers should be able to recognise unethical unlawful, or improper assessment practises and uses of assessment data. Teachers must be aware of their moral and legal obligations as well as their assessment-related responsibility. All student assessment activities, from planning and data collection to understanding, using, and presenting assessment results, must emphasise fairness, the rights of all persons involved, and the professional ethics of the field. Teachers should also work to stop improper behaviours as soon as they are discovered and engage more with the larger educational community to define the proper range of professional ethical guidelines for assessment.

Empirical Review

The empirical review in this study delves into the fundamental aspects of assessment literacy, classroom assessment practices, and their impact on students' academic achievement among junior high school professional teachers and students in the Sagnarigu Municipality of the Northern Region, Ghana. As education remains a pivotal cornerstone for societal development, it becomes imperative to critically examine the efficacy of assessment processes that shape the learning journey of students. This empirical review aims to explore and synthesize existing research literature to ascertain the relationship between assessment literacy, classroom assessment practices, and students' academic achievement.

Teachers' Assessment Literacy

In recent years, assessment literacy has emerged as a pivotal aspect of teacher professional development programs, garnering increased attention from researchers (Beziat & Coleman, 2015). This review delves into the empirical literature on teachers' assessment literacy, examining studies that probe into the knowledge, attitudes, and practices of educators in diverse educational settings. The critical analysis of these studies illuminates both the strengths and shortcomings of teachers' assessment literacy, ultimately underscoring the imperative for targeted professional development initiatives to bridge identified gaps.

Plake's (1993) national study in the United States offers a comprehensive overview of teachers' assessment literacy, utilizing the Teacher Assessment Literacy Questionnaire with 35 items aligned to specific standards. The instrument underwent rigorous content validation and pilot testing, yielding 555 usable surveys from a representative sample across 98 districts in 45 states. While the instrument demonstrated a reliability of 0.5, indicating moderate consistency, teachers averaged slightly over 23 correct responses out of 35 items. Notably, higher performance was observed in standard 3 (administering, scoring, and interpreting assessment results), while lower performance was noted in standard 6 (communicating assessment results). The overall average of 66% correct responses highlights a significant gap in teachers' preparedness for assessing student learning. However, relying solely on quantitative measures, such as averages, has limitations. The study calls for further exploration of individual standards and their varying levels of proficiency, as well as caution in interpreting results due to the reliability

coefficient of 0.5 raising questions about the internal consistency of the instrument.

Daniel and King (1998) contribute to the discourse by examining testing and measurement literacy among elementary and secondary school teachers in the United States. Their descriptive survey encompassed aspects of teachers' knowledge of testing and measurement, strategies employed in assessment, grades and content taught, and demographic information. Despite the limited expertise reported, teachers consistently utilized available knowledge to gauge student development. The study also revealed comparable levels of understanding and use of assessment practices across elementary and secondary teachers, suggesting a uniformity in the challenges faced by educators in different educational levels. While this study provides valuable insights into the practical utilization of assessment knowledge, it raises questions about the depth of teachers' understanding and the potential impact on instructional decision-making. The inherent limitation of self-reported data adds another layer of complexity, as teachers may overestimate their proficiency or be influenced by social desirability bias.

Quilter and Gallini's (2000) study at Eastern Michigan University delves into the intricate relationship between teachers' attitudes towards various assessment modes and their understanding of educational assessment. The study, involving 117 in-service instructors, employed canonical correlation and other correlational techniques for analysis. The findings indicated a marginal connection between attitudes and understanding, emphasizing the need for high-quality training in educational assessment for in-service teachers. While this study unveils an intriguing aspect of the

interplay between attitudes and understanding, the correlational nature of the research design limits the establishment of causal relationships. The complex interplay between attitudes and understanding necessitates further exploration through longitudinal studies or experimental interventions.

Maclellan's (2004) qualitative study in Scotland offers a nuanced perspective on teachers' conceptualization of assessment. Examining 30 novice teachers, the study found that while teacher candidates could articulate various assessment purposes and formats, their understanding of assessment theory, encompassing reliability, comparability, validity, and fairness, was limited. The compartmentalized nature of teachers' knowledge hindered the integration of formative and summative assessment purposes. This qualitative study enriches the literature by providing a deep dive into teachers' conceptualization of assessment. However, the sample size of 30 novice teachers may limit the generalizability of findings. Additionally, the study prompts further exploration into the factors contributing to the compartmentalization of assessment knowledge and its implications for effective teaching and learning.

In Thailand, Yamtim and Wongwanich's (2014) investigation into classroom assessment literacy among primary teachers uncovers a prevalent deficiency. Using a comprehensive questionnaire and focused group discussions with 19 primary school teachers, the study advocates for collaborative learning, teamwork, and mentorship as strategies to enhance classroom assessment literacy. This study adds an international dimension to the literature, shedding light on the challenges faced by primary school teachers in Thailand. However, the study's focus on a specific geographic

location and a relatively small sample size raises questions about the generalizability of the findings. Additionally, the advocacy for specific strategies demands further exploration of their effectiveness in diverse educational contexts.

Volante and Fazio (2007) investigated assessment literacy development in primary and junior teacher candidates. The study, using a questionnaire throughout a four-year teacher education program, revealed a predominant focus on summative assessments, neglecting formative activities. This partial view underscored the need for practical knowledge in assessment practices. Teacher candidates advocated for specific courses in assessment, recognizing their importance, and highlighted the crucial role of mentorship, particularly from associate teachers, in shaping assessment literacy.

Troudi, Coombe and Al-Hamly (2009) shifted the focus to English as a First Language (EFL) teachers in the United Arab Emirates, exploring their views on English language assessment in higher education. Using an open-ended questionnaire, the study collected data from 21 tertiary English language teachers. The findings highlighted a significant gap between teachers' philosophies and their actual assessment practices. Teachers reported being marginalized in the realm of assessment due to perceived lack of knowledge. The study exposed a disconnect between teachers' aspirations and the realities of their involvement in assessment-related decision-making processes. Teachers expressed frustration at being excluded from important curriculum decisions, reflecting a broader issue of top-down managerial approaches dominating the assessment landscape.

In a related study, Kiomrs, Abdilmehdi and Rashidi (2011) delved into the effect of teachers' assessment literacy on moderating the washback effect of summative tests in the context of English as a Foreign Language (EFL) teaching in Iran. Administering a test of assessment literacy and a questionnaire on English language teaching practices to 53 EFL secondary school teachers, the study uncovered several noteworthy findings. It revealed a generally poor knowledge base in language assessment among Iranian EFL teachers. Importantly, the study indicated that, irrespective of their level of assessment literacy, teachers tended to tailor their English teaching and testing to meet the demands of external tests. This finding raised questions about the alignment of assessment practices with broader educational goals and highlighted the need for a more comprehensive approach to teacher training and professional development programs.

In Malaysia, Sathasivam and Daniel (2011) conducted an investigation to gauge the assessment literacy of a selected group of Malaysian primary science teachers. The study utilized qualitative data collection techniques, including teacher journals and interviews with five primary school science teachers. The results shed light on the teachers' comprehension of assessment literacy, which predominantly emanated from a behavioral standpoint. External examinations significantly influenced their perceptions and approaches to classroom practices. Furthermore, the study revealed a limited depth of understanding of formative assessment practices among teachers, with potential implications for classroom practices and students' comprehension of scientific concepts.

Perry (2013), focused on the assessment literacy of high school principals in the state of Montana. An email invitation was dispatched to all active high school principals (N=169), inviting their participation in a survey. The survey encompassed various demographic inquiries, including years of experience in the classroom, years as a principal overall educational background, size of the school population, and geographic region. The survey also entailed an assessment of their level of assessment literacy, utilizing the Classroom Assessment Literacy Inventory (CALI). In total 32 principals and 14 teachers completed the survey.

The findings of the study disclosed that the level of teacher assessment literacy closely paralleled the outcomes from studies conducted in 1993 and 2003, where the CALI was utilized. Notably, the results indicated that the teacher scores on the CALI had remained relatively unchanged over a span of more than two decades. This finding raised concerns about the effectiveness of professional development efforts in enhancing assessment literacy among school leaders. It also emphasized the need for continuous and targeted initiatives to address the persistent challenges in this domain.

Piosang's (2017) study added to the discourse by presenting findings on the classroom assessment literacy of two distinct groups of educators: secondary English teachers (SET) and tertiary English teachers (TET). The study aimed to compare the assessment literacy levels between these two groups, utilizing the Classroom Assessment Literacy Inventory (CALI) to gauge their classroom assessment literacy (CAL). Surprisingly, despite both groups demonstrating poor levels of CAL teachers in basic education exhibited slightly higher scores on assessment literacy compared to their

counterparts in college. The detailed breakdown of CAL levels revealed that 85% of the SET group had poor CAL while 15% had fair CAL. In contrast, the TET group had 88% with poor CAL 5% with fair CAL and 7% with good CAL. The study employed a t-test for independent samples to analyze the data, revealing a significant difference between the levels of classroom assessment literacy of SET and TET ($p = 0.04$).

Hudaya's (2017) study in Indonesia provided a nuanced examination of teachers' assessment literacy, focusing on three critical dimensions: their preparedness in evaluating students' performance, proficiency in applying language assessment principles, and the perceived utility of a specially developed questionnaire. Engaging 43 in-service teachers, the study employed a 31-item questionnaire with a 4-point Likert scale, open-ended questions, and background information items. The results unveiled that a significant proportion of teachers (79%) felt adequately prepared in evaluating students' performance. Moreover, an impressive majority (88.7%) actively applied language assessment principles in their instructional practices. The study also indicated a high appreciation (86%) for the utility of the questionnaire as a valuable tool for the evaluation and design of language assessment tests. Hudaya's (2017) research provided valuable insights into the multifaceted nature of teachers' assessment literacy in Indonesia, offering a comprehensive view of their preparedness, classroom practices, and openness to specialized assessment instruments.

Moving to Nigeria, Kanu's (2017) study focused on assessing the classroom assessment literacy among secondary school teachers in the Federal Capital Territory. The research, involving 20 teachers, utilized a 22-item

questionnaire measured on a 4-point Likert scale. The findings revealed that the majority of secondary school teachers demonstrated an intermediate level of classroom assessment literacy. Significantly, the study identified inadequate training and retraining opportunities, such as seminars, as substantial obstacles to teachers' assessment literacy. To address this, the study recommended a range of professional development programs, including training sessions, workshops, seminars, and symposia, to continually enhance teachers' expertise and enable them to adapt adeptly to the evolving demands of new classroom assessment methods. The study also underscored the importance of integrating assessment skills into formal training programs for teachers to foster effective teaching practices. Kanu's work contributes to the understanding of the challenges faced by teachers in Nigeria and suggests practical strategies for enhancing their assessment literacy.

In Ghana, Amoako, Asamaoh and Bortey's (2019) study honed in on formative assessment knowledge among senior high school (SHS) mathematics teachers. Conducted as a descriptive cross-sectional survey, the study encompassed all 148 mathematics teachers in thirteen public high schools in the Cape Coast Metropolis. Findings indicated a limited understanding of formative assessment practices among the majority of SHS teachers. Additionally, the study revealed a positive correlation between teachers' knowledge of formative assessment and their actual implementation. To address these findings, the researchers recommended the implementation of regular workshops and in-service training programs for SHS mathematics teachers on formative assessment practices. This study provided specific

insights into the challenges and potential solutions related to formative assessment practices in Ghanaian high schools.

In a more recent study, Akoetey (2021) turned attention to nursing tutors in the Central Region of Ghana, examining their classroom assessment literacy and adherence to recommended principles in crafting multiple-choice items. Employing a descriptive survey design, the study encompassed the entire accessible population of nursing tutors. The findings indicated that the majority of tutors possessed a moderate level of classroom assessment knowledge. However, notable gaps in adherence to recommended principles in crafting multiple-choice items were identified. The study underscored the ongoing need for continuous professional development programs for nursing tutors to enhance their classroom assessment literacy and ensure alignment with established principles.

These studies collectively highlight the global significance of assessment literacy in education. From Indonesia to Nigeria and Ghana, common themes emerge, emphasizing the need for targeted professional development, workshops, and in-service training to fortify teachers' assessment knowledge and practices. Furthermore, the studies underscore the vital role of integrating assessment skills into formal teacher training programs. As education systems continue to evolve, these insights contribute to the ongoing dialogue on assessment literacy, emphasizing its critical role in effective teaching and learning across diverse educational settings.

Teachers Assessment Practices

Sofo, Ocansey, Nabie and Asola (2013) conducted a study to investigate the assessment practices of secondary physical education teachers

in Ghana. The participants consisted of 63 secondary physical education teachers (43 males and 20 females) who were purposively selected. Data were collected using an open-ended questionnaire and then analysed through qualitative content analysis involving both inductive and deductive approaches. The study's findings revealed that the teachers employed a variety of assessment practices, including observation, skill tests, knowledge tests, demonstrations, peer observations, and oral reports. The deductive analysis specifically highlighted that teacher observation was the most frequently used assessment method in practical lessons (70.11%), while oral reports were the least used (1.15%). In theory lessons, knowledge tests were the most common assessment method (81.43%), whereas individual reports were the least common (7.14%). Interestingly, the study indicated that the primary purpose of assessment for the teachers was to document learning rather than using it for accountability purposes.

Teachers' evaluation practises and abilities were examined in a study by Benzehaf (2017), at the Moroccan town of El Jadida, the study concentrated on English teachers at high schools. For the purposes of the study, both quantitative and qualitative data were collected. Forty (40) respondents which consisted of 24 male teachers and 16 female teachers were randomly sampled for the study. The respondents were English teachers in high school in the town of El Jadida. Both questionnaires and interview guides were used in data collection. The findings of the study indicated that teachers used varied number of assessment strategies ranging from home assignments to in-class written tests but mainly for summative purposes.

With reference to frequency of assessment, 72.5% of the respondents indicated that they assessed their students once a month; whereas 27.5% of the teachers stated they did so twice a semester. The findings of the study further showed that respondents also used a number of assessment practices. Among the assessment practices used by teachers included essay questions, true/false questions, and fill-in-the blanks. Similarly, Onyefulu (2018) conducted a study in Jamaica to determine the classroom assessment of primary (n=64) and secondary (93) school teachers. The results revealed that the teachers often used restricted essays, multiple-choice, fill-in-the-blanks, short answers, closed-book tests, and portfolios. Similarly, Suah and Ong (2012) examined the assessment practices of Malaysian in-service teachers (n=406) and found that teacher trainees often use traditional assessment methods.

Ogunkola (2013) investigated the instructional assessment practices patterns, techniques, and challenges of science teachers in Barbados. The study employed a cross-sectional survey design. The population for the study included all science teachers in secondary schools in Barbados. Science teachers included teachers of Biology, Chemistry, Physics, Integrated Science, Agricultural Science, and Human and Social Biology. Descriptive statistics (frequency and percentages), one-way Analysis of Variance (ANOVA), as well as one-sample t-test were used in analyzing the research questions. The findings of the study revealed that all the teachers used collaborative assessment practices. Such practices include discussing assessments with peers before administering and learning from other teachers through the sharing of ideas about assessment practices that work. Ninety-six percent of

the teachers reported that they assess students' skills and follow guidelines of the assessment development process.

Agu, Onyekub and Anyichie (2012) conducted a study that was geared towards the development and validation of an instrument for assessing test construction skills of secondary school teachers in Nigeria. The study developed and validated a Test Construction Skill Inventory (TCSI) for assessing the secondary school teachers' competencies in constructing classroom-based tests. Cronbach alpha was used to analyze data for research questions 1 and 2 while mean and standard deviation statistical procedures were used to analyze data for research question. The Test Construction Scale Inventory was found to be reliable with a coefficient of 0.73 and the secondary school teachers found almost all the 25 items important skills for quality classroom-based test construction.

The finding of the study revealed that almost all the teachers took the following skills into consideration while constructing test items: outlined the content covered for the term before setting test items form the content covered, prepared a test blueprint as a guide in the test construction process, ensured that the items are measuring the determined objectives , prepared a marking guide while constructing the test items, consulted standard text books in the subject for guide, gave clear instructions to guide the test takers, submitted tests meant for promotional examinations for expert editing on time. The findings of the study however revealed that quite a number of the respondents did not consider the following skills while constructing test items: avoid the use of interlocking items, avoid items that measure opinion.

In their study, Quansah and Amoako (2018), developed and validated a standardised instrument in measuring teachers' attitude towards test construction. The study further explored the attitude of teachers towards test construction. The instrument was developed based on literature as well as personal experiences of the researchers. The developed instrument was administered to 432 Senior High School teachers in the Cape Coast Metropolis. Through an exploratory factor analysis, four dimensions were obtained which include: planning, item construction, item review and assembling. A confirmatory factor analysis was then conducted to examine the factor loadings of the items. After critical evaluation, the items on the instrument remained 32 which was on a four-point Likert scale. Further analysis revealed an overall negative attitude of SHS teachers towards test construction.

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 nonprofessional teachers. Ololube (2008) emphasised 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.

In a different study, Onyechere (2000) discovered that some teachers create subpar tests while others continue to use copies of test items because they appear to lack test-creation skills. In addition, Senior High School (SHS) teachers in Borno State, Nigeria, created exercises that concentrated on lower cognitive activities (Hamafyelto, Hamman & Hamafyelto, 2015). According to Sajjad, Nasir, and Saif (2019), test construction has been identified as a

significant source of concern for many Nigerian teachers, particularly those with less expertise. This concern is mostly a result of these teachers' inexperience with creating tests.

Anhwere (2009) focused on classroom and instructor-made tests in his investigation into the testing practises of Ghanaian tutors at teacher training colleges. There were 230 male and 80 female tutors in the survey, which included 20 public schools. A questionnaire served as the primary tool, and the results were analysed using means, standard deviations, frequency, percentages, and the independent samples-t test. The findings indicated that tutors did not adhere to the fundamentals of testing when creating teacher-made or in-class examinations, and they saw assessment procedures as an additional burden on their teaching duties.

In a similar study, Quansah, Amoako, and Ankomah (2018) explored the test construction skills of Senior High School (SHS) teachers in the Cape Coast Metropolis. Using a qualitative document analysis, samples of end-of-term examination papers in Integrated Science, Core Mathematics and Social Studies in three selected SHS in the Cape Coast Metropolis were randomly (Lottery method) selected. The assessment tasks on the sampled instruments were critically examined by experts in the area of Educational Measurement and Evaluation.

The results revealed that the teachers have limited skills in the construction of end-of-term examinations. This was evident as issues were found with the content representativeness and relevance of the test, reliability, and fairness of the assessment task which were evaluated. It was recommended that head teachers take up the challenge of inviting resource

persons from recognised academic institutions to organise workshops for teachers on regular basis to sharpen teachers' skills on effective test construction practices.

Ogwang (2007) also stipulated that the process of examination administration is a difficult task, as it is sometimes marred by irregularities. Ogwang iterated that examination administration requires a lot of additional resources, both human and monetary ones to curb examination malpractices. Cottrell stressed the importance of ensuring proper management of tests to attain valid and reliable results (Cottrell, 2001).

According to Cottrell, administrators of tests should have the opportunity to comprehend their responsibilities as a prerequisite for achieving accurate test outcomes. Similarly, McMillan (2018) underscored that a well-prepared test is easy to administer, as compared with a poorly prepared test. Fontana further explained that it is equally important to realise that a successful test administration exercise is a product of test planning. Fontana concluded that cheating is most likely to occur in a poorly planned test, thus, proving a challenge to test administration.

In their study, Rukundo and Magambo (2010) advised that instructors should avoid giving hints to students who ask about individual items. The authors explained that if the item is ambiguous, it should be clarified for the entire group; instructors should however refrain from helping a pupil to answer an item if it is not ambiguous. Rukundo and Magambo further iterated that the challenge is that at times, refraining from giving hints to examinees who ask for help may be difficult especially for new comers in the field of

testing. Nevertheless, giving unfair aid to some students decreases the validity of the test results and lowers class morale.

The literature suggests traditional classroom assessment practices include paper pencil tests and summative approaches, lacking alternative methods like portfolios, rubrics, electronic assessments, authentic, performance-based, and ICT use. Limited studies on psychometric properties of assessment tools are also lacking.

Relationship Between TAL and CAP

The relationship between Teachers' assessment practices and their understanding of assessment principles has drawn increasing attention in recent years (Mertler, 2003; Alkharusi, Aldhafri, Alnabhani & Alkalbani, 2012). This focus stems from the recognition that effective assessment serves not only as a measurement tool but also as a powerful driver of student learning and professional development (Popham, 2010). Consequently, understanding the factors influencing teacher assessment practices, particularly their assessment literacy (AL), has become crucial for optimizing educational outcomes.

Mertler's (2003) study serves as an illustrative example. Investigating educators across various disciplines and grade levels, Mertler found a negative correlation between teachers' low AL and their utilization of statistical methods in assessment analysis. This suggested that teachers lacking fundamental insights into validity and reliability were less likely to engage in data-driven assessment practices.

Similarly, Black, Harrison, Hodgen, Marshall and Serret (2010) qualitative study explored 12 UK teachers' understanding of validity in

summative assessments and its impact on their practices. The findings revealed limited comprehension of validity principles among teachers, further highlighting the potential link between low AL and inconsistencies in classroom assessment implementation. These studies underscore the potential detrimental influence of inadequate assessment knowledge on teachers' assessment execution.

Ara and Saaed (2022) conducted a comprehensive study in Pakistan to specifically examine the relationship between primary school teachers' AL and their classroom assessment practices (CAPs). Employing a mixed-methods approach, they utilized online surveys to administer the Teachers' Assessment Literacy Test and the Teachers' Assessment Practices Questionnaire to 500 participants. Through a combination of descriptive statistics, correlation analysis, t-tests, and ANOVA, the study revealed a positive association between teachers' AL levels and their use of CAPs aimed at promoting learning.

While Ara and Saaed's study contributes valuable insights to the understanding of AL-CAP connections, it is important to acknowledge its limitations and encourage further investigation. potential self-reporting bias in the survey data necessitates qualitative follow-up studies to corroborate and enrich the quantitative findings.

In conclusion, recognizing the multifaceted nature of AL and its diverse influences on CAPs is essential for advancing educational assessment practices. While Ara and Saaed's (2022) study provides a valuable stepping stone, continued research, employing both quantitative and qualitative methods, is necessary to unravel this relationship and ultimately foster a

sustainable ecosystem of effective assessment for learning within diverse educational contexts.

Relationship Between TAL and Students' Academic Achievement

The field of education has recognized assessment literacy, encompassing educators' deep understanding and skillful application of assessment methodologies, as a cornerstone factor influencing student academic achievement (Pastore & Andrade, 2019; Khalid, Latif & Yusof, 2021). This review synthesizes seminal research delving into the relationship between teachers' assessment literacy and the academic achievement of their students.

The core premise that underpins the connection between teachers' assessment literacy and students' academic achievement lies in the educators' profound knowledge of assessment principles and methodologies. They must be adept at interpreting and utilizing assessment data effectively to inform instructional decisions and tailor learning experiences to maximize student progress (Popham, 2009a).

Ara and Saeed (2020) employed a causal-comparative research design to investigate the causal effect of teachers' assessment knowledge on student achievement in Science, Mathematics, and English. Utilizing a multi-stage random sampling technique, they selected 3347 students and a purposive sample of 127 primary school teachers who completed the Teachers' Assessment Literacy test, validated by experts and having a reliability of 0.76. Three standardized achievement tests measured student performance. Analysis using inferential statistics and arithmetic mean revealed a significant positive influence of teachers' assessment literacy on student academic performance.

Mellati and Khademi (2018) focused on the interplay between teachers' assessment literacy, their assessment practices, and student outcomes in the Iranian context. Their study sought to comprehend the extent to which teacher assessment literacy translates into effective practices and impacts student achievement. The results showcased a statistically significant influence of teachers' assessment literacy on student academic success, further demonstrating that assessment awareness fosters the development of effective and motivating assessment environments.

While both studies shed light on the crucial role of teacher assessment literacy in promoting student achievement, certain limitations warrant further investigation. Ara and Saeed's generalizability of their findings could be enhanced by studying diverse educational contexts. Mellati and Khademi's (2018) research, while providing valuable insights, would benefit from exploring the mediating factors through which assessment literacy influences student outcomes.

Relationship Between CAP and Students' Academic Achievement

The relationship between teachers' classroom assessment practices and student academic achievement has garnered considerable attention in educational research. This critical review delves into the existing empirical body of knowledge, aiming to illuminate key factors and dynamics shaping this crucial aspect of classroom practice.

A central theme permeating the literature is the critical role of classroom assessment practice on the academic achievement of students. Assessments that accurately reflect intended educational goals demonstrably influence student academic achievement (Hayati, Ediyani, Maimun, Anwar,

Fauzi & Suryati, 2020). Schneider and Preckel's (2017) study revealed a medium-to-large effect size for the impact of assessment practices on academic achievement. Brookhart (2017) further emphasized the significance of effective formative assessment in enhancing classroom learning, echoed by Stiggins (2005) and Popham (2011a) who highlighted the potential of well-designed assessments to promote academic progress.

Francisco and Celon (2020) conducted a study in Meycauayan City, Philippines, to investigate the relationship between teachers' instructional practices, including assessment, and student achievement in English, mathematics, and science. Their findings demonstrated varying but significant positive associations between effective assessment practices and student outcomes across all three subjects.

The literature also identifies the positive influence of diversifying assessment methods (Rasooli, Zandi & DeLuca, 2018). Employing a range of tools, such as quizzes, projects, and presentations, caters to diverse learning styles and fosters more holistic academic success. While formative assessments are pivotal for ongoing feedback and learning optimization, the literature acknowledges the continued relevance of summative assessments in providing a comprehensive picture of student achievement (Stiggins, 2001). Striking a balance between these two assessment types contributes to a more nuanced and meaningful evaluation of student progress.

While these studies offer valuable insights into the crucial link between assessment practices and academic achievement, they also necessitate further investigation. Francisco and Celon's study, for instance, could benefit from

elucidating the specific aspects of effective assessment practices contributing to improved outcomes.

Chapter Summary

The present study draws upon a theoretical framework that integrates three prominent perspectives: Agentic Theory, Planned Action Theory, and Reasoned Action Theory. This multifaceted approach allows for a comprehensive exploration of the relationship between assessment literacy, classroom assessment practices, and students' academic achievement. Within this framework, the literature review systematically delves into the research questions and hypotheses guiding the investigation, structured under the following headings:

a. Teachers' assessment Literacy.
b. Classroom assessment practices.
c. Students' academic achievement.
d. Relationship between teachers' assessment literacy and classroom assessment practices.
e. Relationship between classroom assessment practices and students' academic achievement.

The empirical findings concerning teachers' proficiency in assessment knowledge exhibit divergent perspectives on the assessment literacy of educators. The evidence suggests a spectrum of assessment knowledge among teachers, with some scholars indicating a moderate to high level, while others contend that certain educators exhibit a lower or insufficient degree of assessment literacy.

Likewise, within the domain of classroom assessment practices, conventional methodologies, such as traditional paper-and-pencil tests and summative evaluation approaches, predominated. Noticeably absent were alternative assessment practices, including portfolio assessments, utilization of rubrics, electronic assessment methods, authentic assessments, performance-based evaluations, and the active integration of information and communication technology (ICT) into the assessment process. The deficiency in attention to these alternative assessment practices, particularly at the primary, secondary, and tertiary educational levels, underscores a critical necessity for their implementation to facilitate student-centered assessments.

Additionally, a scarcity of studies examining the psychometric properties of assessment tools, encompassing dimensions of validity, reliability, and practicability, further accentuates the need for rigorous investigation. The exploration of these psychometric properties holds paramount importance in bolstering stakeholder confidence in the fidelity and utility of assessment outcomes. The empirical validation of relationships among teachers' assessment literacy, classroom assessment practices, and students' academic achievement in the field of education has been ascertained. These relationships were consistently confirmed as positive; however, the strength of association manifested variations, denoted as strong, moderate, and weak, respectively.

Conceptual Framework

The conceptual framework was offered in this section to help explain and connect the study's key variables. The framework included a graphical

representation of the study's objectives, which is useful for organising empirical research.

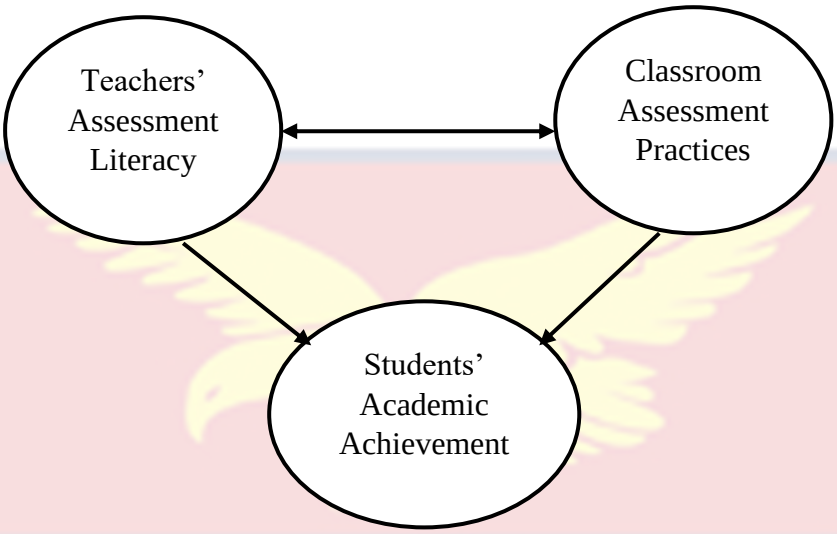

Figure 1: Conceptual Framework
Source: Field Survey (2023)

Chapter Summary

This chapter discussed relevant information that was needed to understand the study's objectives. It specifically presented the theories underpinning the study, conceptual and empirical reviews and concluded with a conceptual framework.

CHAPTER THREE

RESEARCH METHODS

Introduction

The purpose of the study was to investigate the relationship between teachers' assessment literacy, classroom assessment practices and students' academic achievements at Sagnarigu Municipality J.H.Ss. The chapter discusses how the study was conducted. It is divided into five parts. The first part deals with research design, and the second; deals with the population and sample and sampling procedure. The third part covers the research instrument (including pre-testing that was used) while the fourth part deals with data collection procedure. The last part covers how data collected was analysed.

Research Design

This study employed a descriptive, cross-sectional survey methodology grounded in a quantitative approach. Descriptive surveys facilitate the detailed characterization of existing conditions, trends, and phenomena (Fraenkel, Wallen, & Hyun, 2012). Spector, (2019) posits that cross-sectional surveys are particularly suited for investigating self-reported beliefs or behaviours. Amedahe and Asamoah Gyimah, (2015) further emphasize their role in systematically and accurately depicting factual characteristics.

This research design was chosen for its optimal alignment with the study's goals. It aimed to comprehensively depict the current landscape of assessment literacy among teachers, their classroom assessment practices, and their students' academic achievement levels. Amedahe (2002) highlights that descriptive research hinges on the existence of specific conditions or

relationships, seeking to portray activities, objects, processes, and individuals with pinpoint accuracy. By capturing data at a singular point in time, this design illuminates the interplay between teachers' assessment knowledge, their classroom practices, and students' academic achievements.

Furthermore, descriptive research offers valuable insights into specific questions of particular interest to the researcher (Edgar & Manz, 2017). However, acknowledging its limitations is crucial. Descriptive designs can be susceptible to bias if measurement instruments introduce distortions (Amedahe & AsamoahGyimah, 2015). Examples include response biases in questionnaires influencing findings. Additionally, such studies are unable to establish causal relationships, and researcher bias in question design or interpretation can pose a further challenge.

Study Area

In the Sagnarigu Municipality, the study will be conducted. The Municipality was created in 2012 from the Tamale Metropolitan. On March 15, 2018, it was elevated to Municipal status. Savelugu Municipality, Tamale Metropolitan, Tolong, and Kumbungu form its northern, eastern, southern, and western borders, respectively. The Municipality is fortunate to have a sizable number of establishments at all levels of formal education. The Municipality has over 100 junior high schools of which the majority are public. These public junior high schools are beneficiaries of several governmental interventions, notable among them is the Ghana Accountability for Learning Outcomes Project (GALOP). A project with the objective to improve the quality of education in low-performing basic education schools and strengthen education sector equity and accountability in Ghana. Sagnerigu Municipality

was chosen because of the recent records of poor academic achievements of students in BECE. Also, research works on teachers' assessment literacy, classroom assessment practices and students' academic achievement in the Municipality is limited or non-existing.

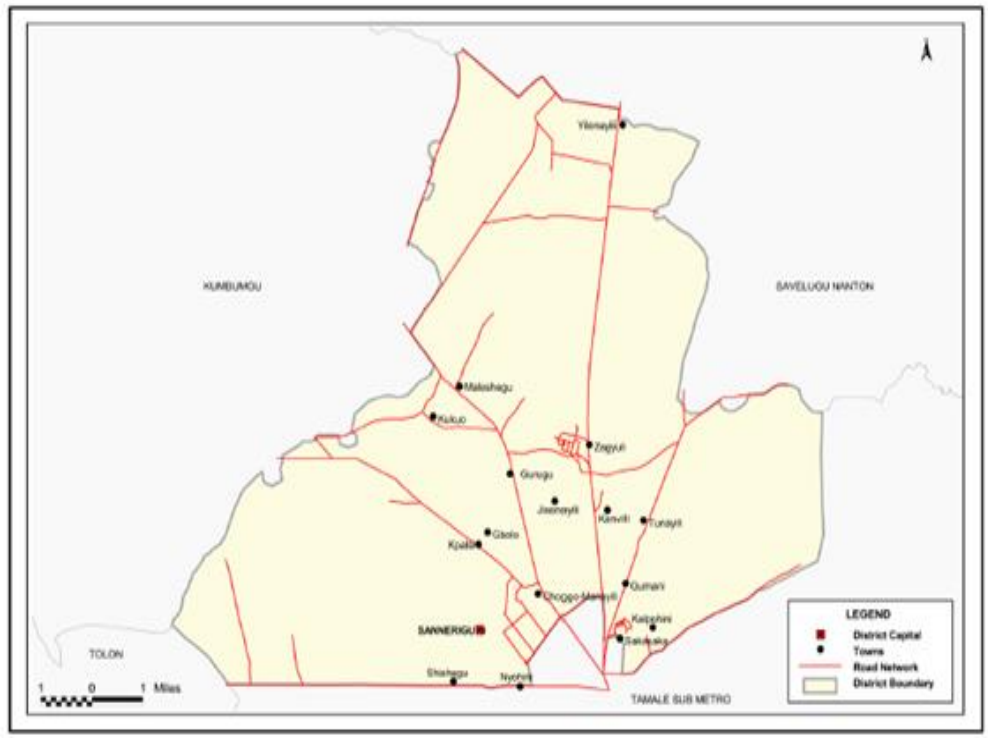

Figure 2: Map of Sagnerigu

Population

Target Population

The target population for this study was defined as all professional teachers (N = 1,257) and their respective students (N = 5,754) within all public junior high schools located within the Sagnarigu Municipality. This definition encompasses the entirety of the desired educational level and geographic region, aligning with principles of comprehensive sampling framework (Clark, Foster, Bryman & Sloan, 2021).

Accessible Population

Due to practical limitations and logistical considerations, the research employed an accessible population. This subset comprised professional teachers (n = 150) specifically teaching English Language, Mathematics and Science (EMS) program and their corresponding final-year students (n = 2,097) across all GALOP junior high schools within the Sagnarigu Municipality. By focusing on this specific cohort, the study ensures targeted data collection with a more homogenous group aligned with the research objectives (Cohen, Manion, & Morrison, 2018).

Table 1: Distribution of Teachers in their Respective Subject Areas

Mathematics	English	Science	Total
50	50	50	150

Source: GES, Sagnarigu Municipal education Directorate (2022)

Sampling Procedure

Research Participants

The investigation employed the purposive sampling technique to select a sample of 150 teachers (n = 150) from a total teacher population of 1,257, as well as 2,097 students from an overall student population of 5,754. Purposive sampling is recognized as a systematic method for selecting individuals who align with specific criteria deemed crucial to the research questions or study objectives (Andrade, 2020). Cohen et al (2018) elaborate on this approach, emphasizing the deliberate selection of cases that fulfil particular needs or objectives, thereby involving the exclusion of some population members while including others (Clark, et al 2021).

In adherence to this technique, inclusion and exclusion criteria were established to identify participants most relevant to fulfilling the study's purpose. The study specifically required participants who were final-year EMS professional teachers, willing to respond to questionnaires, and willing to provide their students' scores in the standardized district mock examination.

Consequently, all teachers from the total population were included in the study, given their interest and full participation, coupled with their willingness to provide students' scores. The selection of this sampling technique was deemed appropriate for the research, as it facilitated the identification of a sample most pertinent for examining teachers' assessment literacy, classroom assessment practices, students' academic achievements, and their relationship. As noted by Fraenkel et al. (2012), drawing conclusions about a population from a purposive sample may not be entirely suitable, as researchers cannot guarantee perfect representativeness. Nevertheless, when using purposive sampling, generalization becomes more plausible if data demonstrate the sample's representativeness concerning relevant variables within the intended population (Fraenkel et al., 2012).

Data Collection Instrument

The gathering of data is the most essential part of empirical investigations since it confirms the results and allows the researcher to generalise the findings to the wider audience. It takes effort, energy, and devotion to complete this hard operation. To collect information from the sample group for this study, two research instruments were used for the primary data and the third instrument relied on secondary data from the teachers involved in the study. An Assessment Literacy Questionnaire was

adopted from Akoetey (2021) and utilised in the research to gauge the teachers' assessment literacy level of teachers.

Three (3) components made up the design and organisation of the questionnaire. The respondents' backgrounds were examined in the first portion, Section A contains details like gender, age, professional qualifications in education, and number of years of teaching. 30 items in Section B had a dichotomous answer (true or false). Information about assessment literacy was gathered due to this. According to the Education Association's Standards for Teacher Competence in Educational Assessment of students, this component of the questionnaire was created (1990). The seven standards in this work are explained in detail on pages 36 to 38. For the purposes of this study, the standards were essentially grouped around the following topics: administration, scoring, and use of assessment results; planning and construction of classroom assessments; and ethical and legal issues in assessment.

A structured questionnaire was the tool utilized to collect information about teachers' practices of classroom assessment. Anhwere (2009)'s Teacher Characteristics Assessment Practices questionnaire was modified for this research and had 42 items. The 42 items were rated on a three-point Likert scale, from 3 (more often) to 1 (Not used). Due to the questionnaire's efficiency in gathering information from a lot of individuals quickly, it was adopted. There were five parts in the instrument. There are four items in Section A, which covers the respondents' background information. There are seven items in Section B, which is titled "Teachers' Assessment Modes and Formats." There were thirteen items in Section C, which dealt with teachers

testing construction techniques. Test administration, scoring practices, and grading practises are all covered in Parts D and E, respectively. There are five items in Section E and thirteen in Section D.

In the pursuit of understanding students' academic achievement in Mathematics, Science, and English language, raw scores of students of the district mock examination organised by the Sagnarigu Municipal education directorate were obtained from the individual headteachers' offices and teachers used in the study. The reason for the final mock examination test scores used in the study is that test items were developed by test experts and also all final year students in the Municipality took part in the examination making it a standardised test and fit for purpose.

Pilot Testing

Prior to full-scale administration, the research instrument underwent a pilot test involving thirty (30) junior high school teachers from St. Puls Junior High School and Kumbungu D/A Junior High School in the Northern Region of Ghana. The researcher personally administered the questionnaire to the designated teachers. This pre-testing phase served several crucial purposes, as outlined below:

The pilot test facilitated the refinement of the instrument, ultimately enhancing its content validity and reliability (Amedahe, 2002). A meticulous analysis of item responses was conducted, incorporating feedback from respondents regarding item weaknesses, clarity, and ambiguity across all aspects of the questionnaire. This analysis informed revisions to improve question wording, format, and scales. For instance, an item in Section B originally stated, "I use yes/no items to assess my students," was modified to

"I use true/false items to assess my students." Similarly, an item in Section C initially phrased as "I draft a scoring rubric immediately after constructing my items" was revised to "I prepare a marking scheme immediately after constructing my items." In total two items were rephrased and the overall item count was reduced to 38 due to identified redundancies.

The pilot-testing provided valuable insights into the appropriateness and practicality of the data collection instrument itself. Specifically, it allowed for testing the adequacy of the procedures planned for the main study, ensuring their effectiveness and efficiency in the larger data collection context (Clark, et al 2021). In essence, the pre-testing phase served as a vital "fine-tuning" exercise for the research instrument (Clark, et al., 2021). It provided an opportunity to identify and address potential issues prior to full-scale deployment, ultimately enhancing the accuracy, reliability, and validity of the data collected during the main study.

Validity and Reliability of the Instruments

As highlighted by Fraenkel, et al (2012), establishing the content and face validity of a research instrument is crucial for ensuring its accuracy and relevance. To achieve this, the questionnaires underwent an expert review process involving my supervisor. This review aimed to assess, Item-to-concept alignment, Response efficacy, Linguistic clarity, Logical organization, Item-section alignment, Ambiguity identification. The invaluable suggestions from the expert review were incorporated to refine the questionnaire, enhancing its content validity and face validity. This thorough review process contributed to the overall quality and credibility of the data collection instrument.

To assess the reliability of the items in the questionnaires, Kuder-Richardson 20 was applied to the teachers' assessment literacy questionnaire due to its dichotomous nature (true/false). For the instrument measuring classroom teachers' assessment practices, Cronbach's Alpha (α) was employed to gauge the internal consistency of its components. An alpha value of .70 or higher was deemed suitable, following the criterion established by Kılıç, (2016). Comprehensive information on the reliability coefficients is provided in Tables 2 and 3.

Table 2: Reliability Co-efficient of Piloted Instrument

No.	Name of Scale	No. of Items	Cronbach's Alpha
1.	Teachers' assessment mode and formats	7	.74
2.	Teachers' test construction practices	13	.72
3.	Test administration practices	6	.75
4.	Test scoring practices	7	.72
5.	Grading practices of teachers	5	.73

Source: Field Survey (2022)

As delineated in Table 2, subsequent to the pilot testing phase, the reliability coefficients for the scales of the instrument exhibited a range between .72 and .75. These coefficients, consistently surpassing the .70 threshold, signify commendable indicators of internal consistency within the instrument.

Table 3: Reliability Co-efficient of Final Instrument

No.	Name of Scale	No. of Items	Cronbach's Alpha
1.	Teachers' assessment mode and formats	7	.78
2.	Teachers' test construction practices	13	.76
3.	Test administration practices	6	.75
4.	Test scoring practices	7	.77
5.	Grading practices of teachers	5	.89

Source: Field Survey (2022)

After the main data collection, reliability analysis was done. The KR20 of the assessment literacy questionnaire was .77 and the reliability coefficients of the classroom assessment practices ranged from .75 to .89; an indication of good reliability, so these instruments were employed for the study (see appendix A).

Data Collection Procedures

The researcher was introduced as a student in an introduction letter from the Department of Education and Psychology (see appendix C). All during the investigation, the necessary ethical approval and permits were requested from the proper parties. To request authorization for the conduct of the research, an introduction letter was addressed to the Metropolitan Directorate of Education, Sagnarigu Municipality. Following acceptance, plans were formed on the precise days and hours for data collecting with the heads of the different schools. The researcher and three other research assistants toured the various schools to gather data on the predetermined days.

The teachers received the questionnaires individually and by hand. Then, those who received a response the same day were extracted. The

assistant headmaster was given custody of the remaining items, which were to be picked up in two weeks. Unfortunately, three out of the eleven schools had entirely lost the questionnaire by the time they arrived in the second week. For such schools, fresh questionnaires were produced and collected after two weeks. Overall, the data collecting process was completed in four weeks.

Data Processing and Analysis

The collected data underwent thorough editing, processing, and entry into the Statistical Package for Social Sciences (SPSS) software. To address research questions one (1), two (2), and three (3), descriptive statistics, including frequencies, percentages, and means, were employed. Furthermore, to assess the hypotheses formulated for one (1), two (2), and three (3), inferential statistics in the form of Pearson correlation were utilized. The significance level for the statistical analysis was set at 0.05, ensuring rigorous examination and interpretation of the data to provide meaningful insights into the research issues at hand.

Ethical Considerations

The ethical considerations underpinning this investigation were meticulously upheld, ensuring the protection and welfare of all participants. Respecting privacy, anonymity, and confidentiality was paramount throughout the research process. Prior to data collection, explicit permission from the respondents was sought, affording them the opportunity to make informed decisions about their involvement. A comprehensive explanation of the study's objectives was provided, and participants' consent was obtained through the signing of a consent form. It was emphatically communicated that their participation in the survey was entirely voluntary and not obligatory.

In order to safeguard the identities of the respondents, pseudonyms were utilized throughout the study, and the names of schools were kept confidential. Additionally, measures were implemented to prevent the linkage of individual responses to specific participants. By adopting this approach, the anonymity of the respondents was preserved, ensuring their comfort and reassurance in providing candid and truthful insights. The data obtained from the research were handled with utmost care and confidentiality. Strict measures were adhered to in protecting the information from unauthorized access.

The collected data were examined collectively, avoiding any attempt to identify individual responses. Moreover, the data were securely stored to safeguard against any potential breach of confidentiality. Throughout this investigation, ethical guidelines were scrupulously followed, prioritizing the well-being and rights of the participants. By maintaining the highest ethical standards, the research sought to uphold the integrity and credibility of the findings while safeguarding the dignity and privacy of the respondents.

Chapter Summary

The study examined teachers' assessment literacy level, classroom assessment practices, students' academic achievement, and their relationships in the Sagnerigu Municipality. The study was carried out employing the descriptive survey design, specifically, the cross-sectional design. Questionnaires and District mock examinations conducted by the Sagnerigu education directorate were used as the main data collection instruments. A 30 and 38-item instruments titled: " Teachers' Assessment Literacy Questionnaire and Classroom Assessment Practice Questionnaire were used to measure

teachers‟ knowledge and competencies in assessment and teachers' assessment practices in the classroom respectively where the district mock scores of students were obtained from the examination to measures students' academic achievement level.

The benefits associated with the use of a questionnaire are that its administration is easy and it takes relatively less time for participants to provide their responses to the set of items (Clark & Maguire, 2019). Nevertheless, Fervaha* and Remington (2013) have stated some likely problems that may affect the validity of a questionnaire. The following are some of the problems: (a) Most of the time, participants report what they believe or perceive is true but is not; (b) Participants may provide untrue responses that are more socially acceptable than what is happening in reality; and (c) Participants may give answers that they perceive the investigator wants to hear. The standardized district mock examination covered students‟ raw scores in English Language, Mathematics, and Sciences.

The total number of teachers that constituted the population for the study was 1,257 professional teachers and 5,754 students However, with the use of the purposive sampling technique, the study covered only 150 EMS professional teachers (n = 150) out of the 1,257 teachers and 2097 final year student (n =2097). Therefore, the conclusions which were based on the relatively small sample of teachers do not present a holistic view of the teachers' assessment literacy competencies and practices of the entire population of teachers considered for the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The research explored the relationship between EMS professional teachers' assessment literacy, classroom assessment practices, and students' academic achievement. Using the census survey and a descriptive cross-sectional approach, this research was conducted. Data from the respondents were gathered via a questionnaire. One hundred and fifty (150) questionnaires were administered. Therefore, for the purposes of data analysis, 150 observations, or 100%, were fully justified. This proportion surpasses Amedahe and Asamoah Gyimah (2015) claim that 5% to 20% of the size of the population is sufficient for generalisation. In this chapter, outcomes and analysis of the outcomes are presented. The demographic data regarding the respondents was presented first, followed by the responses to the research questions, and then the hypotheses.

Demographic Characteristics of Teachers

The findings about the respondents' demographic traits are presented in this section. Gender, age, professional background, and number of years of teaching were among the demographic factors addressed. Tables 4 through 7 show the results of frequency and percentage analysis of the data.

Table 4: Gender Distribution of Respondents

Gender	Frequency	Percent
Male	93	62.0
Female	57	38.0
Total	**150**	**100.0**

Source: Field Survey (2022)

Table 4 findings showed that 57 (38.0%) of the 150 respondents were women and 93 (62.0%) were male teachers. This suggests that males predominate in the teaching profession in Sagnarigu Municipal at the JHS.

Table 5: Age of Respondents

Age	Frequency	Percent
21-30	47	31.3
31-40	74	49.3
41-50	24	16.0
51-60	5	3.3
Total	**150**	**100.0**

Source: Field Survey (2022)

The Table 5 presents the distribution of respondents based on their age groups. A total of 150 respondents participated in the study. The respondents' ages were categorized into four groups: 21-30, 31-40, 41-50, and 51-60. The majority of the respondents fall within the age group of 31-40, accounting for 49.3% of the total sample. This suggests that a significant portion of the participants are in the early to mid-career stage as professional teachers. The age group of 21-30 constitutes 31.3% of the total respondents. This indicates the presence of a substantial number of relatively young teachers who may be early in their teaching careers or have recently entered the profession.

The age groups of 41-50 and 51-60 represent 16.0% and 3.3% of the respondents, respectively. This signifies the presence of a smaller proportion of more experienced and senior teachers within the sample. The distribution of respondents across age groups appears to be relatively balanced, with no single age group dominating the sample. This balanced representation

enhances the representativeness of the data and allows for a comprehensive understanding of the research phenomenon across different career stages.

Table 6: Professional Qualification of Respondents

Qualification	Frequency	Percent
Diploma	55	36.7
bachelor degree	79	52.7
master's degree	8	5.3
Med (Mphil)	8	5.3
Total	**150**	**100.0**

Source: Field Survey (2022)

Table 6 presents the distribution of respondents based on their educational qualifications. The total sample size consists of 150 respondents. The qualifications of the participants are categorized into four groups: Diploma, Bachelor Degree, Master's Degree, and Med (Mphil).

Bachelor Degree Dominance: The most prevalent qualification among the respondents is a Bachelor's Degree, accounting for 52.7% of the total sample. This indicates that a significant majority of the professional teachers have completed their undergraduate studies, which aligns with the educational requirements for teaching in many educational systems.

The qualification of Diploma represents 36.7% of the respondents. This suggests the presence of a considerable number of teachers who have obtained a diploma as their highest academic qualification. Both Master's Degree and Med (Mphil) qualifications are held by 5.3% of the respondents each. This indicates the existence of a smaller proportion of teachers with advanced postgraduate qualifications. The distribution of respondents across different qualification categories appears to be relatively balanced. While Bachelor's Degree holders form the majority, the presence of Diploma,

Master's Degree, and Med (Mphil) holders contributes to a diverse pool of educational backgrounds.

The varied qualifications of the respondents suggest a diverse range of professional expertise among the participating teachers. This diversity may impact their approaches to assessment literacy and classroom assessment practices.

Table 7: Working Experience of Respondents

Experience	Frequency	Percent
0-3	42	28.0
4-7	27	18.0
8-11	40	26.7
12 years and above	41	27.3
Total	**150**	**100.0**

Source: field study (2022)

Table 7 presents the distribution of respondents based on their working experience as professional teachers. The total sample size comprises 150 participants. The working experience of the teachers is categorized into four groups: 0-3 years, 4-7 years, 8-11 years, and 12 years and above.

The data reveals a diverse distribution of respondents based on their years of working experience as teachers. The majority of the participants fall into the categories of 0-3 years, 8-11 years, and 12 years and above, accounting for 28.0%, 26.7%, and 27.3% of the total sample, respectively. The category of 4-7 years encompasses 18.0% of the respondents, suggesting a considerable representation of mid-career teachers within the sample. The presence of 28.0% of respondents with 0-3 years of experience indicates a significant number of early-career teachers who are relatively new to the teaching profession. The categories of 8-11 years and 12 years and above

include 26.7% and 27.3% of the respondents, respectively. This indicates the involvement of a substantial proportion of experienced teachers with an extensive tenure in the teaching profession.

Table 7 provides valuable insights into the working experience of the participants, enabling researchers and readers to understand the varied backgrounds and tenure of professional teachers involved in the study. The diverse representation of early-career, mid-career, and experienced teachers contributes to the richness of the data and facilitates a more comprehensive analysis of the research questions and hypotheses concerning the relationship between assessment literacy, classroom assessment practices, and students' academic achievement across different stages of teachers' careers. Understanding the working experience of the participants is crucial for contextualizing the results and drawing meaningful conclusions about the influence of experience on the research findings.

Main Results

The study's primary findings are presented in this section. According to the study questions and hypotheses, the findings are given.

Research Question One: What is the assessment literacy level of junior high schools' EMS professional teachers in Sagnarigu Municipality of the northern region, Ghana?

This research question aimed to ascertain the extent of respondents' proficiency in classroom assessment. A total of 30 True/False items were administered to elicit responses, focusing on the factual aspects of classroom assessment. The participants' responses to each item were scored, distinguishing between correct and incorrect answers. The data were

subsequently tabulated in terms of frequencies and percentages. Correct scores denote the count and percentage of respondents who accurately answered an item, while incorrect scores represent those respondents who provided an erroneous response to a given item. Comprehensive results pertaining to this research question are systematically presented in Tables 8 and 9, providing a detailed examination of respondents' knowledge levels in the domain of classroom assessment.

Table 8 provides valuable insights into the assessment literacy of the participating teachers by presenting their responses to a set of assessment-related items. The responses are categorized into two sections: "Planning and Construction of Classroom Assessment" and "Administration, Scoring, and Use of Assessment Results." Additionally, a third section addresses "Ethical and Legal Issues in Assessment."

Planning and Construction of Classroom Assessment: majority of the teachers (83.3%) recognize the importance of considering the ease of creating the assessment when selecting an assessment technique. This understanding indicates their awareness of the practical aspects of designing assessments. An overwhelming proportion of teachers (98.7%) acknowledge that providing students with problem-solving exercises is an effective approach to evaluate their reasoning abilities. This finding reflects the teachers' awareness of the value of higher-order thinking skills assessment. A significant number of teachers (68.0%) agree that designing questions requiring students to define, recollect, and restate helps in measuring their ability to organize ideas rather than merely repeating facts. This demonstrates their understanding of the importance of assessing higher cognitive processes.

Administration, Scoring, and Use of Assessment Results: The vast majority of teachers (94.0%) correctly recognize that test results are considered reliable when they accurately represent the taught material. This indicates their understanding of the concept of reliability in assessment. A high percentage of teachers (93.3%) believe that data on students' performance on quizzes or in-class exams are more effective for changing teaching than data on final exam results. This reflects their awareness of the importance of formative assessment data. The majority of teachers (88.0%) correctly identify that a student's score of 80 in a class with an average grade of 65 could be considered outstanding. This demonstrates their grasp of interpreting assessment results in the context of the class performance.

Ethical and Legal Issues in Assessment: A significant proportion of teachers (86.7%) recognize the importance of ensuring that assessment methods are free from prejudice and preconceptions based on gender, ethnicity, socioeconomic status, and religion. This highlights their awareness of the ethical considerations in assessment. The majority of teachers (93.3%) understand the importance of obtaining students' permission before sharing their assessment comments with others. This reflects their commitment to respecting students' privacy and confidentiality.

Overall, the table provides valuable information about the assessment literacy of the participating teachers. The majority of the teachers demonstrate a good understanding of assessment principles and practices, indicating a level of competence in assessment literacy. However, there are some items where a significant proportion of teachers answered incorrectly, indicating potential areas for improvement and targeted professional development. The findings

from this table can guide the development of interventions to enhance teachers' assessment literacy, ultimately contributing to more effective classroom assessment practices and improved student learning outcomes.

Table 8: Assessment Literacy of EMS Teachers'(n = 150)

S/N	Items	Correct		Incorrect	
		Fre	%	Fre	%
	Planning and Construction of Classroom Assessment				
1	It is recommended that you consider the ease of creating the assessment into account when selecting an assessment technique.	125	83.3	25	16.7
2	After creating the exam items, a teacher must create a marking guide.	135	90.0	15	10.0
3	Giving pupils a problem-solving exercise is the most efficient approach to evaluate the reasoning they used to reach a decision.	148	98.7	2	1.3
4	Tests need to be written by the teacher to be understandable by both high and poor achievers.	134	89.3	16	10.7
5	Using multiple-choice assessments is the most efficient method for a teacher to gauge their students' aptitude for putting things together, arranging them, and combining them to form patterns.	110	73.3	40	26.711
6	The test's reliability is improved by including additional items.	114	76.0	36	24.0
7	It is preferable to design questions that require students to define, recollect, and restate in order to measure students' ability to organise ideas rather than merely repeating facts.	102	68.0	48	32.0
8	Compared to multiple-choice questions, essay exam grading is more objective.	122	81.3	28	18.7
9	While designing a test, a teacher should create test items that address each necessary level of the cognitive domain.	110	73.3	40	26.7
10	Multiple assessments should be used by teachers to gauge how much their pupils have learned.	104	69.3	46	30.7
11	The methods of assessment utilised	121	80.7	29	19.3

	in class should take into account the requirements of students with special needs or impairments.				
	Administration, Scoring and Use of Assessment Results				
12	When test results correctly represent the material that was taught, they are considered to be reliable.	141	94.0	9	6.0
13	It is possible to change teaching more effectively with data on students' performance on quizzes or in-class exams than it is using data on their performance on final exam results.	140	93.3	10	6.
14	Students should be given tests at any time, even when they are not informed in advance.	111	74.0	39	26.0
15	Students should be given a lot of time while being tested.	111	74.0	39	26.0
16	Testing should be conducted in well-ventilated, well-lit spaces.	103	68.7	47	31.3
17	The marking rubric should be properly followed while scoring tests.	110	76.9	33	23.1
18	If the average grade in a class is 65, then Kweku's score of 80 could be considered outstanding.	132	88.0	18	12.0
19	Ama is a good student because she does better than more than half of the other students in her class.	122	81.3	28	18.7
20	It is important to compare a student's performance to that of their classmates if a teacher wishes to gauge how much they have learned a certain subject.	130	86.7	20	13.3
21	Teachers should prioritise an achievement on multiple tests while grading them.	127	84.7	23	15.3
22	Teachers should comment on students' assessments.	134	89.3	16	10.7
	Ethical and Legal Issues in Assessment				
23	It is better to evaluate pupils using test samples from textbooks if a tutor wishes to know whether or not students have mastered certain educational goals.	132	88.0	18	12.0
24	When exam questions are chosen from previously asked questions or	134	89.3	16	10.7

	textbooks that have been published, it is better to evaluate pupils.				
25	Assessment methods should be devoid of prejudice and preconceptions based on gender, ethnicity, socioeconomic status, and religion.	130	86.7	20	13.3
26	Teachers should be particularly harsh with students who skip class and generous with those who attend regularly while grading their exams.	130	86.7	20	13.3
27	Without the student's permission, teachers shouldn't share their comments on their assessments with anyone else.	140	93.3	10	6.7
28	Teachers should be in charge of preserving students' right to privacy and maintaining the confidentiality of their assessment findings.	127	84.7	23	15.3
29	Before utilising copyright materials in assessment, teachers are not required to get permission.	145	96.7	5	3.3
30	Instead of using a single evaluation as a tool for punishing or restraining students' behaviour, teachers should consider students' performance in light of the learning goals covered in class.	135	90.0	15	10.0

Source: Field Survey (2022)

In table 9, respondents' responses to each item were initially coded as 1 for correct and 0 for incorrect answers. Subsequently, individual scores spanned from 0 to 30. These scores were then stratified into three categories: scores from 0 to 10 denoted a low level of knowledge, scores from 11 to 20 were categorized as moderate knowledge, and scores from 21 to 30 were indicative of a high level of knowledge in assessment. Notably, respondents predominantly fell within the moderate and high assessment literacy categories, as delineated in Table 9. The table provides a comprehensive presentation of the frequency distribution of respondents' scores based on their levels of assessment knowledge.

Table 9: Assessment Literacy of EMS Teachers

Assessment literacy	Score range	Frequency	Percent
Low	0-10	36	24
Moderate	11-20	40	27
High	21-30	74	49
Total		**150**	**100.0**

Source: Field Survey (2022)

Table 9 presents the assessment literacy levels of Junior High School (JHS) professional teachers based on their scores. The assessment literacy scores are divided into three categories: Low, Moderate, and High.

Low Assessment Literacy: The "Low" assessment literacy category includes teachers who scored between 0 and 10. This category comprises 36 teachers, accounting for 24 % of the total sample of 150 junior high professional teachers. These teachers demonstrate a lower level of understanding and knowledge of assessment practices.

Moderate Assessment Literacy: The "Moderate" assessment literacy category includes teachers who scored between 11 and 20. This category consists of 36 teachers, representing 27% of the total sample. These teachers exhibit a moderate level of assessment literacy, indicating a reasonable understanding of assessment practices but with room for improvement.

High Assessment Literacy: The "High" assessment literacy category includes teachers who scored between 20 and 30. This category comprises the largest group, with 74 teachers, making up 49 % of the total sample. These teachers demonstrate a high level of assessment literacy, indicating a strong understanding of assessment principles and practices

Research Question 2: What are the assessment practices of junior high school EMS professional teachers in the Sagnarigu Municipality?

The purpose of this study question was to learn more about the assessment practices of public basic schools' professional teachers in the Sagnarigu municipality. A three-point Likert scale with (38) items was used to assess this concept (More Often, Often, Not Used). There were four parts to the instrument. There are seven items in Component A, which is about "Teachers Assessment Modes and Formats." Thirteen items made up Component B, which is about teachers' test construction techniques. The administration of tests and teachers' scoring and grading practices, respectively, are also covered in components C and D. Thirteen items are in Section C, while five are in Section D.

The replies of the respondents were analysed using descriptive statistics of frequencies and percentages, and the findings are displayed in Table 10.

Table 10: Classroom Assessment Practices of Teachers'

s/n	Items	More often		Often		Not used	
		Fre	%	Fre	%	Fre	%
	Teachers Assessment Modes and Formats						
1	After teaching, I immediately offer my pupils tests to gauge their progress.	63	42.0	83	55.3	4	2.7
2	I assign homework for assessment.	101	67.3	44	29.3	5	3.3
3	During class times, I assess my pupils by asking them oral questions.	105	70.0	45	30		
4	At the end of the term, I administer tests to evaluate my pupils.	105	70.0	45	30	00	00
5	I use essay questions to evaluate my pupils.	64	42.7	82	54.7	4	2.7
6	I use true/false items to assess my students	30	20.0	54	36.0	66	44.0
7	I construct multiple – choice items to assess my students	42	28.0	58	38.7	50	33.3
	Teachers Test Construction Practices						
8	Two weeks before to the exam date, I construct each test item.	67	44.7	66	44.0	17	11.3
9	As soon as my items are constructed, I create a marking system.	13	8.7	73	48.7	64	42.7
10	I made copies of questions from previous BECE test questions.	34	22.7	77	51.3	39	26.0
11	I only create tests when it is time to evaluate students.	23	15.3	5	3.3	122	81.3
12	While creating test items, I use a test specification table.	8	5.3	13	8.7	129	86.0
13	I copy exam questions from books.	114	76.0	16	10.7	20	13.3
14	I match test items with instructional goals. .	49	32.7	74	49.3	27	18.0
15	I base the items I create on knowledge that pupils already acquire.	63	42.0	54	36.0	33	22.0
16	I set up objective exam answers in a specific order so that scoring is simple.	15	10.0	9	6.0	126	84.0
17	When creating test items,	5	3.3	16	10.7	129	86.0

	I take into account the test's objective.						
18	Teachers at my school get in-service training in test construction.	48	32.0	76	50.7	26	17.3
19	Before reviewing and selecting test items, I prepare more than is necessary.	4	2.7	22	14.7	124	82.7
20	Before creating the final copy, I examine the test as a whole.	19	12.7	17	11.3	114	76.0
	Teachers Test Administration practices						
21	To stop pupils from mimicking one another, I make sure that the sitting is appropriate.	92	61.3	40	26.7	18	12.0
22	I warn pupils that they must write quickly on exams or they will fail.	28	18.7	68	45.3	54	36.0
23	I anticipate and plan for emergencies during exams.	103	68.7	37	24.7	10	6.7
24	I provide guidance to students who inquire about specific test items during exams.	11	7.3	21	14.0	118	78.7
25	When I oversee tests or examinations, I read books, newspapers, or WhatsApp friends.	34	22.7	42	28.0	74	49.3
26	I provide students with prior notice of the subjects and content covered in exams and assessments.	40	26.7	83	55.3	27	18.0
	Teachers test Scoring Practices						
27	I score essay tests, question by question.	55	36.7	58	38.7	37	24.740
28	When students have taken the exam, I create marking schemes for essay questions.	20	13.3	65	43.3	65	43.3
29	To make sure that my grading is consistent, I regularly rescore previously graded papers.	10	6.7	30	20.0	110	73.3
30	I grade answer scripts of students whose identities I am familiar with.	26	17.3	63	42.0	61	40.7
31	While scoring the	12	8.0	51	34.0	87	58.0

	remaining items, I hide the items that have already been scored.						
32	My evaluation of the first few essays affects the remainder of my ratings.	51	34.0	61	40.7	38	25.3
33	When grading essays, I provide a separate score for writing mechanics including proper grammar, expression flow, etc.	48	32.0	76	50.7	26	17.3
	Grading Practices of Teachers						
34	I solely use the grade I give students to describe their academic achievement.	15	10.0	21	14.0	114	76.0
35	I issue grades on purpose to penalise students who do not learn.	67	44.7	38	25.3	45	30.0
36	I use grades to encourage all pupils to work more in their studies.	77	51.3	51	34.0	221	4.7
37	In my institution, I employ a standard-based grading system.	87	58.0	46	30.7	17	11.3
38	My grading is influenced by a student's behaviour, including attitude, effort, and behaviour.	105	70.0	36	24.0	9	6.0

Source: Field Survey (2022)

Table 10 provides insights into the classroom assessment practices of Junior High School (JHS) teachers in the Sagnarigu Municipality. It presents the frequencies and percentages of teachers' responses to various assessment-related items, categorized into three groups: More often used, often used, and not used.

Teachers' Assessment Modes and Formats: The majority of teachers (55.3%) indicated that they often offer tests to gauge their students' progress immediately after teaching, while 42.0% reported doing this more often. Only a small proportion (2.7%) stated that they do not use this assessment practice.

Homework is commonly used for assessment, as reported by 67.3% of teachers, while 29.3% said they often use it. A minor percentage (3.3%) do not utilize homework as an assessment tool. 70.0% of teachers often assess their pupils during class times by asking them oral questions, with 30.0% doing this more often. Similarly, 70.0% of teachers reported often administering tests at the end of the term, while 30.0% do this more often. No teacher indicated not using end-of-term tests.

Teachers' Test Construction Practices: Essay questions are moderately used for assessment by 42.7% of teachers, while 54.7% reported using them more often. Only 2.7% stated not using essay questions. True/false items are more often used by 36.0% of teachers, followed by 20.0% who use them often. A significant percentage (44.0%) does not use true/false items for assessment. 38.7% of teachers often construct multiple-choice items for assessment, while 28.0% use them more often. 33.3% do not use multiple-choice items.

Teachers' Test Administration Practices: Most teachers (61.3%) make sure that students sit appropriately during exams to prevent cheating, while 26.7% do this more often. Only 12.0% stated not using this practice. 55.3% of teachers often provide students with prior notice of the subjects and content covered in exams and assessments, followed by 26.7% who do this more often.

Teachers' Test Scoring Practices: Essay tests are scored question by question more often (38.7%), with 36.7% of teachers doing this often. Only 24.7% do not use this scoring practice. The practice of hiding scored items

while scoring the remaining ones is used more often (34.0%) compared to often (8.0%), with 58.0% of teachers stating not using this approach.

Grading Practices of Teachers: The majority of teachers (76.0%) solely use the grade they give students to describe their academic achievement, while 14.0% do this often. Only 10.0% do not use this grading practice. Grades are used to encourage all pupils to work more in their studies more often (51.3%) compared to often (25.3%), and 30.0% of teachers do not use grades for this purpose.

Research Question 3: What is the level of BECE candidates' academic achievement in the district mock examination organised by the Sagnarigu Municipal?

The study's objective was to determine how well students (BECE hopefuls) performed academically on the district mock test in the fields of science, maths, and English. Analysis was conducted using the scores of the district mock examination conducted by the Sagnarigu municipal education directorate. The raw scores obtained by the students were examined using descriptive statistics based on frequencies, percentages and mean, however, the means sores were representative of the 20,79 raw scores of each of the 50 GALOP schools in the EMS and was used for the correlation in the hypotheses Table11 provide the findings.

Table 11: Distribution of Students' Academic Achievement levels

	Above average		Average		Below average	
	Freq.	%	Freq.	%	Freq.	%
English	264	12.57	135	6.43	1,698	80.86
Mathematics	195	9.29	87	4.14	1815	86.43
Science	298	14.19	136	6.48	1663	79.19

Source: Field Survey (2022)

Table 11 provides a detailed examination of student academic achievement levels in English, Mathematics, and Science, categorized as "Above Average," "Average," and "Below Average."

From the table with regards to the academic achievement level of students in English Language, 264 students (approximately 12.57%) scored above Average, 135 students (approximately 6.43%) scored Average and 1,698 students (approximately 80.86%) scored Below Average. The majority of students (80.86%) fall below the average category in English, indicating a need for targeted interventions and focused educational strategies to enhance achievement.

With regards to the academic achievement level of students in Mathematics, 195 students (approximately 9.29%) scored Above Average, 87 students (approximately 4.14%) scored average, 1,815 students (approximately 86.43%) scored below Average. Similar to English, Mathematics exhibits a significant majority (86.43%) in the "Below Average" category, emphasizing the importance of tailored interventions to address specific challenges.

The academic achievement level of students in science indicated that, 298 students (approximately 14.14%) scored above Average, 136 students (approximately 6.48%) scored Average and 1,663 students (approximately 79.19%) scored below Average. Science demonstrates a more balanced distribution, with a noteworthy number of students classified as both "Above Average" and "Below Average." This suggests a varied range of proficiency levels.

It is concluded from the table that, the majority of students across all subjects fall within the "Below Average" category, indicating a pervasive trend that requires targeted educational interventions.

Results From Research Hypotheses

The outcomes of the hypothesis testing were presented in this section (Table 12–14). Three different hypotheses were all put forward and examined. These are as follows:

H01: There is no significant relationship between teachers' assessment literacy and classroom assessment practices.

The aim of this hypothesis was to determine the relationship between teachers' assessment literacy and classroom assessment practices. This hypothesis was tested using Pearson correlation. To make sure that there were no breaches of the assumption of normality, preliminary checks were carried out. This is presented in appendix C. Table 12 presents the analysis.

Table 12: Relationship Between TAL and CAP

	1	2	Sig
Teachers Assessment literacy (1)	1		.035
Classroom Assessment Practices (2)	.708	1	150

Correlation is significant at the 0.01 level (2-tailed).
Source: Field Survey (2022)

The correlation analysis revealed a significant positive relationship between classroom assessment practices and teachers' assessment literacy (r = .708, p = .035, N = 150).

Research hypothesis 2 to 4:

$2H_0$: There is no significant relationship between English language teachers' assessment literacy and students' academic achievement in English language.

$3H_0$: There is no significant relationship between Mathematics teachers' assessment literacy and students' academic achievement in Mathematics.

$4H_0$: There is no significant relation between integrated science teachers' assessment literacy and students' academic achievement in integrated science.

The aim of research hypothesis 2 to 4 was to investigate the relationship between EMS teachers' assessment literacy and students' academic achievement in English language, Mathematics and integrated Science. Mean scores of each school under the 50 GALOP schools in the study were obtained from the students' academic achievement raw score (20,79) of each subject to serve a representative sample for purposes of the correlation test. Pearson's correlation coefficients were computed. The analysis involved a sample of 50 participants for each subject. To make sure that there were no breaches of the assumption of normality, preliminary checks were carried out. This is presented in appendix C. Table 12 presents the analysis.

Table 13: Relationship Between TAL and students' Academic Achievement

Subject	Variable	r	df	p-value
English Language	Teachers' Assessment Literacy (1) Students' Academic Achievement (2)	.408	50	.278
Mathematics	Teachers' Assessment Literacy (1) Students' Academic Achievement (2)	.294	50	.265
Science	Teachers' Assessment Literacy (1) Students' Academic Achievement (2)	.567	50	.355

Source: Field Survey (2022)

For English Language, a moderate positive correlation was observed between teachers' assessment literacy and students' academic achievement, with a Pearson's r of 0.408 (p = 0.278). In Mathematics, a similar positive

correlation was found, though weaker, with a Pearson's r of 0.294 (p = 0.265). In contrast, for science, a stronger positive correlation was identified, with a Pearson's r of 0.567 (p = 0.355).

Research hypothesis 5 to 7:

$5H_0$: There is no significant relation between English language teachers' assessment practices and students' academic achievement in English Language.

$6H_0$: There is no significant relationship between Mathematics teachers' assessment practices and students' academic achievement in Mathematics.

$7H_0$: There is no significant relationship between Science teachers' assessment practices and students' academic achievement in Science.

The aim of research hypothesis 5, 6 and 7 were to investigate the relationship between EMS teachers' classroom assessment practices and students' academic achievement in English language, Mathematics and Science. Mean scores of each school under the 50 GALOP school in the study were obtained from the students' academic achievement raw score (20,79) in English language, mathematics and Science to serve a representative sample for purposes of the correlation test. Pearson's correlation coefficients were computed. The analysis involved a sample of 50 participants for each subject. To make sure that there were no breaches of the assumption of normality, preliminary checks were carried out. This is presented in appendix C. Table 14 presents the analysis.

Table 14: Relationship between CAP and Student Academic Achievement

Subject	Variable	r	df	p-value
English Language	Teachers' Assessment Practices (1) Students' Academic Achievement (2)	.457	50	.467
Mathematics	Teachers' Assessment Practices (1) Students' Academic Achievement (2)	.292	50	.189
Science	Teachers' Assessment Practices (1) Students' Academic Achievement (2)	.512	50	.320

Source: Field Survey (2022)

In English Language there was a moderate positive correlation between teachers' assessment practices and students' academic achievement, as indicated by a Pearson's r of 0.457 (p = 0.467). In Mathematics, a weaker positive correlation was observed with a Pearson's r of 0.292, though the result was not statistically significant (p = 0.189). In the case of science, a strong positive correlation was identified with a Pearson's r of 0.512, but the correlation was not statistically significant (p = 0.320).

Discussion of Results

The Discussion section of this thesis aims to interpret and analyze the research findings in the context of the study's objectives and research questions. This section seeks to shed light on the implications of the results and their significance in addressing the research problem. By critically examining the outcomes, this discussion will provide deeper insights into the

relationships and patterns observed, as well as explore potential explanations for the findings.

Teachers' Assessment Literacy in The Sagnarigu Municipality

The present study provides valuable insights into the classroom assessment literacy of junior high school teachers in the Sagnarigu Municipality of Ghana. The primary research question aimed to assess the proficiency of teachers in terms of their assessment knowledge. The findings revealed that 74 out of 150 respondents (49.3%) demonstrated a high level of assessment knowledge. These results are in line with a study conducted by Alkharusi et al (2012) in Oman, where educators believed they possessed adequate skills in educational assessments.

Similarly, Sathasivam and Daniel (2011) reported a high level of assessment competence among Malaysian primary science teachers. However, it was observed that a behaviorist approach was more common, and teachers exhibited limited understanding of formative assessment techniques. This lack of comprehension of formative assessment could potentially impact their adherence to assessment standards and their students' comprehension of scientific concepts.

In contrast to previous research by Amedahe (1989) in Ghana's Central Region, which indicated a deficiency in appropriate assessment skills among secondary school teachers, the current study suggests that junior high school teachers in the Sagnarigu Municipality may not be as proficient in assessment practices as expected. Another study involving junior high school educators in Ghana also revealed insufficient skills in managing assessment practices (Curriculum, Research & Development Division [CRDD] of Ghana Education

Service, 1999). Furthermore, Kiomrs et al. (2011) found that secondary school instructors in Iran had limited expertise in language assessments.

It is crucial to consider that differences in findings between this study and previous research may be attributed to various factors, including the time period of the studies, the characteristics of the respondents, and the training methods provided to the teachers. Over time, educational practices and policies may have evolved, leading to changes in teachers' assessment knowledge and practices.

The results of this study emphasize the necessity for continuous professional development opportunities for teachers to enhance their classroom assessment literacy. By offering targeted training and support, educators can further develop their assessment skills, particularly in implementing formative assessment techniques that foster student learning and understanding. Additionally, incorporating a more comprehensive approach to assessment in teacher training programs could ensure that future educators are well-equipped with the necessary skills to conduct effective classroom assessments.

The findings of this study contribute to the understanding of assessment literacy among junior high school teachers in the Sagnarigu Municipality. Although a significant proportion of teachers demonstrated a high level of assessment knowledge, there is still room for improvement. As education continues to evolve, it is crucial to equip teachers with the knowledge and tools they need to implement effective assessment practices that support student learning and achievement. Future research in this area could delve deeper into the specific areas where teachers may require

additional support and explore the impact of enhanced classroom assessment literacy on student outcomes.

Classroom assessment Practices of Teachers' in The Sagnarigu Municipality

The findings of the study shed light on the diverse classroom assessment practices employed by junior high school teachers in the Sagnarigu Municipality. The results indicated that teachers utilized a variety of assessment techniques to gather accurate data from their students. Some of the commonly used assessment methods included essay questions, multiple-choice questions, class exercises immediately following instruction, oral questions to gauge students' understanding, and end-of-term exams to measure students' progress.

The study's outcomes were consistent with previous research by Benzehaf (2017), which found that instructors employed a range of assessment methods, particularly for summative assessment, such as home assignments and in-class written assessments. However, it was interesting to note that teachers in the present study reported evaluating students more frequently than what was observed in Benzehaf's study. This difference may be attributed to the context and educational system of the Sagnarigu Municipality compared to the setting of Benzehaf's research.

Moreover, the findings aligned with the assertions of Gronlund (2006) that teachers use a multitude of assessment techniques in their daily classroom assessments. These methods encompass both traditional exams, such as multiple-choice and true or false questions, as well as alternative assessments like portfolios, student self-assessment, and performance-based examinations.

This diversity in assessment practices reflects a well-rounded approach to evaluating students' learning and understanding.

However, the study's results differed from Sofo, Ocansey, Nabie and Asola's (2013) research, which highlighted the prevalence of oral reporting, peer observation, demonstration, skill testing, and observation as the dominant assessment practices in practical classes. This discrepancy may be attributed to variations in the subjects taught and the specific focus of the assessments conducted by the teachers in different contexts.

Regarding test construction practices, the study revealed that most teachers carefully considered the objective of the test before creating test items. This practice is essential to ensure that the assessment aligns with the intended learning outcomes and accurately measures the desired attributes. It was also encouraging to note that teachers promptly developed marking systems after creating test items, indicating a thoughtful approach to planning and assessing students' responses.

However, a notable area for improvement was the use of test specification tables, as a significant number of respondents did not employ this tool while creating test items. Test specification tables can provide a structured framework for test design, ensuring that the test items accurately assess the targeted learning objectives.

Regarding test administration practices, the study's findings demonstrated that the majority of junior high school teachers in the Sagnarigu Municipality exhibited excellent administration abilities. This aligns with the research by Rukundo and Magambo (2010), emphasizing the importance of providing students with an equal opportunity to demonstrate their

achievements while maintaining a conducive testing environment. The study's results also underscored the significance of fair and competent test administrators, consistent with the assertions of Cottrell (2001). Effective test administration is essential to ensure that assessments yield accurate and reliable results, free from biases or external factors that may influence student performance.

In terms of grading practices, the study found that many teachers considered academic facilitators, such as effort and improvement, in addition to academic performance when assigning grades. This holistic approach to grading aligns with the research by (McMillan, 2008; Zoeckler, 2007), emphasizing the importance of considering both performance and non-performance factors to provide a comprehensive evaluation of students' work.

Overall, the findings of this study highlight the varied and multi-faceted classroom assessment practices employed by junior high school teachers in the Sagnarigu Municipality. The results suggest that teachers have a strong commitment to evaluating their students' learning and understanding through diverse assessment techniques. However, there are areas for improvement, such as incorporating test specification tables during test construction and emphasizing the use of formative assessment practices.

It is crucial for educators and educational policymakers to recognize the importance of continuous professional development for teachers in the domain of assessment literacy. By providing targeted training and support, teachers can enhance their assessment skills and foster a deeper understanding of formative assessment techniques, leading to improved student learning outcomes.

Future research could delve further into specific factors influencing teachers' assessment practices, such as the availability of resources and support, the impact of educational policies on assessment practices, and the relationship between assessment practices and students' academic achievements. Understanding these factors could contribute to the development of effective strategies to enhance classroom assessment practices and promote student success in the Sagnarigu Municipality and beyond.

Relationship Between TAL and CAP's

The statistical analysis reveals a significant positive correlation ($r = 0.708$, $p = 0.035$) between Teachers' Assessment Literacy and Classroom Assessment Practices. This empirical finding aligns with existing research in the field, contributing to the growing literature that underscores the pivotal role of educators' assessment literacy in shaping the quality of assessments implemented within the classroom context (Popham, 2010)

Assessment literacy serves as the bedrock of effective teaching practices, encompassing educators' understanding of assessment principles and methodologies (Mertler, 2003; Alkharusi et al., 2012). The strong positive correlation observed in the present analysis echoes the sentiments of (Ara and Saeed, 2020) highlighting a positive strong relationship between assessment literacy and classroom assessment practices.

The statistical significance ($p = 0.035$) further substantiates the empirical link between assessment literacy and classroom practices. This aligns with the call for targeted professional development in assessment literacy. Popham (2010) argues that effective translation of assessment

knowledge into classroom practices necessitates ongoing professional development initiatives tailored to the specific challenges faced by educators.

While the present study establishes a strong correlation, it is imperative to acknowledge the nature of this relationship. Correlation does not imply causation (Gershman & Ullman, 2023). And further research is warranted to elucidate the mechanisms through which enhanced assessment literacy translates into improved classroom assessment practices. Future studies should explore potential mediating factors and the longitudinal impact of targeted interventions aimed at improving educators' assessment literacy on student academic achievement.

In conclusion, the empirical findings substantiate the theoretical assertions within the literature, highlighting a significant positive correlation between Teachers' Assessment Literacy and Classroom Assessment Practices. The implications extend beyond statistical associations, emphasizing the need for continuous professional development initiatives tailored to fortify educators' assessment literacy and, subsequently, enhance the quality of classroom assessments.

Relationship Between TAL and Students' Academic achievement.

This study investigated the relationship between teachers' assessment literacy and students' academic achievement in English Language, Mathematics, and Science. Employing Pearson's correlation coefficients, the analysis revealed varying degrees of association across subjects, offering important insights into the relationship between assessment practices and student academic achievement.

For English Language, a moderate positive correlation (r = 0.408, p = 0.278) was identified, suggesting that higher teacher assessment literacy in English was associated with slightly higher student achievement in the subject. This aligns partially with studies by (Ara and Saeed, 2020) highlighting the positive strong relationship between assessment literacy and students' academic achievement. However, the marginal statistical significance necessitates cautious interpretation.

With regards to Mathematics, a weaker positive correlation (r = 0.294, p = 0.265) emerged, implying a less pronounced association between teacher assessment literacy and student achievement in this domain. This finding warrants further exploration of potential subject-specific factors influencing this relationship. For instance, the nature of assessment techniques employed in Mathematics might differ from those in English, leading to varied impacts on student academic achievement.

The strongest positive correlation (r = 0.567, p = 0.355) was found in science, suggesting a moderately positive association between teachers' assessment literacy and student academic achievement. This aligns with Mellati and Khademi (2018) emphasize the crucial role of formative assessment in science education. Effective assessment practices can foster deeper understanding, improved problem-solving skills, and ultimately, higher achievement in scientific concepts (Popham, 2009a).

These results underscore the importance of promoting assessment literacy among teachers to enhance the quality of classroom assessment practices. By improving teachers' knowledge and understanding of assessment

techniques and principles, educators can create more accurate and meaningful assessments that contribute to students' learning and academic achievement.

Based on these findings, educational institutions and policymakers can design targeted professional development programs to enhance teachers' assessment literacy. Empowering teachers with effective assessment strategies and tools can lead to better instructional practices and ultimately improve student outcomes

Relationship Between CAP and Students' Academic Achievement.

This study explored the relationship between teachers' assessment practices and students' academic achievement in English Language, Mathematics, and Science. Employing Pearson's correlation coefficients, the analysis revealed intriguing variations in the strength and significance of these relationships of the variables across subjects, necessitating deeper examination.

English Language: A moderate positive correlation ($r = 0.457$, $p = 0.467$) emerged, suggesting that moderately stronger teacher assessment practices in English were associated with slightly higher student achievement in the subject. This aligns with Schneider and Preckel (2017), highlighting the positive impact of effective assessment practices on learning outcomes. However, the non-significant p-value indicates a need for caution in interpreting the observed relationship.

On students' Mathematics scores, A weak, non-significant positive correlation ($r = 0.292$, $p = 0.189$) was identified. This finding raises questions about the specific types of assessment practices utilized in Math compared to English and their varying impacts on student academic achievement. Subject-

specific assessment strategies might play a crucial role (Francisco and Celon, 2020)

For students' scores on science, a strong positive correlation (r = 0.512) was observed, reflecting a potentially moderately strong association between robust teacher assessment practices and student achievement in science. This aligns with the (Hayati, et al 2020) whose results showed that classroom assessment practices have a relationship to students' academic achievement. However, the observed differences in students' performance were statistically not significant. This could be due to the influence of student and school environment-related factors which were not included in this study

The observed differences in correlations across subjects warrant further exploration. Potential contributing factors could include, Subject-specific assessment practices. Assessment approaches may differ significantly between subjects, impacting their influence on student learning. For instance, Math might rely heavily on standardized tests, while Science might benefit more from frequent formative assessments.

Also, Variations in teacher expertise such that, teachers' specialized knowledge and pedagogical skills in each subject could influence their assessment practices and their effectiveness (Stiggins, 2005).

It is crucial to acknowledge the limitations of this study. The sample size (50 participants per subject) might limit generalizability, and additional research with larger and more diverse samples is needed to confirm and further explore these findings. Additionally, the study focused on a correlational analysis, which cannot establish causality. To understand the precise mechanisms by which teacher assessment literacy impacts student

achievement, future research employing experimental or quasi-experimental designs would be valuable.

Chapter Summary

The study revealed that a considerable number of teachers in the Sagnarigu Municipality possessed a strong understanding of assessment principles and practices. Their assessment practices showed a thoughtful and purposeful approach to gathering information about students' learning outcomes however, majority of the teachers do not use Table of specification during item construction. The positive relationship between assessment literacy and classroom assessment practices underscores the importance of enhancing teachers' assessment knowledge and skills to improve the quality of education in the region.

Furthermore, teachers who understand assessment better tend to have students who score higher across all subjects, with the strongest relationship in Science and the weakest in Math. This might be because Science uses more varied hands-on assessments, while English could benefit from more self-assessment and targeted feedback. Math's connection needs further study, as existing practices might play a role. To boost achievement, tailor training to each subject's assessment needs and encourage teachers to share best practices across disciplines. since, correlation does not equal causation, and other factors like motivation and classroom environment can also affect results.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

The research goal was to learn more about Sagnarigu Municipality Junior High Schools' professional teachers' assessment literacy, classroom assessment practices and their students' academic achievement. The investigation specifically looked for the relationship between teachers' assessment literacy, classroom assessment practices, and academic achievement of their pupils. In this section, the study's main results, inferences, and suggestions were summarised. Additionally, the study's commitment to knowledge, counselling implications, and ideas for future research have all been included.

Overview of the Study

The study examined the relationship between professional teachers' assessment literacy, classroom assessment practises, and the academic achievement of their pupils in the public junior high schools of the Sagnarigu Municipality.

The investigation was motivated by six objectives, which were expressed as three hypotheses and three research questions. The investigation was conducted using descriptive survey method, precisely cross-sectional methodology. The population for this investigation consisted of all 1,257 public junior high school teachers and all final year students in Sagnarigu Municipality. The study, however, targeted 150 mathematics, integrated science, and English language teachers (EMS) and 2097 form three students'

at GALOP junior high schools. Using purposive sampling technique, all 150 EMS teachers and 2097 students participated in the investigation.

A questionnaire containing scales developed by other researchers was adapted, modified, and utilised for the study. These are the teacher assessment literacy questionnaire, classroom assessment practises questionnaire. The study also employed students raw score of the district mock examination conducted by the Sagnarigu district municipal directrate. Internal consistency was as follows in the final version of the questionnaire: assessment literacy questionnaire, KR20 =.77; classroom assessment practises questionnaire, = .78 to .88. The collected data were analysed using descriptive and inferential statistics (frequency, percentage, and mean). A Pearson structural correlation was used.

Key Findings

The study focused on exploring the relationship between teachers' assessment literacy, teachers' classroom assessment practices and students' academic achievement of public junior high school professional teachers in the Sagnarigu Municipality, located in the northern part of Ghana. The key findings of the study can be summarized as follows:

1. The analysis of assessment literacy levels in the study reveals a noteworthy distribution, with 49.33% exhibiting high assessment literacy (21-30), 26.6% demonstrating a moderate level (11-20), and 24.0% falling within the low assessment literacy range (0-10).
2. In the realm of classroom assessment practices among JHS EMS professional teachers, the research reveals that a considerable 70.0% frequently use oral questions for in-class assessment, and 67.3% assign

homework for assessment. However, the majority (76.0%) tend to copy exam questions from books, majority of teachers did not also use the table of specifications when constructing test items. of item construction suggesting a potential area for improvement in creating original test items.

3. The research reveals a concerning trend: across English, Mathematics, and Science, the majority of students fall below average, highlighting the need for targeted interventions to improve overall academic achievement. While Science shows a slightly more balanced distribution, English and Mathematics present a significant gap within the "Below Average" category.
4. The outcome of the research reveals a strong, positive, and statistically significant correlation between teachers' Assessment literacy and their Assessment practices ($r = 0.708$, $p < 0.001$).
5. The study found a statistically significant and positive relationship between teachers' assessment literacy and students' academic achievement in English Language, Mathematics, and Science. With Pearson's correlation coefficients ranging from 0.294 to 0.567 and p-values below 0.01, the results suggest a moderate to strong correlation.
6. The analysis reveals a significant and positive correlation between teachers' assessment practices and students' academic achievement in English Language ($r = 0.457$), Mathematics ($r = 0.292$), and Science ($r = 0.512$), supported by p-values below 0.01.

Conclusions

In conclusion, the research findings contribute insights to the discourse on assessment literacy, classroom practices, and their implications on student academic achievement. The distribution analysis of assessment literacy levels highlights a notable distribution, emphasizing the imperative for targeted professional development initiatives to address varying proficiency levels. The examination of classroom assessment practices among JHS EMS professional teachers reveals a prevalent use of traditional methods such as oral questions and homework, alongside a noteworthy reliance on copying exam questions from books, indicating a crucial need for interventions to foster original item creation and utilization of assessment frameworks.

Moreover, the research underscores a concerning trend in students' academic achievement, particularly in English and Mathematics, necessitating urgent and tailored interventions. The strong correlation between teachers' assessment literacy and practices affirms the symbiotic relationship between educators' proficiency and their applied methodologies. Furthermore, the statistically significant and positive relationship between teachers' assessment literacy and students' academic achievement, as indicated by Pearson's correlation coefficients, underscores the pivotal role of effective assessment practices in influencing student outcomes.

In essence, the research findings provide a comprehensive foundation for informed interventions, emphasizing the urgency of targeted professional development, innovative assessment practices, and tailored strategies to enhance overall academic achievement. The research offers a scholarly

contribution to the field, emphasizing the interconnectedness of assessment literacy, classroom practices, and student success in the educational landscape.

Recommendations

To further enhance classroom assessment practices and promote student learning, the following recommendations are proposed:

Professional Development: Education authorities and institutions should prioritize providing ongoing professional development opportunities for teachers in the Sagnarigu Municipality. These training sessions should focus on enhancing assessment literacy, including understanding different assessment methods, aligning assessments with learning objectives, and effective test construction and administration.

Formative Assessment Training: Teachers should be encouraged to deepen their understanding of formative assessment techniques. Formative assessment plays a crucial role in supporting student learning and guiding instructional decisions. Teachers should be equipped with strategies to implement formative assessment effectively in their classrooms.

Assessment Alignment: It is essential for teachers to consistently align their assessment practices with instructional goals. Education policymakers should encourage the use of assessment specification tables to ensure that assessment items accurately reflect the intended learning outcomes.

Feedback and Reflection: Teachers should be encouraged to provide timely and constructive feedback to students on their assessments. Additionally, teachers should engage in regular reflection on their assessment practices to identify areas for improvement and refine their approaches to assessment.

Collaboration and Sharing of Best Practices: Teachers should be encouraged to collaborate with colleagues and share best practices related to assessment. Collaborative efforts can lead to the development of innovative assessment methods and foster a culture of continuous improvement in assessment practices.

Assessment Policy Review: Education authorities should periodically review and update assessment policies to align them with best practices and current educational research. Clear and well-defined assessment policies can provide guidance and support for teachers in their assessment practices.

By implementing these recommendations, the Sagnarigu Municipality can create a conducive environment for effective classroom assessment practices, leading to improved student learning outcomes and overall educational quality. The positive relationship between assessment literacy and classroom assessment practices emphasizes the importance of continuous efforts to enhance teachers' assessment knowledge and skills, ultimately benefiting students and the entire educational community.

Suggestions for Further Studies

1. It is advised that future researchers use a qualitative, mixed-methods research strategy to study the same research question.
2. For further study, it is advised that they look at the effect of current teachers' assessment literacy on that of aspiring teachers.
3. In a similar vein, it's crucial to determine whether or not a teacher's classroom experience aids in the development of assessment knowledge and abilities. And does the teacher's field of study (social

science or natural science) have any bearing on the literacy of the classroom assessment?

4. It is also advised that future studies use a bigger sample size to corroborate the results of this study.

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APPENDICES

APPENDIX A: QUESTIONNAIRE FOR TEACHERS

This questionnaire gathers data on the assessment literacy and classroom assessment practises of professional teachers. The data you supply will be kept private since this is only an academic activity. Please be aware that your participation in this research is voluntary, and you are free to end it whenever you see fit. To the best of your knowledge, kindly answer. Section B: teachers classroom assessment literacy and section C: teachers classroom assessment practices to the best of your ability, please respond to each of the following assertions.

Instructions: To indicate your response, kindly mark [√] or write it in the relevant field.

SECTION A: BACKGROUND INFORMATION

1. **Gender**

   a. Female [ ]

   b. Male [ ]

2. **Age**

   a. 20 years & below [ ]

   b. 21 – 30 years [ ]

   c. 31 – 40 years [ ]

   d. 41 – 50 years [ ]

   e. 51 – 60 years [ ]

   f. Above 60 years [ ]

3. Professional Qualification

   a. Diploma in Education [ ]

   b. Bachelor of Education [ ]

   c. Master of Education (M.Ed) [ ]

   d. M.Phil in Education [ ]

4. Number of years you have been teaching

a. 0 – 3 Years [ ]

b. 4 – 7 Years [ ]

c. 8 – 11 Years [ ]

d. 12 years and above [ ]

SECTION B: ASSESSMENT LITERACY

In the best way you can, please let me know what you think about each of the following statements.

Statement	True	False
Planning and Construction of Classroom Assessment		
1. It is recommended that you consider the ease of creating the assessment into account when selecting an assessment technique.		
2. After creating the exam items, a teacher must create a marking guide.		
3. Giving pupils a problem-solving exercise is the most efficient approach to evaluate the reasoning they used to reach a decision.		
4. Tests need to be written by the teacher to be understandable by both high and poor achievers.		
5. Using multiple-choice assessments is the most efficient method for a teacher to gauge their students' aptitude for putting things together, arranging them, and combining them to form patterns.		
6. The test's reliability is improved by including additional items.		
7. It is preferable to design questions that require students to define, recollect, and restate in order to measure students' ability to organise ideas rather than merely repeating facts.		
8. Compared to multiple-choice questions, essay exam grading is more objective.		

9. Information on students' scores in a quiz/class test can be used to modify instruction better than students' scores in the end of term examination.		
10. Multiple assessments should be used by teachers to gauge how much their pupils have learned.		
11. Test should be administered to students at any time, even without their prior notice		
Administration, Scoring and Use of Assessment Results		
12. When test results correctly represent the material that was taught, they are considered to be reliable.		
13. It is possible to change teaching more effectively with data on students' performance on quizzes or in-class exams than it is using data on their performance on final exam results.		
14. Students should be given tests at any time, even when they are not informed in advance.		
15. Students should be given a lot of time while being tested.		
16. Testing should be conducted in well-ventilated, well-lit spaces.		
17. The marking rubric should be properly followed while scoring tests.		
18. If the average score of students in a class is 65, Kweku, who had a score of 80, could be referred to as performing excellently		
19. Ama is a good student because she does better than more than half of the other students in her class.		
19. It is important to compare a student's performance to that of their classmates if a teacher wishes to gauge how much they have learned a certain subject.		
21. Teachers should prioritise an achievement on multiple tests while grading them.		
22. Teachers should comment on students' assessments.		

Ethical and Legal Issues in Assessment.		
23. It is better to evaluate pupils using test samples from textbooks if a tutor wishes to know whether or not students have mastered certain educational goals.		
24. When exam questions are chosen from previously asked questions or textbooks that have been published, it is better to evaluate pupils.		
25. Assessment methods should be devoid of prejudice and preconceptions based on gender, ethnicity, socioeconomic status, and religion.		
26. Teachers should be particularly harsh with students who skip class and generous with those who attend regularly while grading their exams.		
27. Without the student's permission, teachers shouldn't share their comments on their assessments with anyone else.		
28. Teachers should be in charge of preserving students' right to privacy and maintaining the confidentiality of their assessment findings.		
29. Before utilising copyright materials in assessment, teachers are not required to get permission.		
30. Instead of using a single evaluation as a tool for punishing or restraining students' behaviour, teachers should consider students' performance in light of the learning goals covered in class.		

SECTION C: CLASSROOM ASSESSMENT PRACTICE

Teachers Assessment Modes and Formats

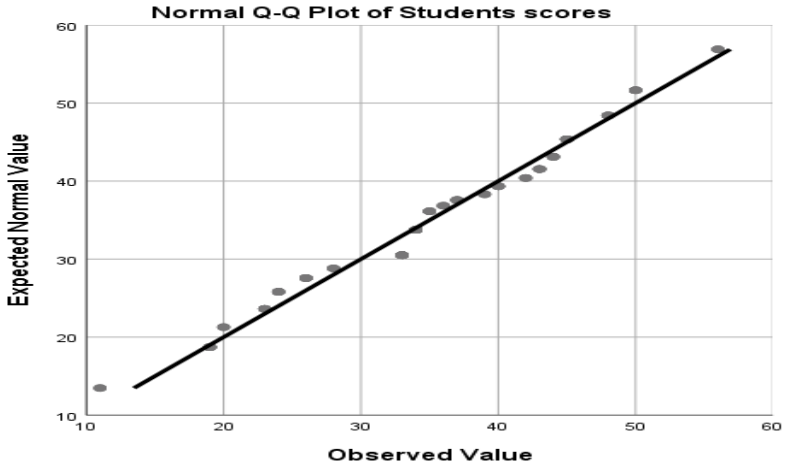
Note: Tick [] the following actions that pertain to your practise with classroom assessments to indicate your degree of practise.

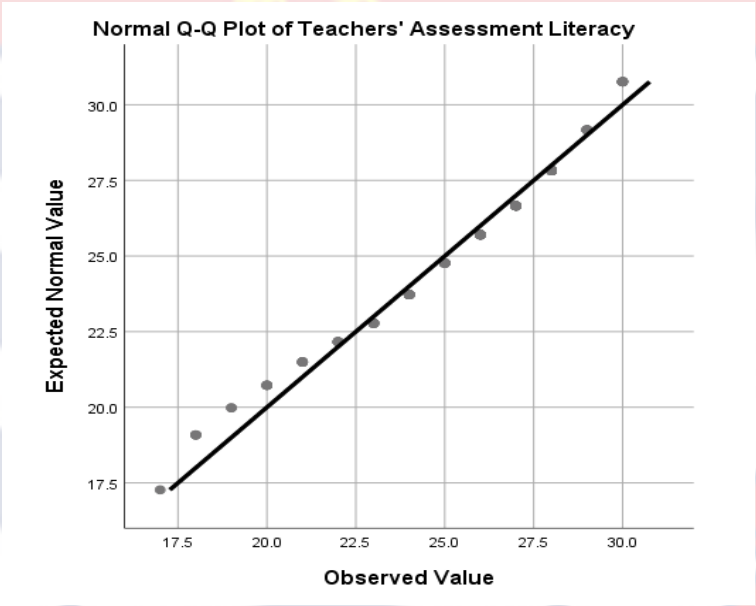
Where: 1 = *Not used(N), 2 = Often (O), 3 = More often(M)*

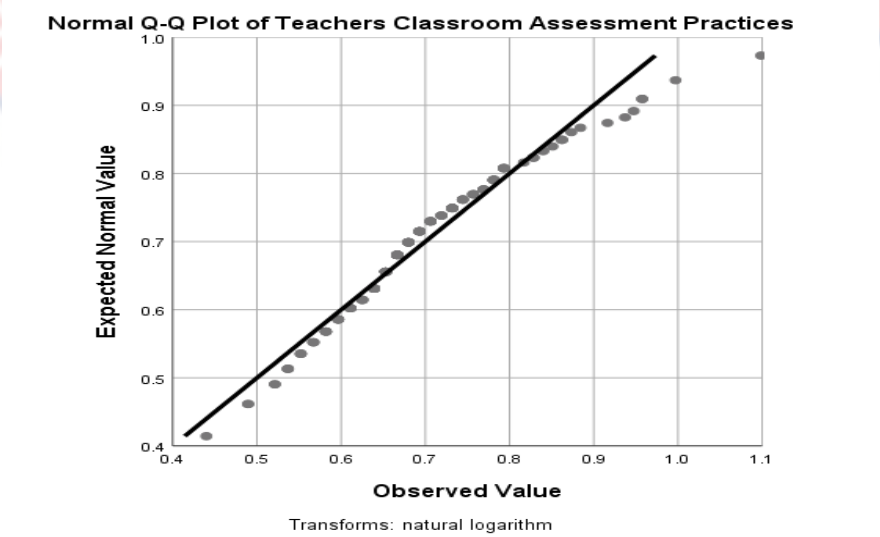
S #	Statements	More often	often	Not often	Not used
	(a) Teacher assessment mode and format				
1.	After teaching, I immediately offer my pupils tests to gauge their progress.				
2.	I assign homework for assessment.				
3.	During class times, I assess my pupils by asking them oral questions.				
4.	At the end of the term, I administer tests to evaluate my pupils.				
5.	I use essay questions to evaluate my pupils.				
6.	I construct multiple-choice items to assess my students				
7.	I use true/false items to assess my students				
	(b) Teachers test construction practices				
8.	Two weeks before the exam date, I compose each individual test item.				
9	As soon as my items are constructed, I create a marking system.				
10	I made copies of questions from previous BECE test questions.				
11	I develop test items only when it is time to assess students.				
12	While creating test items, I use a test specification table				
13	I copy test questions from textbooks.				
14	I match test items with instructional goals.				
15	I base the items I create on knowledge that pupils already acquire.				
16	I arrange objective test answers in a pattern to make scoring easy				
17	When creating test items, I take into account the test's objective.				
18	Teachers at my school get in-service training in test construction.				
19	I prepare more items than needed before I review and select some for the test.				
20	Before creating the final copy, I examine the test as a whole.				

	(c) Test administration and scoring practice				
21	I ensure good seating arrangements to prevent students from copying each other.				
22	I warn pupils that they must write quickly on exams or they will fail.				
23	I anticipate and plan for emergencies during exams.				
24	I provide guidance to students who inquire about specific test items during exams.				
25	I read novels, newspapers or WhatsApp friends when I invigilate tests/examinations				
26	I provide students with prior notice of the subjects and content covered in exams and assessments.				
Teachers test Scoring Practices					
27	I score essay tests, question by question.				
28	When students have taken the exam, I create marking schemes for essay questions.				
29	To make sure that my grading is consistent, I regularly rescore previously graded papers.				
30	I score answer scripts with the names of the students known to me.				
31	While scoring the remaining items, I hide the items that have already been scored.				
32	The first few essays I score influence the rest of the scores I give.				
33	When grading essays, I provide a separate score for writing mechanics including proper grammar, expression flow, etc.				
	(e) Grading practices of teachers				
34	The grade that I assigned to students' work communicates academic performance only.				
35	I assign grades purposely to punish non-learning students.				
36	I assign grades to motivate all students to learn harder				
37	I use a standard base grading system for my school in grading.				
38	My grading is influenced by a student's behaviour, including attitude, effort, and behaviour.				

APPENDIX B: NORMALITY TEST







APPENDIX C: INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS
DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Telephone: 0332091697
Email: dep@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref:

Your Ref:

10th June, 2022

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

THESIS WORK
LETTER OF INTRODUCTION
MR. ALHASSAN ABDUL RAZAK

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

Mr. Razak, is researching on the topic:

"RELATIONSHIP AMONG JUNIOR HIGH SCHOOL TEACHERS' ASSESSMENT LITERACY, CLASSROOM ASSESSMENT PRACTICE AND STUDENT ACADEMIC ACHIEVEMENT."

We would be most grateful if you could provide him the opportunity and assistance to collect data for the study. Any information provided would be treated strictly as confidential.

We sincerely appreciate your co-operation and assistance in this direction.

Thank you.

Yours faithfully,

Daniel Hagan (Mr.)
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: CESERB/ucc.edu/VE-122
Your Ref: .....
Date: 11th October, 2022

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY

The bearer, Razak A. Alhassan, Reg. No. EFMEP/25/0011 is a 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:

Investing the relationship among teachers' assessment literacy, classroom assessment practice and students' academic achievement

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 him/~~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. Omotosho
0243784739

Vice-Chairman, CES-ERB
Prof. K. Edjah
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Secretary, CES-ERB
Prof. Linda Dzama Forde
lforde@ucc.edu.gh
0244786580

APPENDIX E: ENGLISH, SCIENCE AND MATHEMATICS

DISTRICT MOCK EXAMINATION

ENGLISH LANGUAGE 2 [1 hour 10 Minutes]
This paper consists of three parts: A, B and C. Answer three questions in all; one question from Part A and all the questions in Part B and Part C.

PART A
ESSAY WRITING
[30 MARKS]

Answer one question only from this part
Your composition should be about 250 words long.
Credit will be given for clarity of expression and orderly presentation of material.

1. Your class teacher has punished you for something you did not do. Write a letter to your headmaster or headmistress explaining why you think you have been punished unfairly.
2. Write an article to be published in a national newspaper on why every school should have a library.
3. Write arguments for or against the topic: It is more advantageous to live in the village than in the city.

PART B
COMPREHENSION [30 marks]

4. Read the following passage carefully and answer all the questions which follow

The dry season was very long. The people waited anxiously for the rains to plant their seeds. The rain clouds that appeared occasionally were deceptive. To while away the time, they wove baskets and kente; others carved stools or sat under trees, playing games and drinking palm wine.

Sentu and his family were on the verge of starvation. They had just one cassava farm left to feed on. The maize in the barn was all gone. In fact, they had started eating the seed maize. Sentu kept wondering how he would get seeds to plant when the rainy season eventually started. He went to inspect the traps he had set for the rodents that had been feasting on the cassava. If the traps caught any animals, it would be a double blessing; he would get meat and reduce the population of 'his enemies', the pests. While inspecting his traps, he saw some smoke. He dashed towards it. He tried to put out the fire but could not. He shouted for help. In a twinkling of an eye, the whole farm had been destroyed. Sentu wept uncontrollably.

When he reached the village, his neighbours rushed to his house to console him. They gave him foodstuff and promised to help him get back on his feet.

Tutu, the palm-wine tapper, visited Sentu that evening. He was accompanied by two elderly and highly respected men in the village. Their task was simple. Tutu had asked them to apologise to Sentu on his behalf. It was the fire from Tutu's torch that had caused the havoc and brought such agony to Sentu's family. What could Sentu do or say?

(a) (i) What was the main occupation of the people?
(ii) State two other things they did that could earn them an income.

(b) (i) What does 'pests' refer to?
(ii) Why did the writer refer to the pests as 'his enemies'?

(c) (i) How did Sentu feel when his farm was burnt? (ii) Why did he feel that way?

(d) For what two reasons did Tutu choose the elderly and highly respected men to accompany him to visit Sentu?

(e) Explain the following expressions in your own words.
(i) a double blessing
(ii) wept uncontrollably
(iii) get back on his feet

(f) For each of the following words, give another word or phrase that means the same, and can fit into the passage: (i) anxiously;
(ii) deceptive;
(iii) dashed;
(iv) mission; (v) agony.

PART C
LITERATURE
[10 MARKS]
Answer all the questions in this part

SACKEY J.A and DARMANI L. (COMP): The Cockcrow

5. Questions 5(a) to 5(c) are based on the abridged and simplified version of Charles Dickens' Oliver Twist.

CHARLES DICKENS: Oliver Twist

"Stop your tears, Boy", cried the Chairman, "you must pray and thank God that the good people of the church feed you."

(Page 103)

(a) "Boy" refers to ……
(b) The boy was crying because ……
(c) Where was the boy taken to after the meeting?

Read the following extract carefully and answer Questions 5(d) and 5(e).

PETER P. ADOLINAMA : Ripples

"Even before the man who was chosen to talk opened his mouth, the family of Amina were casting accusing glances at Safia …. Safia knew she was not responsible for Amina's death but she was nervous as a new bride."
(Pages 82 - 83) (d) Safia was suspected to be responsible for Amina's death because…..

(e) What was the real cause of Amina's death?

Read the following extract carefully and answer Question 5(f) and 5(g).

AMA ATA AIDOO: The Dilemma of a Ghost

Nana: I notice you do not feel clear in your own inside….Have we not had enough of the white man's medicine? Since they do not seem to do anything for your wife, why do you not take her to Kofikrom? The herbalist there is famous.

(Page 30 - 31)

(f) Whose wife is referred to in the extract?
(g) What answer does the one being addressed give Nana?

Read the extract below carefully and answer Questions 5(h) and 5(i).

A.A. AMOAKO: Sleep without Wake

"Mother's milk gave me suck
Mother's fingers soothed my skin
The night kept mother awake
When baby was sour
And that was me!"

(Page 156)

(h) The image of "Mother" in the extract is that of a/an ……mother.
(i) The literary device used in "The night kept Mother awake" is …….

ENGLISH LANGUAGE 1

Objective Test [35 Minutes]

Answer all questions. Each question is followed four options lettered A to D. Find out the correct option for each question and shade in pencil on your answer sheet the answer space which bears the letter as the option you have chosen. Give to one answer to each question.

PART A

Lexis and Structure

SECTION A

From the alternatives lettered A to D, choose the one which most suitably completes each sentence.

1. You'll travel by train to Kumasi, ...?
   A. won't you
   B. can't you
   C. shouldn't you
   D. wouldn't you
2. We worked hard in our final year, …….?
   A. did we
   B. isn't it
   C. aren't we
   D. didn't we
3. If Mary had known she wouldn't have come,….?
   A. wasn't it
   B. hadn't she
   C. did she
   D. would she
4. None of the suspects …….his guilt.
   A. admit
   B. admits
   C. are admitting
   D. have admitted
5. ..... hearing the news, he jumped high for joy.
   A. over B. on
   C. with
   D. in
6. The book you gave me was not .....than the one I had before. A. any better
   B. much better
   C. any good
   D. very better
7. I saw him while he ……the cloth.
   A. is folding
   B. has been folding
   C. was folding
   D. had been folding

8. The kind woman gave ……a box of sweets.
   A. all and each one
   B. all and everyone
   C. each and all
   D. each and everyone
9. Can you make .....Issaka in the crowd?
   A. of
   B. up
   C. out
   D. away
10. You don't believe that, ……?
   A. isn't it
   B. do you
   C. won't you
   D. don't you
11. The teacher told the girl he had received ……of the two exercises.
   A. all
   B. any
   C. none
   D. neither
12. My father has bought a ……..car
   A. private brand new B. new brand private C. private new brand
   D. brand new private
13. Atsu is looking forward to …….his friends at the party.
   A. see
   B. be seeing
   C. seeing
   D. have seen

14. If Kofi had studied hard, he ….. his examination.
   A. would pass
   B. would be passing
   C. will be passing
   D. would have passed
15. Children usually take ..... their parents in appearance. A. after
   B. from
   C. to
   D. up

SECTION B

Choose from the alternatives lettered A to E the one which is nearest in meaning to the underlined word in each sentence.

16. Mr. Mensah was worn out after walking up A. saved the hill. B. reared
A. tired C. born
B. sweating D. taught
C. hungry 19. Prices of goods have been fairly controlled.
D. worried A. kept down

17. Your dress material is inferior to what I B. kept hanging bought from the shop. This means that your C. kept away
dress material is ..... D. kept out
A. brightly coloured 20. Kofi spent all his time staring at the madman.
B. very beautiful A. gazing
C. of poor quality B. laughing
D. expensive C. hooting

18. Sindi was brought up by a very strict woman. D. shouting

SECTION C

In each of the following sentences a group of words has been underlined. Choose from the alternatives lettered A to D the one that best explains the underlined group of words.

21. He feared that his father would ask where he B. the inhabitants were frightened and stood had been. This means that..... still
A. he was afraid when his father asked him C. the army came to the village in the storm where he had been D. the inhabitants were frightened and so
B. he would be afraid if his father asked ran away him where he had been 24. If you don't want to regret, cut your coat
C. he was frightened by the way his father according to your cloth. This means …… asked him where he had been. A. live within your means
D. he was afraid that his father would want B. use the coat cut from your cloth to know where he had been C. do not worry about the problems of

22. You shouldn't have hit Kuuku so hard; it others was rather unkind of you. From this we D. sew your own coat know that Kuuku was ..... 25. Kwasi is head over heels in love with Ama.
A. being naughty This means.....
B. hurt A. Kwasi looks at his heels when he sees
C. hit Ama
D. kind B. Kwasi's love for Ama is abnormal

23. When the army stormed the village, all the C. Kwasi can't control himself when he inhabitants took to their heels. This means sees Ama
A. the inhabitants danced around on their D. Kwasi is deeply in love with Ama heels

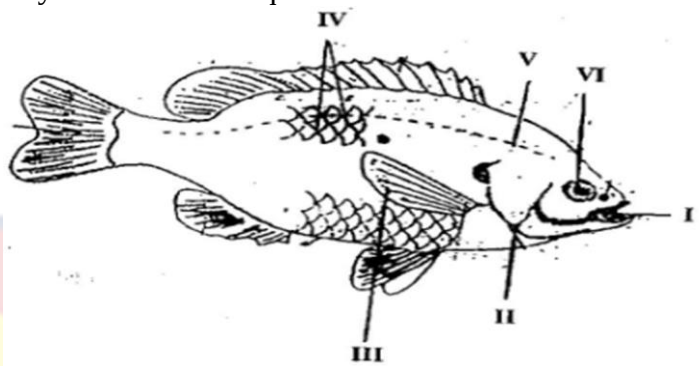
SECTION D

From the list of words lettered A to D, choose the one that is most nearly opposite in meaning to the word underlined in each sentence

26. It is a fact that Zaibu often gives accurate answers to questions.
    A. long
    B. silly
    C. interesting
    D. wrong
27. Kojo's teacher was reluctant to accept his explanation for being late to school.
    A. planning
    B. unable
    C. willing
    D. likely
28. My father was a very stout man.
    A. short
    B. lean
    C. handsome
    D. ill

29. We walked on the smooth side of the pavement. A. rough
    B. hard
    C. coarse
    D. slippery
30. The flower is made from artificial materials.
    A. natural
    B. preserved
    C. wonderful
    D. new

1. (a) The diagram below is an illustration of a fish.
Study the diagram carefully and answer the questions that follow.



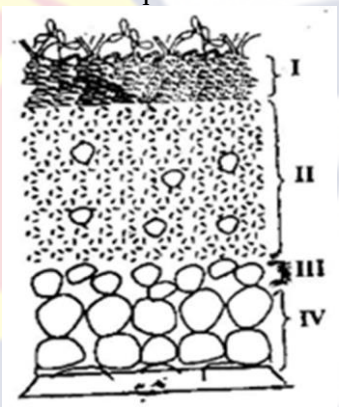
(i) Identify the fish
[1 mark]

(ii) Name each of the parts labelled I, II, IV, V
[4 marks]

(iii) Name the habitat of the fish
[1 mark]

(iv) Explain how each of the parts labelled III and VI enables the fish adapt to its habitat.
[4 marks]

(b) The diagram below is an illustration of a section through the soil.
Study the diagram carefully and answer the questions that follow.



(i) What does the diagram represent? [1 mark]

(ii) Name each of the parts labelled I, II, III, IV [4 marks]

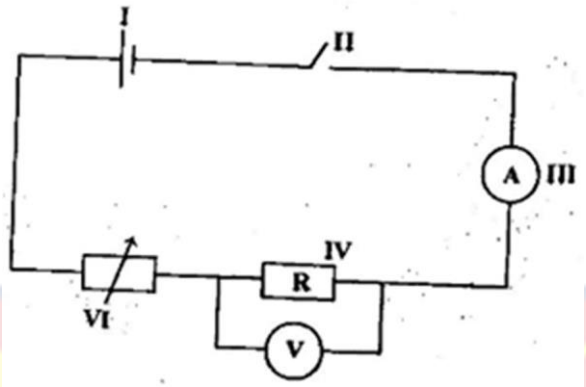
(iii) Which part of the diagram:

(α) is the richest in humus? [1 mark] (β) is the habitat for soil organisms? [1 mark]

(γ) undergoes weathering? [1 mark]

(iv) What is the effect of heavy rainfall on the part labelled I?[1 mark]

(c) The diagram below is an illustration of an electrical circuit.
Study the circuit and answer the questions that follow.



i Name each of the parts labelled I, II, IV, VI [4 marks]

ii State the energy transformation that takes place in:

(α) I [2 marks]

(β) IV [2 marks]

iii. State the S.I. units of the quantity measured by each of the parts labelled

(α) III [1 mark]

(β) V [1 mark]

iv. State the function of the part labelled VI [1 mark]

(d) In an experiment, equal volumes and equal concentrations of dilute hydrochloric acid and dilute sodium hydroxide solutions were each placed in different test tubes.

Read the following statements carefully

I. Both red and blue litmus papers were dipped into each of the solutions in turns.

II. Equal volumes of the solutions were mixed to obtain a third solution.

III. Both red and blue litmus papers were dipped into the third solution.

Use the information provided to answer the following questions.

(i) Explain briefly how you can identify each of the solutions.

(α) Hydrochloric acid; [2 marks]

(β) Sodium hydroxide. [2 marks]

(ii) State the type of reaction that occurred when the two solutions were mixed.

[1 mark]

(iii) What type of solution was formed when the reaction stated in (ii) occurred?

[1 mark]

(iv) State what would be observed when both red and blue litmus papers were dipped into the third solution. [2 marks]

(v) Explain how the solid portion of the solution named in (iii) could be obtained. [2 marks]

SECTION B [60 marks]

Answer four questions only from this section.

2. (a) (i) What are derived quantities?
(ii) State the S.I. units of the following quantities:
(α) area;
(β) volume.
(b) (i) State two factors necessary for photosynthesis
(ii) Explain the functions of each of the factors stated in (i)
(c) Explain each of the following terms:
(i) soft water;
(ii) hard water. [4 marks]
(d) State three reasons why some seeds are nursed. [3 marks]

(a) (i) What is a magnetic field?
(ii) Name two methods of making magnets [4 marks]
(b) Explain briefly the term teenage pregnancy [3 marks]
(c) Write the formula for each of the following compounds:
(i) calcium chloride;
(ii) copper (I) oxide;
(iii) nitrogen (IV) oxide;
(iv) ammonia [4 marks]
(d) (i) List three physical properties of soil.
(ii) What is the texture of clayey soil? [4 marks]

(a) (i) Explain the term hazard.
(ii) List two safety precautions against hazards in the teaching and learning of science. [4marks]
(b) In a tabular form state three differences between osmosis and diffusion. [3 marks]
(c) (i) What is weather?
(ii) State two differences between weather and season. [4 marks]
(d) (i) What is a fertile soil?
(ii) State two factors that cause loss of soil fertility. [4 mark]

3. (a) (i) What is malnutrition?
(ii) State one symptom each of the following deficiency disease: (α) scurvy; (β) rickets. [4 marks]
(b) Draw the potassium atom and show the distribution of electrons in its shells. [K = 19] [4 marks]
(c) (i) Define potential energy
(ii) An object of mass 10 kg is moving at a velocity of 2 ms–1. Calculate the kinetic energy of the object [5 marks]
(d) State one example each of:
i macro nutrients;
ii micro nutrients. [2 marks]

4. (a) (i) What is an ion?
(ii) State two methods of softening hard water. [4 marks]

(b) (i) Differentiate between pests and parasites as used in agriculture.
(ii) Give an example each of a:
(α) pest;
(β) parasite [4 marks]

(c) (i) What is work?
(ii) A force of 10 N causes a body to move a distance of 5.2 m in the direction of the force. Calculate the work done. [5 marks]

(d) Name two diseases associated with the circulatory system of humans [2 marks]

Mock Examination
INTEGRATED SCIENCE 1
OBJECTIVE TEST [45 minutes]

Answer all questions. Each question is followed four options lettered A to D. Find out the correct option for each question and shade in pencil on your answer sheet the answer space which bears the letter as the option you have chosen. Give to one answer to each question.

1. The space occupied by matter is its
A. Area
B. mass
C. volume
D. weight

2. A rheostat is used in an electric circuit in order to
A. increase electric current only.
B. decrease electric current only.
C. keep electric current constant
D. increase and decrease electric current

3. Which of the following methods protects pure iron from rusting by coating with zinc?
A. Alloying
B. Galvanizing
C. Greasing
D. Painting

4. The reason why alum is added to water during treatment is to
A. kill germs
B. give taste to water
C. make water colourless
D. make suspended particles settle

5. The leads of the transistor responsible for activation is the
A. Amplifier

B. Base
C. Collector
D. emitter

6. The type of management system which allows farm animals to roam about freely is known as
A. extensive system
B. intensive system
C. semi-extensive system
D. semi-intensive system

7. Sodium hydroxide is an example of a base because it A. has sour taste
B. has a pH less than 7
C. turns wet blue litmus paper red
D. turns wet red litmus paper blue

8. An atom has 6 protons and 7 neutrons in its nucleus. What is its mass number?
A. 1 B. 6
C. 7
D. 13

9. The part of the plant where pollination occurs is the
A. Flowers
B. leaves
C. roots
D. stems

10. Million's reagent is used to test for
A. Carbohydrates
B. Fats
C. Proteins
D. vitamins

11. The function of the platelets in the circulatory system of humans is to
A. transport oxygen
B. transport carbon dioxide
C. defend the body
D. clot the blood

12. A viable seed is one that
A. germinates under suitable conditions
B. contains oil
C. develops from fertilized ovary
D. has a pericarp

13. The S.I. unit for density is
A. ms –1
B. ms –2
C. kg m –3
D. m3 kg –1

14. Which of the following plants has its leaves modified for storing food?
A. Ginger

B. Onion
C. Pineapple
D. Tomato

15. Which of the following arrangements show the correct order of increasing complexity of structures in living organisms?
A. cells → organs → tissues → systems
B. cells --> tissues --> organs --> systems
C. cells --> systems --> tissues --> organs
D. cells --> tissues --> systems --> organs

16. Water that forms lather readily with soap is said to be
A. Clean
B. Hard
C. Soapy
D. Soft

17. Global warming is caused by the
A. circulation of oxygen in the atmosphere
B. excessive release of carbon dioxide into the atmosphere
C. release of hydrogen into the atmosphere
D. circulation of nitrogen in the atmosphere

18. One function of the root system of plants is to
A. excrete carbon dioxide
B. store waste materials
C. hold the plant firmly in the ground
D. prepare food for the plant

19. The conversion of agricultural produce from its original form to other desirable forms is termed
A. Preservation
B. processing
C. recycling
D. storage

20. Power is defined as the
A. ability to do work
B. force to move an object
C. rate of doing work
D. ability to replace energy used

21. Which of the following resources does not produce energy?
A. Coal
B. Sand
C. Water
D. Wind

22. The part of the flower that contains nectar is called
A. anther
B. petal
C. ovary
D. sepal

23. Which of the following human activities maintains the carbon cycle?
    A. Bush burning
    B. Felling of trees
    C. Release of fumes from factories
    D. Replanting of trees felled as timber
24. An atom which contains more electrons than protons becomes a
    A. positive ion
    B. negative ion
    C. neutral atom
    D. binary compound
25. The chemical formula of a compound describes the
    A. number of molecules in the compound
    B. type of bonding in the compound
    C. ratio in which the elements are combined
    D. state of the compound
26. The gas produced when glucose is oxidized during internal respiration is
    A. carbon (II) oxide
    B. carbon (IV) oxide
    C. hydrogen
    D. nitrogen
27. Which of the following methods of preserving food makes use of heat energy from the sun?
    A. Drying B. Frying C. Salting
D. Refrigeration
28. A mercury thermometer works on the principle that
    A. solids expand on heating and contract on cooling
    B. liquids expand on heating and contract on cooling
    C. gases expand on heating and contract on cooling
    D. liquids evaporate when heated to a certain temperature
29. Which of the following processes involves the solid state of matter? A. Boiling
    B. Condensation
    C. Evaporation
    D. Melting
30. A transistor is said to operate in an active region when
    A. one p-n junction is forward biased and the other is reversed biased
    B. base-emitter junctions are reversed biased
    C. both p-n junctions are reversed biased
    D. base-collector junction is forward biased
31. The practice of starting new organization in response to identified opportunities is termed
    A. Agribusiness
    B. business enterprise
    C. entrepreneurship

D. management

32. In electrical circuits, the component that protects appliances against very high currents is the
    A. Capacitor
    B. Fuse
    C. Resistor
    D. Switch
33. In a third-class lever the
    A. pivot is between the load and effort B. pivot is absent
    C. load is between the effort and pivot
    D. effort is between the load and pivot
34. Bathing in lakes and slow-moving streams can lead to one getting
    A. Bilharziasis
    B. Cholera
    C. Dysentery
    D. river blindness
35. Caterpillar is an example of A. an animal parasite that feeds on plant
    B. a plant parasite that lives on an animal host
    C. an animal parasite that feeds on animal host
    D. a plant parasite that grows on plant host
36. Capillary action is applied in the following activities except
    A. blotting an ink with a blotting paper
    B. absorption of water with a towel
    C. rising of water in a very narrow glass tube
    D. sticking of water droplets on the surface of a glass tube
37. A magnet can attract all these substances except
    A. drawing pins
    B. glass
    C. steel
    D. iron nails
38. The force that opposes the motion of an object on another object is called
    A. electrical force B. frictional force
    C. gravitational force
    D. magnetic force
39. When the north poles of two magnets are brought together they
    A. attract each other
    B. repel each other
    C. first attract and then repel each other
    D. have no effect on each other
40. A simpler way of maintaining the efficiency of a machine is by
    A. oiling its parts
    B. fitting new parts on the machine
    making sure it is always working
D. making sure it works at low speed

MOCK EXAMINATION

AUGUST, 2022
INTEGRATED SCIENCE
ESSAY AND OBJECTIVE
1HR 45 MINUTES

NAME: .....

INDEX NUMBER: .....

SAGNARIGU MUNICIPAL EDUCATION DIRECTORATE

BASIC **EDUCATION CERTIFICATE EXAMINATION**

AUGUST, 2022 INTEGRATED SCIENCE 2hrs

ESSAY & OBJECTIVES

Do not open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your name in the spaces provided above.

This booklet consists of two papers. Answer Paper 2 which comes first, in your answer booklet and Paper 1 on your Objective Test answer sheet. Paper 2 will last 1 hour 15 minutes after which the answer booklet will be collected.

Do not start Paper 1 until you are told to do so.

Paper 1 will last 45 minutes.

MATHEMATICS 2 [ESSAY]

Answer four questions only.

All questions carry equal marks.

All working must be clearly shown. Marks will not be awarded for correct answers without corresponding working

1. (a) (i) Find the least Common Multiple (L.C.M.) of 9, 18 and 16.

(ii) Arrange , — and — in ascending order of magnitude

(b) Using a ruler and a pair of compasses only,

(i) construct a triangle PQR with length PQ = 10 cm, angles QPR = 45° and PQR = 60°.

(ii) Construct the perpendicular bisectors of PR and RQ to meet at T.

(iii) Measure the length of TP.

2. (a) The table below shows the scores of some students in an examination

Scores	0	1	2	3	4	5	6	7	8	9	10
Frequency	3	5	3	2	7	6	5	4	2	2	1

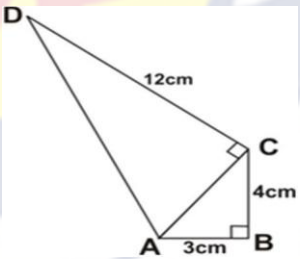
From the table find

(i) how many students wrote the examination
(ii) the modal score
(iii) the number of students that scored 7 or more
(iv) the mean score correct to one decimal place

(b) A plot of land measures 25m by 12m. A portion of this plot measuring 8m by 8m is used for the cultivation of vegetables. Find the area of the plot not cultivated.

3. (a) On a graph sheet draw two perpendicular axes OX and OY.
(b) Using a scale of 2cm to ¢50,000.00 on the OX axis and 2cm to GH¢5.00 on the OY axis, mark the Ox axis from 0 to ¢450,000 and OY axis from 0 to GH¢50.00
(c) Plot the points and join them with a straight line
(d) From your graph find the value of
i. GH¢8.00 in cedis (¢) ii. GH¢35.00 in cedis (¢) iii. ¢260,000.00 in Ghana Cedis (GH¢)

4. (a) Find the sum of 2,483.65, 701.532 and 102.7, giving your answer to one decimal place.



(b) In the quadrilateral ABCD above, |AB| = 3 cm, |BC| = 4 cm, |CD| = 12 cm and angle ABC = 90°.
Calculate:
(i) the perimeter of ABCD
(ii) the area of ABCD

27□34□53
(c) Evaluate $\frac{}{2 \square 3 \square 5}$ leaving your answer in standard form.

5. (a) A rectangular tank of length 22 cm, width 9 cm and height 16 cm is filled with water. The water is poured into a cylindrical container of radius 6 cm. Calculate the : (i) volume of the rectangular tank

(ii) depth of water in the cylindrical container.

[Take $\pi = 22/7$]

(b) The area of a trapezium is 31.5 cm2. If the parallel sides are of lengths 7.3 cm and 5.3 cm, calculate the perpendicular distance between them.

(c) Simplify 7 - 4 + 2

6. (a) The perimeter of a rectangular plot of land whose length is (2x+5) m and width (x – 10) is 80 m.

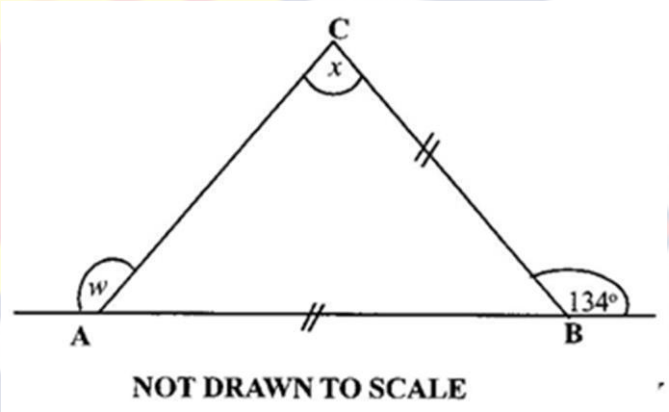
Find the

(i) value of x;

(ii) area of the plot;

(iii) cost of weeding the plot at GH¢ 0.24 per m2.

(b) Find the value of x and w in the diagram below if $|AB| = |BC|$



NOT DRAWN TO SCALE

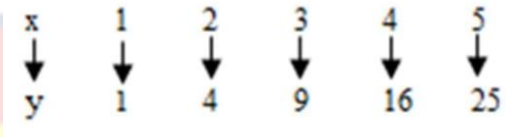
MATHEMATICS 1
OBJECTIVE TEST
45 minutes

Answer all questions. Each question is followed four options lettered A to D. Find out the correct option for each question and shade in pencil on your answer sheet the answer space which bears the letter as the option you have chosen. Give to one answer to each question.

1. If $P = \{x : x$ is an even number greater than two and less than or equal to twelve$\}$, list the members of P
   A. {2, 4, 6, 8, 10, 12}
   B. {3, 4, 6, 8, 10, 12}
   C. {2, 4, 6, 8, 10}
   D. {4, 6, 8, 10, 12}
2. The sum of the interior angles of a regular polygon with 10 sides is
   A. 144°
   B. 900°
   C. 1440°
   D. 1800°
3. When a number is doubled and the result is decreased by 9, the answer is 19. Find the number.
   A. 5
   B. 7
   C. 14
   D. 16
4. How many integers are within the interval $-5 < x < 7$?
   A. 10 B. 11 C. 12
   D. 13
5. A piece of cloth is 8.4 m long. If 30 cm is needed to sew a napkin, how many napkins can be sewn from this piece of cloth?
   A. 20 B. 25 C. 28 D. 30
6. Two bells P and Q ring at intervals of 3 hours and 4 hours, respectively. After how many hours will the two bells first ring simultaneously (at the same time)?
   A. 6 hours
   B. 8 hours
   C. 12 hours
   D. 24 hours
7. A wrist watch is priced GHC 2,000.00. A shopkeeper allows a discount of 2% on the cost price. Find the discount on 20 of such wrist watches.
   A. GHC 500.00
   B. GHC 600.00
   C. GHC 800.00
   D. GHC 1,000.00

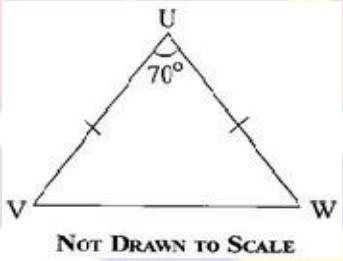
8. The bearing of Atoru from Busase is 275°.
What is the bearing of Busase from Atoru?
   A. 180°
   B. 175°
   C. 095°
   D. 075°

9. Find the rule for the following mapping



   A. $y \rightarrow x+2$
   B. $y \rightarrow 2x$
   C. $y \rightarrow x^2$ D. $y \rightarrow 2x+2$

10.



In the diagram, UVW is an isosceles triangle, |UV| = |UW| and angle VUW = 70°. Find angle UVW A. 70° B. 60° C. 55°
   D. 35°

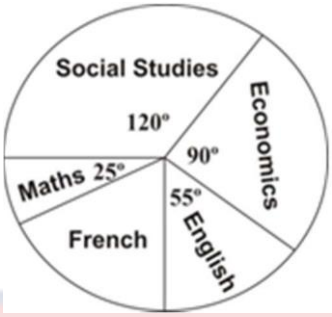
11. Factorize completely $b^2 + fb - mb - fm$
   A. $(b - f)(b - m)$
   B. $(b + f)(b - m)$
   C. $(b + f)(m - b)$
   D. $(b + f)(m + b)$

12. Find the circumference of a circle whose area is equal to 64π cm^2.
   A. 32π cm
   B. 16π cm
   C. 8π cm
   D. 4π cm

13. If $2x = 5(x - 2) + 7$, find the value of x
   A. $-5\frac{2}{3}$
   B. –1
   C. 1
   D. $5\frac{2}{3}$

14. Find the smallest number which is divisible by 16 and 20? A. 40
   B. 80
   C. 120
   D. 160

The pie chart below shows the performance of Kate in her final examination. Use the diagram to answer Questions 15 and 16.



15. What is the angle for French?
    A. 120°
    B. 100°
    C. 70°
    D. 35°
16. If Kate scored 60% in Social Studies, what was her score in Economics?
    A. 45%
    B. 54%
    C. 72%
    D. 90%
17. The letters in the word HIPPOPOTAMUS are placed in a box. What is the probability of taking out a letter that is a vowel?
    A. 1/12
    B. 3/12
    C. 5/12
    D. 7/12
18. Solve the inequality $3x + 6 \leq 5x - 2$
    A. $x \leq 2$
    B. $x \geq 2$
    C. $x \leq 4$
    D. $x \geq 4$
19. Simplify $6p^3$ $\frac{35}{13}$ $\times$ p^2 $\div$ $3p^4$
    A. 2p
    B. 3p
    C. 18p D. $2p^2$
20. Calculate $\frac{35}{8}$ 82.5 ÷ 0.25, expressing the answer in the standard $\frac{5}{35}$ form A. 3.3×10^{-3} B. 3.3×10
    C. 3.3×10^2
    D. 3.3×10^3
21. The angle formed by one complete revolution is equivalent to A. one right angle
    B. two right angles
    C. three right angles
    D. four right angles
22. Abena spent of her money on sweets, on provisions and the rest on gari. What fraction of her money did she spend on gari?

A

B

C
D

23. An angle which is greater than 180° but less than 360° is A. a right angle
    B. an acute angle
    C. an obtuse angle
    D. a reflex angle
24. A car travels at an average speed of 45 km per hour. What distance does it cover in 12 hours?
    A. 450km
    B. 480km
    C. 500km
    D. 540km
25. A man divided his 360 cattle among his three sons in the ratio 7:6:5. How many cattle did the one who had the smallest share receive?
    A. 100
    B. 120
    C. 140
    D. 160

find the value $\sqrt{p2 \square q2,}$ $\sqrt{p \square q}$

26. Given that = $13^2 \square 15^2$

of a, if a =.
    A. 28
    B. 175
    C. 195
    D. 247
27. Which of the following best describes the statement: 'The locus of a point which moves so that its distance from two fixed points are always equal'? A. Bisector of an angle
    B. Perpendicular bisector
    C. Circle
    D. Two parallel lines
28. Find the volume of a cylinder of height 3 cm and radius 2 cm. A. 6π cm^3
    B. 12π cm^3
    C. 18π cm^3
    D. 24π cm^3
29. Express 1352 as a product of prime factors.
    A. $2^3 \times 13^3$ B. $2^3 \times 13^2$ C. $2^2 \times 13^3$ D. $2^2 \times 13^2$
30. Which of the following statements about sets is true?
    A. Every set is a subset of the null set.
    B. The universal set is the subset of the null set
    C. The intersection of two sets is always a null set

D. The universal set is the union of all its subsets

31. Correct 5178.3426 to two decimal places
    A. 5178.00 B. 5178.30
    C. 5178.34
    D. 5178.35
32. Which property of arithmetic operation is illustrated by the statement: $a \times (b + c) = ab + ac$?
    A. Addition
    B. Distributive
    C. Association
    D. Commutative

33. The sum of the interior angles of a regular polygon is 540°. Find the number of sides of the polygon. A. 7 B. 6 C. 5
D. 4
34. A hall which is 20 m long is represented on a diagram as 10 cm long. What is the scale of the diagram? A. 1:200 B. 1:250 C. 1:400
D. 1:500
35. Divide 1.612 by 0.4
    A. 4.3
    B. 4.03
    C. 0.403
    D. 0.43
36. Find the number that can be added to 207 to make the sum divisible by 17.
    A. 3
    B. 13 C. 14
D. 30
37. Mark is 30 years old. Yaw is half as old as Mark. Paul is 10 years older than Yaw. How old is Paul? A. 30 years B. 25 years
    C. 20 years
    D. 15 years
38. Find the product of 17 and 121.
    A. 968
    B. 1,751
    C. 2,057
    D. 8,591
39. Find the least common multiple (LCM) of the numbers 10, 15 and 25.
    A. 30
    B. 60
    C. 120
    D. 150
40. A set of furniture was sold for GH¢ 3000.00 at a profit of 20%. Find the cost price.
    A. GH¢ 2500.00
    B. GH¢ 2400.00
    C. GH¢ 2000.00
    D. GH¢ 1800.00