Primary School Teachers' Implementation of the Authentic Assessment and Application of Results within the Standards-Based Science Curriculum in Effutu Municipality, Ghana

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Abstract: This study explored the implementation of authentic assessment by primary science teachers within the Standards-Based Curriculum in the Effutu Municipality, using a descriptive survey design with a sample of 180 teachers. Additionally, four teachers were purposively sampled for classroom observation. Data was collected using a Classroom Assessment Conception Scale and a Classroom Assessment Lesson Observation Protocol. Descriptive statistics was used to analyze the data. Inferential statistics, specifically the independent sample t-test and One-way ANOVA, were employed to test hypotheses. Observation guide data was subjected to summative analysis. The study's findings revealed that teachers engaged in various authentic assessment tasks. It also came to light that authentic assessment results were underutilized. No significant difference was found in the use of authentic assessment tasks between public and private schools, nor in the utilization of assessment results across different educational circuits. The study recommended that stakeholders in the Effutu Municipality should invest in technology and provide training for primary science teachers to integrate authentic assessment tasks more effectively.

Keywords: Authentic assessment; science teachers; standards-based curriculum; primary school; educational circuits of schools.

Introduction

The development of academic competencies is fundamentally reliant on effective teaching and assessment practices, which are integral components of the educational process. Teaching provides knowledge, skills and attitude while assessment collects information to make important decisions about students (Ferreira et al., 2020). Therefore, teaching and learning require assessment as a vital component. Yet, assessment can hinder learning if it is inappropriate or does not align with the needs and expectations of students and teachers. Researchers have explored various methods to assess students' knowledge, competence and performance. For instance, Wang et al. (2021) found that misaligned assessments can negatively impact student motivation and engagement while well-designed assessments can enhance learning outcomes by providing meaningful feedback and promoting deeper understanding. Similarly, Hwang et al. (2020) emphasized the importance of aligning assessment practices with instructional goals to support student learning effectively.

According to Mulenga and Kabombwe (2019), educational culture has shifted from a knowledge-based to a competency-based system, even though educational goals have traditionally focused on producing knowledgeable students and a future workforce. This shift underscores the need for assessments that not only measure knowledge but also evaluate the competencies required for real-world applications. As educational systems evolve, it becomes crucial to develop assessment practices that reflect this competency-based approach. Such practices ensure that students are not only knowledgeable but also equipped with the skills and abilities necessary for their future careers and societal contributions. This transition highlights the importance of aligning educational assessments with the demands of the modern workforce, thereby fostering a more holistic development of students that prepares them for the complexities of real-world challenges.

Several reviewed reports from different countries have revealed that students are not adequately prepared for the world of work after they complete school (Carver-Thomas & Darling-Hammond, 2019; Hadar et al., 2020; Yusuf, 2023). Carver-Thomas and Darling-Hammond (2019) highlighted that many students lack essential skills required in the workforce, such as critical thinking and problem-solving abilities. Similarly, Hadar et al. (2020) found that graduates often feel unprepared for the practical demands of their jobs, indicating a gap between academic training and workplace expectations. Yusuf (2023) further reported that students frequently struggle with transitioning from academic environments to professional settings due to insufficient practical experience. Dondi et al. (2021) attributed this problem to the misalignment between school standards and the expectations of the world of work. They argued that educational institutions often emphasize theoretical knowledge over practical skills, which are crucial for job readiness. This misalignment necessitates a re-evaluation of educational standards to better prepare students for the demands of the modern workforce, ensuring they possess the competencies needed for successful careers.

The educational assessment system of Ghana, especially at the basic school level involves class exercises, home assignments, midterm tests, final examinations and national examinations. Learners are authorized to move to the next class based on the results of the summative assessment done at the end of a teaching unit or an academic year (Baidoo-Anku, 2023). Butakor and Ceasar (2021) observed that due to the large class sizes of 30 to 40 students at the JHS level among Cape Coast public schools, teachers often resort to using multiple-choice and theoretical questions to test learners' performance. This type of assessment may not offer the learners the opportunity to express mastery of what they learnt. To address the limitations of traditional assessments, authentic assessment methods can be employed. These methods provide more comprehensive evaluations of student learning and can better align with the needs of both students and teachers. These approaches allow students to demonstrate their understanding and skills in more practical and meaningful ways.

Contemporary educational reforms dictate the need for teachers to assess learners using authentic approaches (Ching & Wang, 2021). Authentic assessment is a learner-centered approach that evaluates students' abilities through tasks that mirror the complexity and practicality of real-world challenges. It moves beyond traditional testing to encompass a variety of dynamic methods, such as projects and portfolios that require students to apply their knowledge and skills in meaningful ways (Dwamena et al., 2023). This form of assessment aims to prepare learners for professional and

personal success by emphasizing practical problem-solving abilities, critical thinking, effective communication and collaboration.

Empirical evidence has shown that authentic assessment has significantly improved instructional outcomes for both teachers and learners (Aziz et al., 2020; Huckle et al., 2021). For instance, Aziz et al. (2020) found that authentic assessment practices enhance student engagement and motivation by providing real-world relevance to learning tasks. Similarly, Huckle et al. (2021) reported that teachers who implement authentic assessments are better able to identify and address individual student needs, leading to more personalized and effective instruction. These findings underscore the importance of integrating authentic assessment strategies into teaching practices. By doing so, educators can create more meaningful and impactful learning experiences that not only measure student knowledge but also develop critical thinking and problem-solving skills. Therefore, it becomes critical to address the need for teachers to practice authentic assessment strategies, ensuring that they are equipped with the necessary tools and training to implement these methods effectively in their classrooms.

All over the world, educational systems have resorted to curricular changes that see to the integration and use of authentic assessment. Countries, such as Australia, Malaysia, Indonesia, Turkey and Kenya have reformed their educational system to incorporate authentic assessment strategies to ensure that learners move beyond learning by rote memorization of concepts. These reforms have resulted in the formation of learners who adopt profound approaches to learning rather than surface ones. This results in the abilities of learners to construct original responses and apply learned concepts in real-life situations (Apau, 2021). It is to this end that the Ministry of Education, through the National Council for Curriculum and Assessment of Ghana, integrated authentic assessment into the Standard-Based Curriculum used in primary schools in Ghana (NaCCA, 2019, p. xiii). As such, both public and private primary school teachers went through a five-day nationwide sensitization training before implementing the new curriculum.

Teachers are considered the most influential factor in educational reforms intended to promote students' learning (Mensah & Jackson, 2018).

Science teachers, therefore, become key, to the achievement of academic literacy at all levels of education because of the essential role they play in aligning science curriculum content to assessment. Teachers are expected to facilitate students' learning and implement classroom assessments in a manner that will enhance meaningful learning outcomes (Putra, 2021). Teachers' instructional and assessment practices are a means by which the education system is enhanced and defined (Pons & Houldsworth, 2020). For this reason, it becomes imperative to understand their classroom assessment practices.

The body of research on authentic assessment in Ghana remains limited (Bordoh et al., 2015; Butakor & Ceasar, 2021; Kankam et al., 2014; Mintah, 2017; Osman, 2021). Bordoh et al. (2015) revealed that while social studies teachers possess a foundational understanding of authentic assessment, its classroom application is inconsistent due to such constraints as policy limitations and resource availability. Butakor and Ceasar (2021) found that teachers perceive authentic assessment as beneficial for students' performance, particularly in fostering higher-order thinking skills. However, Kankam et al. (2014) identified a significant gap between teachers' recognition of the value of authentic assessment techniques and their actual implementation in social studies lessons. Mintah (2017) and Osman (2021) reported similar discrepancies in other subject areas, highlighting a systemic issue within the educational framework. This study sought to address these gaps by investigating the authentic assessment practices of primary school science teachers and examining how they utilize the results. By doing so, it aimed to provide insights that could inform more effective implementation strategies, ultimately enhancing the educational outcomes for students in Ghana. Specifically, this study sought to respond to the following research questions:

1. What kinds of authentic assessment tasks do primary school science teachers in the Effutu Municipality use to assess their pupils' learning outcomes?

2. In which ways do primary school science teachers in the Effutu Municipality use the authentic assessment results?

The study further tested the following null hypotheses:

1. **H$_{01}$:** There is no significant difference in the kinds of authentic assessment tasks used by public and private primary school science teachers in the Effutu Municipality.

2. **H$_{02}$:** There is no significant difference in the use of authentic assessment results in the educational circuits of schools in the Effutu Municipality.

The hypotheses are grounded in the assumption that educational practices and resource allocation may vary between public and private schools, potentially influencing the types of assessment tasks employed. However, given the overarching educational policies and training programs that aim to standardize teaching practices across different types of schools, it is hypothesized that no significant differences will be found. Similarly, the use of assessment results is expected to be consistent across educational circuits due to standardized reporting and utilization protocols mandated by educational authorities. Testing these hypotheses will help determine whether these assumptions hold and identify any areas where policy adjustments or additional support may be needed to ensure equitable and effective assessment practices.

Methodology

Design
This study used the descriptive survey design, which is a systematic and structured approach for collecting data from a sample of individuals or entities within a larger population (Kim et al., 2017). The primary aim of this design was to provide a detailed and accurate description of the characteristics, behaviors, opinions and attitudes that existed within the target group. The descriptive survey design was considered the most appropriate for analyzing the respondents' practices of authentic assessment because it allows for a comprehensive and systematic collection of data on the current state of these practices. This design is particularly effective in capturing detailed information about the behaviours, attitudes, and perceptions of a large group of teachers, providing a clear snapshot of how authentic assessment is being implemented in classrooms (Rea & Parker, 2014).

Population and Sampling
The researchers were interested in only primary schools because the use of the Standards-Based Curriculum in Ghana was only peculiar to primary

schools at the time of the study. At the time of the study, there were a total of 261 districts, which included metropolitan, municipal and district assemblies in Ghana. The Effutu Municipality was chosen as the study site due to its uniqueness in the implementation of the Standards-Based Curriculum at the primary school level. This Municipality has been at the forefront of adopting and integrating this curriculum, making it an ideal location to investigate the practices and impacts of authentic assessment. Additionally, the presence of the University of Education, Winneba, within the Effutu Municipality provided a supportive environment for educational research and collaboration with local schools. This strategic choice allows for a more in-depth exploration of how primary school science teachers implement authentic assessment and utilize the results, providing valuable insights that can inform broader educational practices and policies in Ghana.

The target population was all primary school science teachers in the Central Region of Ghana. The accessible population was all the 338 primary science teachers in the Effutu Municipality. The Krejcie and Morgan (1970) formula was used in this study to determine the sample.

$$.S = \frac{(X^2NP)(1-P)}{d^2(N-1)+X^2P(1-P)}$$

Where **N** is the population size, **P** is the Population proportion (expressed as a decimal) (assumed to be 0.5 (50%), and **d** is the degree of accuracy (5%), expressed as a proportion (0.05); It is a margin of error. **S** is the sample size of a finite population size; **X** is the z-value or confidence level of 95%, which is 1.96. Therefore, for this study, N is the accessible population size of three hundred and thirty-eight (338) teachers. The researchers referenced the Krejcie and Morgan (1970) table where all the sample sizes for each corresponding population group had been pre-calculated. The resultant sample size calculated was 180. Out of this number, 102 representing 60.0% were males while 78 representing 40.0% were females.

The study used proportionate stratified sampling and simple random sampling techniques in the selection of the study sample. A stratified sampling technique was used to obtain a true representative sample of the schools. The groups used for stratification were three educational circuits in the municipality: Winneba Central, Winneba East and

Winneba West. At the time of the study, there were 52 schools in the Effutu Municipality and the researchers used 30 out of the 52 schools based on studies recommending at least ten percent of the population as sample size (Wang et al., 2019). Proportional stratified sampling was then used to select 10 schools from Winneba Central, 15 schools from Winneba East, and 5 schools from Winneba West. Simple random sampling was then used to select 6 primary science teachers from each of the 30 schools used in the study (Table 1).

Table 1: Sample Size of Primary Science Teachers

Name of circuit	Number of schools used in circuit	Number of teachers selected in each school	Total number of teachers used in circuit
Winneba Central	10	6	60
Winneba East	15	6	90
Winneba West	5	6	30
Total	**30**	**18**	**180**

The questionnaire was administered to 180 teachers, achieving a 100% response rate. The researchers coordinated with the schools to distribute the questionnaires on agreed dates, ensuring that permission was obtained from the school heads at each location. Additionally, four teachers were purposively selected for classroom observation to gain deeper insights into their assessment practices. The four teachers, chosen from the initial sample of 180, each had over 10 years of teaching experience. Their extensive experience provided a rich and insightful perspective on the implementation of authentic assessment practices, ensuring that the observations captured well-established and effective strategies. This approach offered valuable insights for both current and future educational practices.

Sources of Data

Data was collected using both a close-ended questionnaire and an observation guide. The close-ended questionnaire was adapted from the Classroom Assessment Conception Instrument [CACI] of Zhang and Burry-Stock (2003) to measure teachers' practices in the authentic assessment process. The questionnaire was in three sections. Section A consisted of 7 items made up of the biographical data of the respondents. Section B contained 8 statements on a 5-point Likert scale labeled: strongly disagree, disagree, undecided, agree and strongly agree. This section solicited data on the authentic assessment tasks used by teachers. Section C consisted of 10 statements on a 5-point Likert scale. This section solicited data on how teachers used the authentic assessment results.

The study adapted the Classroom Assessment Lesson Observation Protocol [CALOP] (Local Systematic Change International, 2000) to collect systematic data on primary school science teachers' practices of authentic assessment. The instrument was developed to measure the quality of an observed K-12 science classroom lesson by examining the design, implementation, science content, assessment and culture of that lesson. This research tool was particularly adapted because it has the potential to gather data representing all aspects of teachers' classroom assessment practices. This could help teachers see the connections between all parts of the assessment cycle and assist researchers interested in further studies in this area. The items were therefore modified to meet the Ghanaian classroom context.

Validity and Reliability

To ensure the robustness of the research instruments, the researchers conducted thorough evaluations of both face and content validity. Face validity was assessed to confirm that the instruments appeared to measure what they were intended to measure. Content validity was evaluated to ensure that the instruments comprehensively covered all relevant aspects of the constructs being studied. A panel of experienced teachers scrutinized and evaluated the relevance of the instruments. The invaluable feedback received informed the final refinement of the instruments.

Subsequently, the researchers conducted a pilot test to establish the reliability of the questionnaire and the observational guides. The pilot test was carried out in the Gomoa West District of the Central Region. To gauge the internal consistency of the questionnaire items, the researchers performed a reliability analysis using Cronbach's Alpha statistic. The resulting reliability coefficient was $\alpha = 0.88$, indicating strong internal consistency as per Schrepp (2020).

Additionally, the researchers piloted the Classroom Assessment Lesson Observation Protocol (CALOP) with two teachers. These teachers participated in the rating process during the pilot study. To assess consistency among raters, the researchers employed the inter-rater reliability analysis using the Kappa statistic. The inter-rater reliability for the two raters was found to be Kappa = 0.72 (p < 0.05), with a 95% confidence interval of (0.647, 0.792) (Peyton et al., 2021).

Statistical Treatment of Data

The data from the questionnaire was coded to reflect their corresponding categories, using the following scoring key: strongly disagree-1, disagree-2, undecided-3, agree-4 and strongly agree-5. Afterward, the five-point Likert scale was recoded to a three-point Likert scale and the data was analyzed using descriptive statistical methods such as percentages, frequencies, means and standard deviations. The inferential statistical tools, an Independent Sample T-test and a One-Way ANOVA analyzed the hypotheses. A summative content analysis was used to analyze the data obtained from the observation in this study. The analysis began with identifying and quantifying words and actions about teachers' assessment practices. Ratings were given to represent the extent to which these key items of interest in the observation guide emerged. One (1) represented 'Not at all' degree of use, two (2) represented 'Some level of evidence' degree of use, three (3) represented 'Clear evidence' degree of use and four (4) represented 'A greater extent' degree of use.

Ethical Considerations

The researchers maintained a steadfast commitment to ethical considerations. Prior permission to conduct the study was obtained from the Effutu Municipality Directorate of the Ghana Education Service (GES). Furthermore, the researchers actively encouraged respondents to participate voluntarily, ensuring that their rights such as the right to be informed, the right to privacy and the right to choose, were rigorously upheld. Confidentiality was strictly maintained to safeguard all information provided by the participants.

Results and Discussions

The results of this study appear in alignment with the research questions that guided the investigation.

Research Question 1: What kinds of authentic assessment tasks do primary school science teachers in the Effutu Municipality use to assess their pupils' learning outcomes?

Findings in Table 2 indicate that primary school science teachers in the Effutu Municipality, to small extent engaged their pupils in various authentic assessment tasks, with some activities falling within the "Neutral" category.

Table 2: Kinds of Authentic Assessment Tasks Primary Science Teachers

No	Statement	D (%)	UD (%)	A (%)	M	SD
1	Learners are engaged in computer simulations	92(51.1)	52 (28.8)	36 (20.0)	2.86	1.32
2	Learners are engaged in projects	68(37.8)	40 (22.2)	72 (40.0)	3.02	1.35
3	Learners are engaged in report writing	72(40.0)	40 (22.2)	68 (37.6)	3.03	1.39
4	Learners are engaged in exhibitions	67(37.2)	42 (23.3)	71 (39.4)	3.05	1.42
5	Learners are engaged in portfolio	58(32.2)	42 (23.3)	80 (44.4)	3.06	1.42
6	Learners are engaged in self-assessment	63(35.0)	34 (18.9)	83 (46.1)	3.34	1.41
7	Learners are engaged in experiments	67(42.7)	29 (16.1)	84 (46.6)	3.15	1.51
8	Learners are engaged in peer assessment	65(36.1)	31 (17.2)	96 (53.3)	3.38	1.44

Mean interpretation: 4.50-5.0= strongly agree; 3.50-4.49 = agree, 2.50-3.49 = Neutral, 1.50-2.49 = disagree; 1.00-1.49 = strongly disagree.

Tasks such as computer simulations (mean = 2.86), projects (mean = 3.02), report writing (mean = 3.03), exhibitions (mean = 3.05), portfolio (mean = 3.06), self-assessment (mean = 3.34), experiments (mean = 3.15) and peer assessment (mean = 3.38) all indicate a neutral stance from the teachers.

This suggests that while these activities are being utilized, there is no strong consensus among teachers regarding their effectiveness or frequency of use. Notably, self-assessment and peer assessment are closer to the "Agree" category, indicating a slightly higher level of engagement and perceived value in these tasks. This nuanced interpretation highlights areas where teachers might be more confident or see more benefit, providing valuable insights for further professional development and support in these areas. Overall, the data suggests a balanced but cautious approach to implementing authentic assessment tasks in primary science education within this municipality.

Aligning these findings with existing literature, Fox and Soller (2011) found that teachers in Malawi used peer assessments and experiments to teach difficult concepts, leading to significant improvements in student performance. This supports the current study's finding that peer assessment and experiments are commonly used by teachers in the Effutu Municipality. Similarly, Fook and Sidhu (2010) reported that teachers in Malaysia employed various authentic assessment tools, including portfolios, projects and performance products, which were well-received by students. This aligns with the current study's findings that portfolios, experiments and projects are frequently used by primary school science teachers in the Effutu Municipality. The literature consistently highlights the benefits of authentic assessment in enhancing student engagement and performance. Authentic assessments, such as those identified in this study, replicate real-world challenges and require students to demonstrate their understanding and problem-solving skills.

Research Question 2: In which ways do primary school science teachers in the Effutu Municipality use the authentic assessment results?

The results, presented in Table 3, provide a detailed overview of how these teachers apply the results of authentic assessments in their teaching practices.

Using the scale (4.50-5.0 = strongly agree, 3.50-4.49 = agree, 2.50-3.49 = neutral, 1.50-2.49 = disagree, and 1.00-1.49 = strongly disagree), the data in Table 3 reveals that primary school science teachers in the

Effutu Municipality utilized authentic assessment results in various impactful ways. The lowest mean score (4.05) still falls within the "Agree" category, indicating that teachers find the results useful for additional teaching. This is followed by the use of results for administrative purposes (mean = 4.12), learners' development (mean = 4.13) and aiding self-reflection (mean = 4.16). Teachers also agreed that the results support individual and social development (mean = 4.24), aid learners' progress (mean = 4.25), and help focus instruction (mean = 4.36). The use of results to design learning activities (mean = 4.39) and to aid learners in setting their own goals (mean = 4.41) also fall into the "Agree" category. The highest mean score (4.53) indicates that teachers strongly agreed that the results help in developing teaching. Overall, the data suggests that teachers find authentic assessment results highly beneficial across multiple dimensions of their teaching practice, enhancing both instructional strategies and student development. This comprehensive use of assessment results underscores the importance of authentic assessments in fostering a reflective and adaptive teaching environment.

Positioning these findings with existing literature, Mussawy (2012) revealed that a shared understanding existed among teachers concerning the main purpose of authentic assessment, which is to improve instruction and increase learning. This supports the current study's finding that teachers use authentic assessment results to develop teaching and aid learners' progress.

Table 3: Use Authentic Assessment Results by Primary Science Teachers

No	STATEMENT	D (%)	UD (%)	A (%)	M	SD
1	Results aid additional teaching	0 (0)	34 (18.9)	146 (81.1)	4.05	0.65
2	Results help administrators	0 (0)	34 (18.9)	146 (81.1)	4.12	0.69
3	Results aid learners' development	0 (0)	16 (8.9)	164 (91.1)	4.13	0.54
4	Results aid self-reflection	0 (0)	18 (10)	162 (90)	4.16	0.58
5	Results aid individually and socially	18 (10)	0 (0)	162 (90)	4.24	0.88
6	Results help learners' progress	0 (0)	18 (10)	162 (90)	4.25	0.62
7	Results help focus instruction	0 (0)	0 (0)	180 (100)	4.36	0.48
8	Results help in designing learning activities	0 (0)	16 (8.9)	164 (91.1)	4.39	0.65
9	Results aid learners set their own goals	0 (0)	18 (20)	162 (90)	4.41	0.66
10	Results help in developing teaching	0 (0)	16 (8.9)	164 (91.1)	4.53	0.65

Similarly, Birenbaum (2013) found that information on how a student arrived at an answer or conclusion can be valuable in guiding instruction and monitoring the progression of student learning. This also aligns with the current study's findings that teachers use assessment results to design learning activities and support learners' development.

Wiggins (2011) emphasized that if tests occur only at the end of the term, the results can hardly be used to adapt instruction and improve learning. This is consistent with the current study's finding that teachers use assessment results throughout the teaching process to aid self-reflection and focus instruction. Both studies highlight the importance of

continuous and formative assessment in enhancing educational outcomes.

While the current study and existing literature both emphasize the multifaceted benefits of authentic assessment, the current study provides specific insights into how these assessments are utilized in the Effutu Municipality. The similarities underscore the global relevance of authentic assessment practices, while the differences highlight the unique contextual applications in different educational settings.

Table 4: Observation of Assessment Practices Used by Primary School Science Teachers in the Classroom

No.	STATEMENT	LPT1	LPT2	UPT1	UPT2	M
1	Teacher probes leaners' reasoning	1	1	3	1	1.5
2	Learners are given immediate feedback when they need directions to proceed	2	2	2	2	2.0
3	The teacher's questioning strategies are likely to enhance the development of student problem-solving (e.g., emphasized higher-order questions, and identified prior conceptions and misconceptions)	2	2	3	2	2.25
4	Choose and vary authentic assessment tools and methods for instructional decisions	3	3	3	1	2.5
5	Learners serve as peer-assessors and self-assessors during the assessment	2	3	3	2	2.5
6	The assessment task provides learners with a realistic picture of the activities they do in their daily activities	3	3	3	1	2.5
7	The design of the lesson incorporates tasks, roles, and interactions consistent with investigative science	3	3	3	1	2.5
8	The design of the lesson allows the teacher to monitor learners' progress	3	3	3	3	3.0

1 = Not at all, 2 = some evidence, 3 = clear evidence, 4 = to greater extent. LPT1= lower primary teacher 1, LPT2=lower primary teacher 2, UPT1= upper primary teacher 1, UPT2= upper primary teacher 2 M=Mean.

Conducting an observation, as seen in results presented in Table 4, is essential in capturing the authentic assessment practices of primary school science teachers in real-time. This method provides a nuanced understanding of classroom dynamics, allowing researchers to see how assessment tasks are implemented and how immediate feedback is given. It also helps identify discrepancies between reported practices and actual behavior, offering insights into areas needing improvement. By systematically evaluating various pedagogical techniques, such as questioning strategies and the use of higher-order questions, observation provides a comprehensive view of current practices. This detailed, real-time data is invaluable for informing targeted interventions and enhancing educational outcomes in the Effutu Municipality.

Table 4 presents the results of the observation on the assessment practices used by primary school science teachers in the classroom. Using the interpretation scale: 1.00-1.49= strongly Disagree, 1.50-2.49= Disagree, 2.50-3.49= Agree and 3.50-4.00= strongly agree, the analysis of the observation of assessment practices reveals several key insights.

The highest mean score of 3.0 indicates that teachers were effectively designing lessons that allow them to monitor learners' progress, which is a significant strength. However, there are areas needing improvement. The mean score of 1.5 for probing learners' reasoning suggests minimal engagement in exploring students' thought processes. Additionally, the score of 2.0 for providing immediate feedback indicates that while some feedback is given, it is not consistently timely, potentially hindering students' ability to correct mistakes and understand concepts promptly. The questioning strategies used by teachers, with a mean score of 2.25, show some evidence of promoting problem-solving skills, but there is room for more effective use of higher-order questions and addressing misconceptions. Scores of 2.5 for varying assessment tools, peer and self-assessment practices, realistic assessment tasks and incorporating investigative science elements suggest that these practices are somewhat evident but could be strengthened. Overall, while the ability to monitor progress is a clear strength, enhancing the probing of reasoning, providing immediate feedback, and improving questioning strategies,

along with increasing the use of varied and realistic assessment methods, could further improve teaching practices.

H_{01}: There is no significant difference in the kinds of authentic assessment tasks used by public and private primary school science teachers in the Effutu Municipality.

The first hypothesis sought to establish differences in the kinds of authentic assessment tasks used by the public and private primary school science teachers. To test this hypothesis, an independent sample t-test was conducted, comparing the mean scores of authentic assessment tasks between public and private schools. The results obtained are presented in Table 5.

Table 5: Independent Sample T-test of Nature of Schools and Kinds of Authentic Assessment Tasks Used

Nature of School	N	Mean	Std. Dev	T	Df	Sig.
Public	102	24.372	3.94	0.456	178	0.649
Private	78	24.102	3.91			

*$p < 0.05$ level (2-tailed)

The results in Table 5 show a negligible variance in authentic assessment task usage between Public (M=24.37, SD=3.94) and Private (M=24.10, SD=3.91) schools, with a non-significant t-value [t (178) = 0.456, p > 0.05]. This uniformity leads to acceptance of the null hypothesis.

The findings suggest that both public and private primary school science teachers in the Effutu Municipality employed similar authentic assessment tasks. This can be attributed to educational reforms and policies emphasizing authentic assessment, as noted by Koh and Luke (2019). Additionally, similar professional development opportunities for teachers in both school types, as highlighted by Mussawy (2012) and comparable resource availability, as noted by Birenbaum (2014), contribute to this uniformity.

While some literature suggests private schools might have more flexibility and resources (Brandt, 2023), this was not observed in the Effutu Municipality. Overall, the findings underscore the importance of the authentic assessment in fostering a reflective and adaptive teaching environment, supported by effective educational policies and professional development programs across different school settings.

H_{02}: There is no significant difference in the use of authentic assessment results across the educational circuits of schools in the Effutu Municipality.

The second hypothesis investigated whether there is a significant difference in the use of authentic assessment results across the educational circuits of schools in the Effutu Municipality. To address this hypothesis, a one-way ANOVA test (Table 6 and 7) was conducted to compare the mean scores of the use of authentic assessment results among the three educational circuits: Winneba Central, Winneba East, and Winneba West.

Table 6: Group Statistics of Educational Circuits in Terms of Use of Authentic Assessment Results

Group	N	Mean	Standard Deviation	Standard Error
Winneba Central	60	4.25	0.64	0.083
Winneba East	90	4.26	0.61	0.064
Winneba West	30	4.32	0.62	0.112

Table 7: One-Way ANOVA of Educational Circuits of Schools in Terms of Use of Authentic Assessment Results

Group	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.208	2	0.104	1.175	0.183
Within Groups	10.722	177	0.061		
Total	10.929	179			

*$p < 0.05$ level (2-tailed).

The analysis reveals a lack of statistically significant disparities in how authentic assessment results are utilized across the three school categories, as indicated by an F-value of F (2, 177) = 1.175, p = 0.183. Accordingly, this uniform application of the assessment results among educational institutions supports the decision to uphold the null hypothesis. This finding aligns with the literature, suggesting a

consistent approach to assessment practices across different educational circuits, leading to a standardized educational experience that benefits equity in education (Windschitl & Calabrese Barton, 2016). The uniformity in the use of authentic assessment across the three circuits indicates that teachers might have received similar training and professional development, emphasizing the importance of continuous programs focused on authentic assessment (Koh & Luke, 2019). Such assessments promote deeper learning and students' engagement by replicating real-world challenges, fostering critical thinking, problem-solving skills, and practical knowledge application (Villarroel et al., 2018). The findings suggest effective implementation of educational policies promoting authentic assessments, serving as a model for other regions. This uniform use contributes to educational equity by ensuring all students have access to high-quality assessments, helping to identify and address learning gaps effectively (Rusdiyana et al., 2024).

Conclusions and Recommendations
Conclusion
Primary school teachers in the Effutu Municipality engage their pupils in a range of authentic assessment tasks, with a slightly higher emphasis on self-assessment and peer assessment. Authentic assessment results are highly beneficial for developing teaching strategies, aiding learner goal-setting, and designing learning activities. Both public and private school teachers utilized similar authentic assessment tasks. Additionally, schools across the various circuits in the Effutu Municipality consistently applied authentic assessment results.

Recommendations
Based on the findings, it is recommended that professional development for teachers in the Effutu Municipality should focus on enhancing skills in self-assessment and peer assessment through targeted workshops and training sessions. Integrating authentic assessment results into curriculum design and developing goal-setting frameworks can further align teaching strategies with student needs. To ensure uniform implementation across schools, standardized guidelines and collaborative networks should be established, allowing teachers in the Municipality to share experiences and best practices. Additionally, creating a repository of best practices for utilizing assessment results and implementing a system for regular review and feedback will promote consistent application and continuous improvement of authentic assessment practices across the Effutu Municipality.

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