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Teachers' Perception On The Effectiveness Of Objective Tests Versus Essay Tests In Measuring Students' Achievement In Mathematics In Okrika LGA Of Rivers State

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ABSTRACT

This study investigated teachers' perception of the effectiveness of objective tests versus essay tests in measuring students' achievement in Mathematics in Okrika Local Government Area of Rivers State. The study adopted a descriptive research design. The population comprised 24 Mathematics teachers in public secondary schools in Okrika LGA, and a census sampling technique was used to include all the teachers as the sample. Data were collected using a structured questionnaire titled Teachers' Perception of the Effectiveness of Objective and Essay Tests in Measuring Students' Achievement in Mathematics. The instrument was validated by experts and yielded a reliability coefficient of 0.72 using Cronbach's alpha. Mean and standard deviation were used to answer the research questions, while t-test was used to test the hypothesis at 0.05 level of significance. Findings revealed that teachers perceived both objective and essay tests as effective in measuring students' achievement in Mathematics, with essay tests rated slightly higher. However, there was no significant difference in teachers' perception of the effectiveness of objective and essay tests. The study concluded that both assessment formats are complementary in evaluating students' achievement in Mathematics. Based on the findings, it was recommended that Mathematics teachers should adopt a balanced use of objective and essay tests, receive training on effective essay test construction and scoring, and that curriculum planners should strengthen blended assessment approaches in Mathematics education.

Keywords: Teachers' Perception, Objective Tests, Essay Tests, Mathematics Achievement, Assessment, Okrika LGA, Rivers State.

INTRODUCTION

Assessment plays a vital role in modern education systems. It is not only used for grading students, but also serves as an important means of improving teaching and learning, as well as informing policy decisions. Globally, assessment is recognized as a source of evidence on what learners know and are able to do, which in turn guides instructional planning, curriculum development, and the allocation of educational resources (UNESCO, 2024). In the same vein, the Organisation for Economic Co-operation and Development notes that assessment, especially when used formatively, significantly enhances students' academic achievement and the effectiveness of teaching (OECD, 2023). Recent studies have also shown that what is assessed in the classroom to a large extent determines what teachers teach and

how they teach it (Foster & Piacentini, 2023). This indicates that assessment is not a peripheral aspect of education, but a central factor that shapes teaching methods and learning outcomes.

In Mathematics education, assessment presents a more complex challenge due to the nature of the subject. Mathematical competence involves both procedural skills and conceptual understanding, making it difficult for a single assessment method to adequately measure students' abilities. Scholars have emphasized that effective assessment in Mathematics should address different levels of cognitive demand, including recall, routine procedures, and higher level reasoning and problem solving (Hoffman & Wine, 2023; National Council of Teachers of Mathematics, 2020). This creates a challenge in selecting appropriate assessment methods, as different test formats are better suited to assessing different aspects of learning. Objective test items, for example, are useful for measuring factual knowledge, while essay type questions are more effective in assessing students' reasoning, explanation, and depth of understanding.

This situation has given rise to a long standing debate in educational measurement on the relative effectiveness of objective and essay tests. Objective tests, such as multiple choice questions, are widely accepted because they ensure objectivity in scoring, high reliability, and wide coverage of content (Brookhart, 2024). However, they are often criticized for their limited ability to measure higher order thinking and problem solving skills. On the other hand, essay tests provide students with the opportunity to organize their thoughts, demonstrate reasoning, and show depth of understanding. Despite these advantages, essay tests are often associated with subjectivity in scoring and limited coverage of content (Haladyna & Rodriguez, 2013). As a result, there is still no general agreement on which test format is more effective, particularly in Mathematics where both accuracy and explanation are important.

In Nigeria, assessment practices in secondary schools are largely influenced by national examination bodies such as the West African Examinations Council and the National Examinations Council. These bodies make use of both objective and essay test formats in assessing students' performance in Mathematics, suggesting that both approaches have their relevance. However, there have been consistent reports of poor performance in Mathematics among secondary school students, which has raised concerns about the effectiveness of existing assessment practices (Federal Ministry of Education, 2021; UBEC, 2022).

In Rivers State, similar concerns have been raised about students' achievement in Mathematics, leading to increased attention on both teaching and assessment practices. Despite this, there is limited empirical evidence on how teachers in specific areas, such as Okrika Local Government Area, perceive the effectiveness of different test formats. Since teachers are directly responsible for classroom assessment, their perceptions influence the choice and use of assessment methods. The lack of studies in Okrika LGA therefore creates a gap in knowledge, particularly in understanding whether teachers consider objective tests or essay tests to be more effective in assessing students' achievement in Mathematics.

It is against this backdrop that this study is focused on teachers' perception of the effectiveness of objective and essay tests in this context. Without such evidence, attempts to improve students' performance in Mathematics may fail to address an important aspect of teaching and learning, which is the appropriateness of assessment methods. This study is therefore necessary as it seeks to provide empirical evidence on teachers' assessment preferences and how these relate to the measurement of students' achievement in Mathematics in Okrika LGA of Rivers State.

Statement of the Problem

In a well-structured educational system, assessment is expected to function as a valid and reliable means of determining the extent to which learning objectives have been attained. In Mathematics education, effective assessment should capture reasoning ability, problem solving skills, and conceptual understanding. The quality of any assessment is judged by how well its instruments align with intended learning outcomes and reflect the cognitive demands of the subject (Brookhart, 2024; NCTM, 2020). Objective and essay tests are expected to complement each other. However, there is an ongoing debate regarding their adequacy. Objective tests offer high reliability, ease of scoring, and broad content coverage, but are criticized for limited capacity to assess higher order cognitive skills. Essay tests assess reasoning, problem solving, and depth of understanding, but face subjectivity and inconsistencies in marking (Haladyna & Rodriguez, 2018). Empirical findings on superiority remain inconclusive (Black &

Wiliam, 2018). In Nigeria, persistent poor performance in Mathematics attracts attention, with WAEC (2023) reporting fluctuating low pass rates. Teachers determine test instruments, but it is unclear whether their reliance on objective and essay tests is informed by pedagogical considerations, examination requirements, or convenience. A gap exists in localized empirical studies within Okrika LGA of Rivers State. Thus, this study investigates teachers' perceptions of the effectiveness of objective and essay tests in measuring students' achievement in Mathematics in Okrika LGA, to generate empirical evidence for improving assessment practices and policy.

Purpose of the Study

The main purpose of this study was to investigate teachers' perception on the effectiveness of objective tests versus essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State. Specifically, the objectives of the study were to:

1. Examine teachers' perception of the effectiveness of objective tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State.
2. Examine teachers' perception of the effectiveness of essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State.
3. Compare teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State.

Research Questions

1. What is the level of teachers' perception of the effectiveness of objective tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State?
2. What is the level of teachers' perception of the effectiveness of essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State?
3. What is the difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State?

Hypotheses

1. There is no significant difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State.

Review of Related Literature

Concept of Assessment in Education

Assessment in education refers to the systematic process of collecting, interpreting, and using evidence of students' learning in order to make informed judgments about their achievement and to improve the teaching-learning process. It goes beyond mere testing, as it involves a range of procedures designed to determine the extent to which intended learning outcomes have been achieved across the cognitive, affective, and psychomotor domains (Brookhart, 2024). Contemporary literature further positions assessment as an essential component of the teaching and learning process, rather than an activity carried out at the end of instruction (Popham & Popham, 2024). In this regard, three major forms of assessment are commonly identified: assessment of learning (summative assessment), assessment for learning (formative assessment), and assessment as learning, which emphasizes learners' self-monitoring and reflection on their own progress (Black & Wiliam, 2018; Earl, 2012). These forms underscore both the evaluative and developmental roles of assessment within the educational process.

Assessment also serves several key purposes, including diagnostic, formative, summative, and evaluative functions. Diagnostic assessment is used to identify learners' prior knowledge and learning difficulties, while formative assessment provides ongoing feedback to support learning during instruction. Summative assessment is used to determine achievement at the end of an instructional period, and evaluative assessment focuses on making judgments about the effectiveness of educational programmes or institutions (Brookhart, 2024; Popham & Popham 2024).

A fundamental requirement of effective educational assessment is that it must demonstrate validity and reliability. Validity refers to the extent to which an assessment measures what it is intended to measure, while reliability refers to the consistency of assessment results over time and across different contexts. Although both are important, validity is generally considered the primary concern, with reliability serving

as a necessary condition for meaningful interpretation of assessment outcomes (Brookhart, 2017). In the absence of validity and reliability, assessment results may be misleading and unsuitable for educational decision making.

Assessment in Mathematics Education

Assessment in Mathematics education is inherently complex because it is expected to capture multiple dimensions of learning that go beyond factual recall. These include procedural fluency, conceptual understanding, problem solving ability, and mathematical reasoning. Peters (2024) conceptualize mathematical proficiency as a multidimensional construct comprising conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition. This perspective underscores the challenge of Mathematics assessment, as it is difficult for any single assessment task or format to adequately measure all these components.

Measuring achievement in Mathematics also differs significantly from subjects that are largely descriptive or based on memorization. In Mathematics, achievement is not only reflected in arriving at correct answers, but also in the ability to demonstrate and communicate the reasoning processes used in obtaining those answers. The National Council of Teachers of Mathematics emphasizes that effective assessment should provide clear evidence of both conceptual understanding and the ability to apply mathematical processes in solving problems (NCTM, 2014). In this sense, assessment tasks are expected to elicit students' thinking processes rather than focusing solely on final answers. The dual nature of mathematical knowledge, that is, its procedural and conceptual components, further complicates assessment design. Webb's Depth of Knowledge framework highlights the varying levels of cognitive demand in learning tasks, ranging from simple recall to strategic thinking and extended reasoning (Hoffman & Wine, 2023). Similarly, Liu and Chen (2024) argues that effective Mathematics assessment should extend beyond routine computation to include explanation, justification, and interpretation of mathematical ideas. However, not all assessment formats are equally effective in capturing these different dimensions. Objective test items are generally effective in assessing computational skills and basic conceptual recognition, but they are limited in their ability to capture reasoning processes. In contrast, essay and other open ended formats are more capable of eliciting explanations and demonstrating reasoning, although they present challenges related to scoring consistency and time demands.

Objective Tests

Objective tests refer to any written test that requires the examinee to select the correct answer from among one or more of several alternatives or supply a word or two. Scoring is guided by clearly defined answers, they tend to produce consistent results irrespective of the examiner involved (Haladyna & Rodriguez, 2018). This characteristic makes them particularly useful in large scale assessment settings where standardization and objectivity are essential. These tests are commonly presented in formats such as multiple choice, true or false, matching, and fill in the blank, with multiple choice items being the most widely used due to their versatility and ease of construction. In Nigeria, objective test items are heavily utilized in standardized examinations conducted by bodies such as the West African Examinations Council (WAEC) and the National Examinations Council (NECO), including in Mathematics assessment. One of the major strengths of objective tests is their ability to cover a wide range of content within a relatively short time. They are also easy to score, highly objective, and generally yield reliable results. Tarrant and Ware (2018) further notes that they minimize scorer bias and enhance scoring consistency across large populations of candidates. Despite these advantages, objective tests have notable limitations. They are often constrained in their ability to assess higher order cognitive skills such as reasoning, justification, and the process of problem solving. In addition, they are susceptible to guessing, which may distort students' true performance levels. (Haladyna & Rodriguez, 2018) also observe that such tests frequently fail to capture the reasoning processes underlying students' responses, particularly in subjects like Mathematics where explanation is as important as the final answer. Empirical evidence on the effectiveness of objective tests presents mixed findings. While some studies suggest a strong correlation between objective test scores and overall achievement due to their reliability and broad sampling of content, others argue that they tend to underestimate students' conceptual understanding and reasoning ability when used in isolation. In Nigeria, Nworgu (2015) acknowledges the widespread reliance on

objective testing while also raising concerns about its inadequacy in fully capturing mathematical reasoning and problem solving skills.

Essay Tests

Essay tests are assessment instruments that require learners to construct their responses in their own words, thereby allowing them to demonstrate depth of understanding, reasoning ability, and clarity in the expression of ideas. Unlike objective tests, essay tests are open ended and flexible, which makes their scoring dependent on the professional judgment of the examiner. Alkhateeb & Al-Duwairi (2024) noted that essay tests are particularly appropriate for measuring complex learning outcomes such as explanation, analysis, and synthesis, which cannot be adequately assessed using fixed response formats. Essay questions are generally classified into extended response and restricted response types. Extended response items give learners considerable freedom to organize and present their ideas, often drawing on knowledge from different areas, while restricted response items limit the scope of the answer but still require students to construct their responses (Mertler, 2016). In Mathematics education, both forms are commonly used to obtain detailed solutions and to assess how well students can justify their problem solving processes.

One of the major strengths of essay tests lies in their capacity to assess higher order cognitive skills, including reasoning, logical thinking, and step by step problem solving. They provide more detailed evidence of students' understanding by showing how learners arrive at their answers and how effectively they communicate mathematical ideas (Mahmun & Mohd, 2019). However, essay tests are not without limitations. Issues such as subjectivity in scoring can affect reliability, especially when marking criteria are not clearly defined. In addition, they tend to cover a limited range of content due to time constraints, and they require more time for both administration and marking (Mertler, 2016). Empirical studies suggest that although essay tests are effective in measuring reasoning and problem solving, their reliability largely depends on the use of well-structured scoring rubrics and adequate training of examiners (Brookhart, 2024). For this reason, many assessment systems adopt a combination of essay and objective test formats in order to achieve a balance between depth of understanding, reliability, and efficiency in assessment.

Teachers' Perception of Assessment in Mathematics Education

Teachers' perception of assessment significantly shapes how assessment is conceptualized and implemented in Mathematics classrooms. Teachers influence both the choice of assessment methods and how assessment results are interpreted for instructional improvement. In the Nigerian context, Mathematics teachers often hold mixed perceptions of instructional and assessment practices, recognizing their importance for improving teaching (Asanre et al., 2024), although practice tends to favour summative testing over formative approaches. Studies show that many teachers have limited assessment competence, particularly in designing and implementing effective assessment practices (Babatimehin et al., 2025). Consequently, classroom assessment often emphasizes recall and routine exercises rather than higher order thinking, reflecting a general tendency to prioritize grading over learning improvement. External examination bodies such as WAEC, NECO, and BECE play a significant role in shaping teaching and assessment practices in Nigerian secondary schools, as they often determine the direction of instruction and influence the quality of classroom assessment (Emelogu et al., 2021). This promotes an exam oriented approach to assessment. However, there is limited empirical evidence specific to Okrika LGA, creating a contextual gap that necessitates further investigation into teachers' perceptions of assessment in Mathematics within the area.

Classical Test Theory

Classical Test Theory (CTT), originally proposed by Charles Spearman (1904) and later developed by Lee Cronbach (1951), provides a foundational framework in educational measurement. The theory assumes that every observed test score is composed of a true score and an error component, commonly expressed as: observed score equals true score plus error. The true score represents the actual level of a learner's ability, while the error component reflects various factors that may distort measurement, such as testing conditions, item ambiguity, or inconsistencies in scoring. Within this framework, reliability and validity are central criteria for evaluating the quality of any assessment instrument. Reliability refers to the consistency of test scores across repeated administrations or equivalent forms, while validity refers to

the extent to which an instrument accurately measures the construct it is intended to measure. Accordingly, a sound assessment tool is one that minimizes measurement error and yields consistent and accurate representations of learners' achievement. CTT is particularly relevant to the present study as it provides a conceptual basis for comparing objective and essay test formats in terms of their measurement effectiveness. Objective tests are generally associated with higher reliability due to their standardized scoring procedures, which reduce scorer variability. In contrast, essay tests are often considered stronger in terms of validity, especially in contexts such as Mathematics where assessment of reasoning, problem solving, and conceptual understanding is essential. Thus, Classical Test Theory offers a useful lens for explaining variations in teachers' perceptions regarding the effectiveness of different test formats in measuring students' achievement in Mathematics.

METHODOLOGY

This study adopted a descriptive research design. The study was carried out in Okrika Local Government Area of Rivers State. The population of the study comprised all Mathematics teachers in public senior secondary schools in Okrika LGA. The total population consisted of twenty four (24) Mathematics teachers. Due to the manageable size of the population, a census sampling technique was adopted, whereby all members of the population were used as the sample. Therefore, the sample size for the study was twenty four Mathematics teachers. The instrument used for data collection was a structured questionnaire titled Teachers' Perception of the Effectiveness of Objective and Essay Tests in Measuring Students' Achievement in Mathematics Questionnaire (TPEOETMSAMQ). The instrument was validated by experts in educational measurement and evaluation to ensure clarity, relevance, and appropriateness of the items. To determine the reliability of the instrument, a pilot test was conducted and the data obtained were analyzed using Cronbach's alpha reliability method, which yielded a reliability coefficient of 0.72. Data collected were analyzed using descriptive and inferential statistics. Mean and standard deviation were used to answer the research questions, while t-test was used to test the hypothesis at a 0.05 level of significance.

RESULTS

Answers to Research Questions

Research Question 1: *What is the level of teachers' perception of the effectiveness of objective tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State?*

Table 1: Summary of Descriptive (Mean & SD) on the level of Teachers' Perception of the Effectiveness of Objective Tests in measuring Students' Achievement in Mathematics in Okrika LGA of Rivers State

| Objective Tests | VHL | HL | LL | VLL | Mean | SD | Remark |
|--|------------|-----------|-----------|------------|-------------|-------------|-------------------|
| 1 Objective tests adequately cover a wide range of Mathematics topics in a single assessment. | 13 | 5 | 4 | 2 | 3.33 | 0.48 | High Level |
| 2 Objective tests provide consistent and reliable scores that reflect students' true achievement in Mathematics. | 15 | 7 | 2 | 0 | 3.29 | 0.46 | High Level |
| 3 Objective tests effectively measure students' ability to recall and apply mathematical facts and procedures. | 14 | 6 | 2 | 2 | 3.21 | 0.41 | High Level |
| 4 Objective tests are effective in assessing students' higher-order mathematical thinking and reasoning. | 10 | 7 | 5 | 2 | 3.04 | 0.46 | High Level |
| 5 Objective tests provide results that can be used to make valid judgements about students' overall Mathematics achievement. | 18 | 5 | 1 | 0 | 3.21 | 0.41 | High Level |
| Grand Total | | | | | 3.22 | 0.45 | High Level |

The data in table 1 shows that the level of teachers' perception of the effectiveness of objective tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State is high (Mean=3.22, SD=0.45). The table further revealed that teachers agreed that objective tests adequately cover a wide range of Mathematics topics in a single assessment (Mean=3.33, SD=0.48), provide consistent and reliable scores that reflect students' true achievement in Mathematics (Mean=3.29, SD=0.46), effectively measure students' ability to recall and apply mathematical facts and procedures (Mean=3.21, SD=0.41), are effective in assessing students' higher-order mathematical thinking and reasoning (Mean=3.04, SD=0.46) and provide results that can be used to make valid judgements about students' overall Mathematics achievement (Mean=3.21, SD=0.41).

Research Question 2: *What is the level of teachers' perception of the effectiveness of essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State?*

Table 2: Summary of Descriptive (Mean & SD) on the level of Teachers' Perception of the Effectiveness of Essay Tests in measuring Students' Achievement in Mathematics in Okrika LGA of Rivers State

| Essay Tests | VHL | HL | LL | VLL | Mean | SD | Remark |
|---|-----|----|----|-----|-------------|-------------|-------------------|
| 6 Essay tests effectively assess students' ability to demonstrate mathematical reasoning and problem-solving processes. | 18 | 3 | 2 | 1 | 3.58 | 0.20 | High Level |
| 7 Essay tests provide an accurate reflection of students' depth of understanding of mathematical concepts. | 17 | 7 | 0 | 0 | 3.71 | 0.46 | High Level |
| 8 Essay tests allow students to communicate their mathematical thinking in ways that objective tests cannot capture. | 16 | 6 | 2 | 0 | 3.50 | 0.44 | High Level |
| 9 The marking of essay tests is objective enough to ensure reliable measurement of students' Mathematics achievement. | 17 | 7 | 0 | 0 | 3.71 | 0.46 | High Level |
| 10 Essay tests are effective tools for measuring students' achievement across different levels of mathematical ability. | 20 | 2 | 2 | 0 | 3.75 | 0.28 | High Level |
| Grand Total | | | | | 3.65 | 0.37 | High Level |

The data in table 2 shows that the level of teachers' perception of the effectiveness of essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State is high (Mean=3.65, SD=0.37). The table further shows that teachers agreed that essay tests effectively assess students' ability to demonstrate mathematical reasoning and problem-solving processes (Mean=3.58, SD=0.20), provide an accurate reflection of students' depth of understanding of mathematical concepts (Mean=3.71, SD=0.46), allow students to communicate their mathematical thinking in ways that objective tests cannot capture (Mean=3.50, SD=0.44), are effective tools for measuring students' achievement across different levels of mathematical ability (Mean=3.75, SD=0.28) and the marking of essay tests is objective enough to ensure reliable measurement of students' Mathematics achievement (Mean=3.71, SD=0.46).

Research Question 3: *What is the difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State?*

Table 3: Summary of Descriptive (Mean & SD) on the Difference in Teachers' Perception of the Effectiveness of Objective Tests and Essay Tests in measuring Students' Achievement in Mathematics in Okrika LGA of Rivers State

| Test | N | M | SD |
|-------------------|----|-------------|-------------|
| Objective Test | 24 | 3.22 | 0.37 |
| Essay Test | 24 | 3.65 | 0.45 |
| Difference | | 0.43 | 0.08 |

The data in table 3 shows the difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State is 0.43 (SD=0.08). This shows that essay tests are perceived higher by teachers compared to objective tests in measuring students' achievement in Mathematics.

Testing of Hypotheses

HO₁: There is no significant difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State.

Table 4: Summary of t-test on the difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State

| Test | N | Mean | SD | Df | t-test | Sig. | Remark |
|------------------|----|------|------|----|--------|-------|--------|
| Objective | 24 | 3.22 | 0.37 | 23 | 1.141 | 0.266 | NS |
| Essay | 24 | 3.65 | 0.45 | | | | |

The table above showed the difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State. The mean perception for objective tests is 3.22 and the standard deviation is 0.37, while the mean perception for essay tests is 3.65 and the standard deviation is 0.45. The t-test calculated value is 1.141, the corresponded significance value is 0.266 showing > 0.05 at 670 degrees of freedom. Hence, it is concluded that there is no significant difference in teachers' perception of the effectiveness of objective tests and essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State. Hence, the null hypothesis one is retained at 0.05 level of significance.

DISCUSSION OF FINDINGS

Teachers' Perception of the Effectiveness of Objective Tests in measuring Students' Achievement in Mathematics in Okrika LGA of Rivers State

The result presented in table 1 that teachers in Okrika LGA perceive objective tests as highly effective in measuring students' achievement in Mathematics reflects a strong preference for structured and standardized assessment formats in classroom practice. This perception is consistent with contemporary assessment literature, which highlights objective tests for their efficiency, standardization, and ability to provide consistent measurement across a wide range of content areas (Haladyna & Rodriguez, 2013). The generally positive ratings from teachers therefore suggest that objective tests are seen as practically suitable for covering extensive Mathematics syllabi within the constraints of instructional time. The item level results further indicate that teachers associate objective tests with reliable and valid measurement of

students' procedural knowledge and factual recall in Mathematics. This finding aligns with global perspectives on educational assessment, which recognize standardized formats such as multiple choice and other objective items as important tools in large scale measurement due to their high reliability and scoring objectivity (Organisation for Economic Co-operation and Development, 2023). Nonetheless, the comparatively lower perception of objective tests in assessing higher order mathematical reasoning reflects a persistent concern in Mathematics education. Specifically, such formats are often considered insufficient for capturing complex cognitive processes that underpin deep conceptual understanding and effective problem solving (National Council of Teachers of Mathematics, 2020).

Teachers' Perception of the Effectiveness of Essay Tests in measuring Students' Achievement in Mathematics in Okrika LGA of Rivers State

The result in Table 2 shows that teachers in Okrika LGA perceive essay tests as highly effective in measuring students' achievement in Mathematics, indicating strong recognition of constructed response assessment in capturing deeper learning outcomes. This aligns with the National Council of Teachers of Mathematics (2020), which emphasizes that effective Mathematics assessment should go beyond procedural accuracy to include reasoning, justification, and communication of ideas. The item level results further reveal that teachers strongly agree that essay tests assess mathematical reasoning, problem solving processes, and depth of conceptual understanding. This supports the view of the Organisation for Economic Co operation and Development (2023) that higher order cognitive skills are better measured through tasks requiring students to construct and explain responses rather than select options. Teachers also perceive essay tests as effective in allowing students to communicate their mathematical thinking and in differentiating across ability levels. However, the relatively high agreement that essay tests can be marked objectively highlights concerns about scoring consistency, reinforcing the importance of structured rubrics to improve reliability (Brookhart, 2024). Overall, the findings suggest that while essay tests are valued for assessing higher order thinking, attention to scoring reliability remains important.

Teachers' Perception of the Effectiveness of Objective Tests and Essay Tests in measuring Students' Achievement in Mathematics in Okrika LGA of Rivers State

The result presented in Table 3 indicates that although teachers rated essay tests higher than objective tests, the observed difference in their perception is not statistically significant. This implies that teachers in Okrika LGA generally regard both assessment formats as effective tools for measuring students' achievement in Mathematics, with only a slight inclination toward essay tests in terms of perceived effectiveness. The finding therefore reflects a broadly balanced perception of both test types rather than a strong preference for one over the other. The lack of a statistically significant difference is consistent with the position that effective Mathematics assessment requires the use of multiple assessment formats to adequately capture the diverse dimensions of learning. The Organisation for Economic Co-operation and Development (2023) notes that no single assessment approach is sufficient for measuring the full range of cognitive skills in complex subjects such as Mathematics, as both structured response and constructed response items contribute in different but complementary ways to evidence of learning. In the same direction, the National Council of Teachers of Mathematics (2020) advocates for the integration of varied assessment methods in order to adequately assess procedural fluency, reasoning, and conceptual understanding. Overall, the findings suggest that teachers in the study area recognize the complementary roles of objective and essay tests in Mathematics assessment. Rather than viewing them as competing or mutually exclusive, both formats are perceived as useful instruments for capturing different aspects of students' achievement in Mathematics.

CONCLUSION

This study examined teachers' perception of the effectiveness of objective tests versus essay tests in measuring students' achievement in Mathematics in Okrika LGA of Rivers State. The findings revealed that teachers generally perceive both objective and essay test formats as effective assessment tools, with essay tests rated slightly higher in terms of their ability to measure reasoning, problem solving, and conceptual understanding. However, the difference in perception between the two test formats was not statistically significant, indicating that teachers value both forms of assessment almost equally. Overall,

the study concludes that objective and essay tests are perceived as complementary rather than competing tools in Mathematics assessment, each contributing differently to the measurement of students' achievement.

RECOMMENDATIONS

Based on the findings, the researcher recommends the following:

1. Mathematics teachers in Okrika LGA should adopt a balanced assessment approach that integrates both objective and essay test formats to ensure comprehensive measurement of students' procedural knowledge and higher order thinking skills.
2. School administrators and educational authorities should provide regular professional development training for Mathematics teachers on effective construction and scoring of essay tests using standardized rubrics to enhance reliability and consistency in assessment.
3. Curriculum planners and policymakers should strengthen assessment guidelines in Mathematics by explicitly promoting the use of blended assessment strategies that align with both national examination standards and competency based learning objectives.

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