

TEACHERS' ASSESSMENT COMPETENCIES IN BASIC SCIENCE AND STUDENTS' LEARNING OUTCOMES IN PUBLIC SECONDARY SCHOOLS IN OBIO-AKPOR LOCAL GOVERNMENT AREA, RIVERS STATE.

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Abstract

This study investigated teachers' assessment competencies in basic science and students' learning outcomes in public secondary schools in Obio-Akpor Local Government Area, Rivers State. The population for the study comprised all the public Secondary school basic science teachers in Obio-Akpor Local Government Area. which was estimated to be 695 teachers. A sample size of two hundred (200) Basic science teachers was selected using stratified random sampling techniques and Taro Yamane formula. Descriptive survey research design was used for this study. Two (2) research questions and a hypothesis were formulated to guide the study. A structured questionnaire titled "Teachers Competencies for Proper Assessment (TCPA)" with a four (4) point Likert scale was developed by the researchers and was validated by experts from Educational Measurement & Evaluation in the Department of Educational Psychology, Guidance and Counselling of the Ignatius Ajuru University of Education, Rivers State. A reliability coefficient of 0.83 was obtained using the Cronbach Alpha reliability test. Mean and standard deviation were used to answer the research questions while the independent samples t-test was employed to test the hypothesis with the aid of SPSS software. The researchers observed that non-usage of standardized assessment instruments, lack of motivational skills, level of teachers' competencies on assessment skills are some of the challenges for proper assessment of students learning outcomes in schools. It was recommended that teachers should be compelled to use standardized instruments like tests, and questionnaires for comparison. Also trainings, conferences, workshops should be organized for more professional development of the teachers.

Keywords: Assessment, Competencies, Standardized, Learning outcomes

Introduction

Inclusive Assessment is vital to educational practices and policies since it influences the ways the goals and objectives of education are achieved. Reports on students' educational assessment, contribute facts on their educational progress and show the peculiarity of any instructional processes that take place in a learning environment' (Obioma, Junaidu, & Ajagun, 2013). Asuru (2015) noted that assessment is a process of arranging quantitative data in such a way that it would be interpreted easily and some decisions made from it. The data gotten comprise information from the cognitive, psychomotor and affective domains. Ukwuije and Opara (2012) explained that, 'when assessment is incorporated into the process of teaching and learning, it becomes holistic term that encompasses all the circumstances in which some aspects of a child's education are determined by the teacher. It is also a reflection of the degree of success of the teacher's instructional practices'.

Assessment, according to Okoro in Ifeanyi and Aneke (2013), means an evaluation that uses the data collected to establish the programme quality. The National Teachers Institute (NTI) in the same book stated that assessment is seen in various ways such as establishing and organizing test data obtained from examinations or tests, questionnaires and observations into explanatory forms on some factors that include many techniques to determine achievement in the cognitive, psychomotor and affective domains.

Classroom assessment is beneficial for it gives an instant measure of students' progress and performance outcomes; directs and enhances teaching and learning activities and discovers the extent to which a student is conversant with topic. The process of assessment is included in various decisions made in the classroom. It is also one of the ways of giving information to students. Teachers are, therefore, expected to be knowledgeable in conducting assessment and feedback from assessment during teaching.

An increase in the teachers' level of awareness of their students' achievements will give a clearer picture of student's 'problems during the instructional process as teachers may discover the origin of their learning problems. For this reason, it is important to know how assessment is used and the skills involved in it. Lack of assessment skills may lead to a false understanding of learners' ability and hinder them from reaching their desired academic heights (Stiggins, 2001).

Educational assessment is faced with the following challenges:

- Non – usage of standardized instruments in assessment: Standardization is the system of developing standards based on a particular criterion. Assessment instruments such as tests, questionnaires, inventories, etc. can be standardized to have a uniform result. A standardized test requires that all the testees answer the same questions under uniform directions and time limit, with a standard reference group to which the performance can be compared. (Asuru, 2015).

There are various standardized instruments which can be used in assessing students in the course of teaching and learning. It could be in the form of tests, questionnaires. A standardized instrument has its psychometric properties tested. It ensures that the academic level of students in different skills or subject areas is compared to standards already in existence. This will necessitate constant review of the curriculum especially when there is a decrease in the performance of the testees.

The classroom teachers assessment instruments used in secondary schools are teacher made tests. They are not standardized as they do not follow the procedures of test construction and standardization. Such procedures include the use of test blue print, item writing, trial testing, item analysis, validity and reliability. Teachers give tests randomly without checking their psychometric properties. Some teacher made tests are not marked and scored hence, the essence of such assessment instruments is lost.

- Another major challenge in our public secondary schools is lack of teachers' motivation in the conduct of students' assessment. Such motivation can be in form of incentives such as examination allowances, marking bonuses, etc. This can facilitate the achievement of set and expected goals during the assessment. Although, some teachers naturally are eager to work while others expect to be motivated from time to time. Adequate motivation of teachers will encourage them to put in their best especially during students' assessment.
- Motivation is an internal condition that activates behaviour, gives it direction and influences the desires of an individual. It entails being fully ready to react to numerous problems due to an outcome of emotional perceptions and situational inputs. When self-motivation is well built in an individual, it brings about holistic influence in one's life and even to some rational skills which are more beneficial to one's personality. Tella (2007) stated that when instructors show care, support and lay emphasis on the instructional activities over achievement in terms of scores, students are inspired to attain their desired outcomes and expect success. This is often seen as a result of teachers' feedback. Adepoju (2015) conducted a study to examine the role of relationship among motivational variables and the academic achievement of students in the Secondary School Certificate Examination (SSCE) in Oyo State, Nigeria and found that the availability of instructional materials and the provision of favourable learning environment are the most effective variables for motivating students to learn.

Other assessment challenges recorded in our public secondary schools are:

- lack of competencies by the teachers in carrying out assessment effectively.
- lack of resources to carry out assessment e.g. textbooks, duplicating papers, photocopier, printers and electricity.
- teachers' greater use of end-of-term assessment more than continuous assessment

- Teachers tailor assessment towards public examinations instead of mastery and skills development.
- Instructors usually dwell on the first level of taxonomy in educational objectives during teaching.
- Large class size and lack of motivation for teachers give rise to problems in assessment practices.

These challenges pose a threat to achieving quality students' assessment in our public secondary schools.

Oyedepi (2016) examined the origin of assessment in Nigerian secondary schools, the problems encountered in the conventional paper-and-pencil assessment and the potentials in the use of computer and other ICT skills in assessment in secondary schools in Nigeria. He suggested that the problems could be tackled by allocating funds for developing ICT centres in both federal and state secondary schools. ICT education has to be made mandatory in all educational levels in the country. He also stated that teachers and school managers should be given regular seminars and workshops on how to incorporate ICTs in schools.

Students learning outcomes describe what students are supposed to have learnt as a result of instructional activities that they have been subjected to in a programme. It focuses on the ability of students, their acquired skills and knowledge gained. This study was based on the students' learning outcomes in basic science.

Basic science, which is taught in the junior secondary schools serves as the foundation for the learning of science subjects like physics, chemistry and biology. Basic science is studied in order to expose students to the basic workings of science. It also provides learners with the necessary foundation upon which subsequent learning of science is built. Some of the objectives of basic science include:

- (a) provision of trained manpower in the applied science, technology at the sub-professional level.
- (b) stimulating interest in science.
- (c) endowing individuals with tools for learning, problem solving, analytical thinking and rational thinking.
- (d) providing opportunities for education at higher levels.

Attainment of these objectives will be evident in the kind of outcomes that are obtained. South Eastern Regional Vision for Education (SERVE) conducted a study on the impact of the basic science programme on students in Nigeria and reported that the basic science programme improved students' achievements in the science subjects. They also reported that basic science students performed better than non-basic science students in processing skills, hence, there was a greater interest in the basic science class. (SERVE, 2016). The assessment of the students' learning outcomes in basic science provides

information that puts students learning of the course at the forefront of academic planning as regards the sciences.

The main problem of this research was to investigate teachers' assessment competencies in basic science and students' learning outcomes in public secondary schools in Obio-Akpor Local Government Area, Rivers State.

Research Question

The following research questions were raised to guide the study:

1. How competent are public secondary school teachers in assessing students learning outcomes in basic science?
2. To what extent does lack of teachers' competency for proper assessment influence basic science students' learning outcomes?

Research Hypothesis

There is no significant difference in the competencies of male and female teachers in assessing students learning outcomes of basic science.

Methods

The study employed the descriptive survey research design. A sample of two hundred (200) basic science teachers were selected using Taro Yamane and stratified random sampling technique from the 695 estimated population of all public secondary school basic science teachers in Obio – Akpor Local Government Area. The instrument used to collect data for this study was designed by the researchers and titled 'Teachers Competencies for Proper Assessment Questionnaire (TCPAQ)'. The instrument consisted of two sections: Section A and B. Section A sought demographic information about the teachers. Section B elicited information on the competencies required of teachers for proper assessment of basic science students' learning outcome. The instrument was scored on a 4-point Likert scale of 'very high extent, high extent, low extent and very low extent, and also strongly agree, agree, disagree and strongly disagree'. It was validated by three experts from Educational Measurement and Evaluation in the Department of Educational Psychology, Guidance and Counselling of the Ignatius Ajuru University of Education, Rivers State. A reliability coefficient of 0.83 was obtained using Cronbach Alpha reliability test showing that the instrument is reliable for use in the study. The instrument was administered by the researchers with the help of a research assistant. A total of 200 of TCPAQ were given out and retrieved. Mean and standard deviation were used to answer the research questions while the independent samples t-test was used to test the hypothesis at 0.05 level of significance, with the use of SPSS software.

Results

Research Question 1: How competent are public secondary school teachers in assessing students learning outcomes in basic science?

Table 1: The Mean and Standard Deviation on how Competent Public Secondary School Teachers Are in Assessing Students Learning Outcomes in Basic Science

S/N	STATEMENT	N	MEAN	S.D.	DECISION
1.	The instruments used by teachers in assessing the students lacked high quality items.	200	3.35	0.86	High Extent
2.	They lacked the rigors of instrument developmental processes.	200	3.45	0.91	High Extent
3.	Lacked reliability.	200	3.13	0.94	High Extent
4.	Lacked validity.	200	3.15	0.94	High Extent
5.	Lacked uniformity in the scoring, administering and the interpretation of results.	200	2.96	0.98	High Extent
6.	The instruments are not processed and universalized for all situations and all purposes.	200	2.73	1.02	High Extent

Table 1 shows that all the statements had a mean which is above the criterion mean of 2.50 and signifies high extent. This is an indication that the teachers agreed that public secondary school teachers are not competent in using standardized instruments to assess students learning outcomes in basic science. This is because the instruments they use for assessment lacked validity, reliability, uniformity.

Research Question 2: To what extent does lack of teachers' competencies for proper assessment influence basic science students learning outcomes?

Table 2: The Mean and Standard Deviation of Respondents on the Extent Teachers' Competencies for Proper Assessment Influence Basic Science Students Learning Outcomes

S/N	STATEMENT	N	MEAN	S.D.	DECISION
7.	Ability to construct multiple choice questions.	200	2.88	0.91	Agree
8.	Ability to develop marking scheme/guide	200	2.74	0.91	Agree
9.	Ability to essay type of questions	200	2.61	0.96	Agree
10.	Ability to effectively use appropriate statistics for analyzing assessment data.	200	2.63	1.05	Agree
11.	Ability to administer, score and interpret assessment results.	200	2.86	0.98	Agree
12.	Ability to develop valid students grading procedures.	200	2.51	0.97	Agree
13.	Ability to interpret the test norms.	200	2.78	0.91	Agree
14.	Ability to use assessment as a feedback mechanism.	200	2.90	0.90	Agree
15.	Ability to observe and record important incidents of students' behaviour.	200	2.68	0.98	Agree
16.	Ability to use assessment scores to improve teaching.	200	2.62	0.92	Agree
17.	Ability to interpret standardized test scores.	200	2.62	0.92	Agree
18.	Ability to develop test blue prints for test plan.	200	2.50	0.97	Agree
19.	Ability to conduct item analysis.	200	2.58	0.95	Agree
20.	Ability to develop a rating scale for the students behaviour	200	2.53	0.99	Agree
21.	Ability to use peer assessment	200	2.61	0.96	Agree
22.	Ability to provide the students with a feedback on their performance.	200	3.05	0.87	Agree
23.	Ability to provide the parents with a progressive report on their ward's performance.	200	3.10	0.75	Agree

Table 2 shows the responses of the teachers on the competencies required for proper assessment of basic science students' performance. All the items are above the criterion mean of 2.50. This indicates that all the teachers agreed, to a great extent, that the items required for teachers' assessment competencies for proper assessment of basic science students' learning outcomes in the public secondary schools were lacking.

Research Hypothesis: There is no significant difference in the competencies of male and female teachers in assessing student's learning outcomes in basic science

Table 3: Summary of Independent Sample t-test on Competencies of Male and Female Teachers in Assessing Students learning Outcomes of Basic Science.

Teachers Level of Competencies	Gender	N	Mean	S.D.	Std, Error Mean	t	Df	Sig(2-tailed)	Decision
Competencies Required by Teachers	Male	107	2.74	0.20	0.02	2.74	198	0.01	Significant
	Female	93	2.67	0.15	0.02				

Table 3 revealed that the male teachers ($N = 107$, mean = 2.74, S.D = 0.20) and the female teachers ($N = 93$, mean = 2.67, S.D = 0.15). Std. EM = 0.02. Sig 2 tailed = 0.01. The P-value of $t(198)$ is less than the alpha level = $P < 0.05$ (Sig. for 2 tailed). The null hypothesis which states that there is no significant difference in the competencies of male and female teachers in assessing students learning outcomes in basic science is rejected. There is a significant difference in the competencies of both the male and female teachers in assessing students learning outcomes of basic science. This shows that there is a need for teachers to update their level of competencies in order to enhance quality assessment skills.

Discussion of Findings

Findings on Research Question 1 indicated that the teachers agreed that public secondary school teachers were not competent in using standardized instruments to assess students learning outcomes in basic science. This was because the instruments they used for assessment lacked validity, reliability, uniformity. These findings contradict Gavin and John's (2012) discovery that standardized instruments when used by competent teachers give a better assessment of students. They also found that because of the use of standardized instruments in the course of instruction, students' self-reported grades before assessments are highly correlated with their actual achievements.

Research Question 2 revealed that all the teachers agreed that items needed for proper assessment of basic science students' learning outcomes in the public secondary schools are lacking. The teachers also agreed that gathering information will draw their attention to the amount of classroom assessment competencies they possess. Such facts can be used by educational institutions to structure teachers' education and professional development to develop teachers' assessment competencies. This finding is in agreement with Setlthomo (2017) who studied 'Assessment of teachers' perceived skill in classroom assessment practices using Item Response Theory models' and found that teachers felt more skilled in test construction than other practices such as using classroom assessment results to make informed decisions in their teaching and learning process.

The result of the hypothesis showed that there is a significant difference in the competencies of both the male and female teachers in assessing students learning

outcomes in basic science. This shows that teachers need to update their level of competencies in order to ensure quality assessment of students' learning outcomes in basic science.

Conclusion

The teachers' assessment competencies in basic science and students' learning outcomes in public secondary schools in Obio-Akpor L.G.A., Rivers State is all about the competencies required of teachers for the proper assessment of basic science students learning outcomes. This can be handled effectively by providing the teachers standardized instruments and by motivating them.

Recommendations

Based on the findings of the study, the researchers recommend as follows:

1. Teachers needed to be educated on the relevance of the usage of standardized instruments for proper assessment of students' learning outcomes.
2. Teachers should be motivated in the conduct of assessment of students.
3. Much attention should be given to the teaching and learning of statistics as embedded in the teachers' college curriculum to enable them to effectively determine the psychometric properties of each test used for assessment.

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