

Early Childhood Care Teachers Classroom Assessment Skills and Approaches in Mathematics in Owerri Educational Zone of Imo State, Nigeria

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ABSTRACT

This study examines classroom assessment skills and approaches of early childhood education teachers in mathematics in Owerri Educational Zone of Imo State, Nigeria. Two research hypotheses are formulated and tested for significant difference between the mean score of the variables. The population of the study consisted of all early childhood care teachers in public schools in Owerri Educational zone Imo State with population size of 1,037 teachers. A sample of 213 early childhood education teachers is selected using stratified random sampling technique. The instrument for data collection is Assessment Skills Inventory (ASI) developed by the researchers and is validated by two experts in mathematics education and one expert in measurement and evaluation. The instrument has reliability coefficient of 0.91 and 0.86 determined using Cronbach alpha reliability method. The data are analyzed using mean and standard deviation while t-test is used to test the two hypotheses formulated for the study at 0.05 level of significance. The results show that classroom assessment approaches used by early childhood education teachers are mostly class exercise, homework, test and quizzes as well as normal assessment test notes grading and communicating results. Also, the results show that female teachers are more skillful in written test items and communicating assessment results than their males counterpart. Consequently, it recommends that workshops and seminars should be organized for early childhood care education teachers on the use of assessment approaches.

Keywords: *Early childhood Teachers, Assessment Skills And Assessment Approaches*

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INTRODUCTION

Early childhood education is the education given in an educational institution to children prior to their entry into primary school. According to the National Policy on Education, a documentaion of the Federal Republic of Nigeria (2014), the purposes of early childhood education are to:

- (i) Effect a smooth transition from the home to the school
- (ii) Prepare the child for the primary level of education
- (iii) Provide adequate care and supervision for the children while their parents are at work
- (iv) Inculcate social norms
- (v) Inculcate in the child the spirit of inquiry and creativity through the exploration of nature, the environment, art, music and playing with toys
- (vi) Develop a sense of co-operation and team spirit
- (vii) Learn good habits, especially good health habits, and
- (viii) Teach the rudiments of numbers, letters, colours, shapes, forms, etc, through play.

It is the foundation of all learning in the life of a child and the basic objectives of Early Childhood to ensure the realization of their full potential (Rok, 2012). Therefore, Teachers all over the world engage in some form of assessment of learners in order to determine how much learning has taken place as well as determining the learners' weaknesses so as to institute remedial measures for improvement purposes (Airasian, 2001 and 1994). According to National Research Council (1996), the modern society requires individuals to have broad cognitive, affective and psychomotor skills. These skills include being able to solve complex problems, critically about tasks, communicate with people from different cultures and to easily adapt to the changing environments. Therefore all these can be achieved through teacher's classroom assessment.

Classroom assessment refers to formative assessment conducted with the aim of enhancing both teaching and learning (Gronlund, 2003; Stiggins and Chappius, 2005; Shephard, 2000). It enables teachers to realize areas that students demonstrate mastery and those that they experience difficulties. Also, it is the process used in the classroom by the teacher to obtain information about learners' performance on assessment task; either as a group or an individual, using a wide range of assessment methods, to determine the extent to which students are achieving the target instructional outcomes (Gallagher, 2005). It enables teachers to realize areas that students demonstrate mastery and those that they experience

difficulties. Information generated through assessment can help teachers to evaluate the effectiveness of their teaching strategies. It is essential to use assessment feedback to make decisions about teaching and learning so as to ensure that meaningful learning takes place. Black and William (1998) conclude that improvement of learning occurs when teachers use classroom assessment information to establish knowledge, skills and attitudes possess by their students and incorporate that information in planning for lessons. The major purpose of conducting classroom assessment is to obtain information about student's progress in learning and the achievement attained (Airasian, 2001; Gronlund, 2003; McMillan, 2008; Popham, 2008).

Classroom assessment skills embraces five areas, they are: (1) skill in writing test items (2) skill in analyzing test items (3) skill in using performance assessment (4) skill in communicating assessment results; (5) skill in grading and test validity (Hussain, 2011). When writing tests items, teachers must be aware of the strengths and weaknesses of test items, and choose appropriate formats to assess different cognitive domains. Test items should match with course objectives and instruction to ensure content validity, reflect basic skills in test construction, improve test reliability, and tap higher-order thinking skills. In performance assessment, validity and reliability can be improved by using observable and clearly defined performance tasks and recording scoring results during assessment. In standardized testing, teachers must possess the skill to standardized test items. Standardized test is test that has norms. Norms are set of descriptive data which make it possible to determine the standardized of a candidate in relation to specific reference group (Onukwo 2002). Writing tests items are based on test statistics, item analysis, item difficulty, item distracter and item discrimination index (Onukwo 2002). Communicating assessment results helps make decisions about students' educational placement, judgment about class and school improvement.

Teachers' assessment approaches reveal that a variety of tools can be used to carry it out. The choice of approaches will depend largely on what is being evaluated (Ndalichako, 2004). Students can be assessed by observing them as they are engaged in classroom activities, by measuring how well their work meets specific criteria, or by giving them different kinds of tests (Ndalichako, 2004). They can be assessed individually or in groups. A number of different approaches can be used to record the results of the assessment, for example, checklists, rating scales, rubrics or anecdotal records and portfolio (Ndalichako, 2004). Observation checklist can be used to assess group activities, reflection on

learning strategies and so on. Checklist, rating scales, and rubrics are assessing tools that state specific contents that allow teachers and students to make judgements about developing competence. They list specific behaviours, knowledge, skills, attitude and strategies for assessment and offer systematic ways of organizing information about individual learners or groups of pupils. Checklists usually take a yes or no format in relation to the specific criteria and may be directed toward observation of an individual, a group, or a whole class. Checklists may be single-use or multiple-use. Anecdotal records are systematically kept notes of specific observations of student behaviors, skills, and attitudes in the classroom. Anecdotal records provide cumulative information regarding progress, skills acquired, and directions for further instruction. Anecdotal notes are often written as the result of ongoing observations during the lessons but may also be written in response to a product or performance the student has completed. Systematic collection of anecdotal records on a particular student provides excellent information for evaluation of learning patterns and consistency of student progress. Well-kept anecdotal records provide a valuable, practical, and specific reference about a student.

Rubrics are an expanded form of rating scale that list several specific criteria at each level of the scale. They may be used to assess individuals or groups and, as with rating scales, may be compared over time (Ndalichako, 2004). Portfolios is generally defined as a collection of student work with a common purpose (Arter and Spandel, 1992; Damian 2004; Popham 2008 and Baron 1991). The key characteristics of portfolio assessment are that it highlights student effort, development, and achievement over a period and emphasizes application of knowledge rather than simple recall of information (Price, Pierson and Light, 2011). The main advantage of using portfolio is the engagement of students in assessing their own progress and achievement and in strengthening collaboration with their teachers through establishing ongoing learning goals (Popham, 2008). Portfolios encourage self-reflection and awareness among students as they review their previous assignment and assess strengths and weakness of both the processes as well as the final products (Ndalichako, 2004). Angelo and Cross (1993) maintain that through close observation of students in the process of learning, classroom teachers can acquire important information about how students learn. The interactions between teachers and students primate a wealth of information about the functioning of the classroom.

Zhang and Burry-Stock (2003) investigate science teacher's assessment practices across teaching levels and content areas. Results show that teacher's

only use checklist as assessment approach. Ihekwebaba, Unamba and Emmanuel (2016) investigate the use of portfolios assessment tool in mathematics teaching practice. The results show that portfolio is not being used by many mathematics educators in assessing teaching practice or any other assessment. Bol, Stephenson, O'Connell, and Nunnery (1998) investigate teachers' frequent use of assessment approaches in relation to teaching experience, grade level, and subject area. The result shows that teachers' methods of assessment included close-ended examinations, quizzes, and other written assignments. In a related study, Snow-Renner (1998) examine teachers' assessment practices in Colorado classrooms. The results of the study show that teachers only use check list in assessment of students learning. Gullickson's (1982) and Mertler (1998) find no significant difference based on teacher's gender use of assessment skills. Ndalichako (2008) examines classroom assessment practices of secondary school teachers in Tanzania. The finding indicates that teachers use checklist as assessment tool in assessing students.

In an investigation of classroom assessment skills of third preparatory science teachers from 112 schools in Oman, Alsarimi (2000) finds out that teachers use short answer, completion, oral exams, extended answer, and multiple-choice item formats and there is no significant differences based on teacher's gender and years of teaching experience on assessment skills. Brookhart (1994) reveals that science teachers show low grading practices and concludes that teacher lacks grading practices in schools.

Assessment is a major tool in the process of determining the quality of education. Education should yield desirable outcomes in the acquisition of cognitive, psychomotor and affective skills by the learners. Assessments are essential in determining the extent to which the learners have achieved the intended curriculum objectives. However the emphasis is more on the assessment of learning rather than assessment for learning. Most of the teachers are not well equipped with the assessment skills and the authentic assessment approaches that encourage creativity, critical thinking and analytical skills. It is therefore important to emphasize that learners at this level are developing basic cognitive, psychomotor and affective skills , for these skills to be developed there should be close monitoring and interaction between the teachers and the learners at nearly every stage of learning. This can be achieved with the authentic assessments skills and approaches. It is therefore necessary to carry out baseline studies to find out the early childhood care education teachers assessment skills and approaches in mathematics. The main purpose of the study was to investigate

teachers' classroom assessment skills and approaches in mathematics. Specifically the study seeks to:

- i. Identify the assessment skills possessed by early childhood care education teachers in mathematics.
- ii. Identify the assessment approaches used by early childhood care education teachers in mathematics.
- iii. Examine whether difference will exist among male and female early childhood care education teachers on assessment skills.
- iv. Examine whether difference will exist among male and female early childhood care education teachers on assessment approaches.

Based on the above, the following hypotheses were formulated for the study.

- H₀1. There is no significant difference in between male and female early childhood care education teachers' assessment skills in mathematics?
- H₀2. There is no significant difference in between male and female early childhood care education teachers' assessment approaches in mathematics?

METHOD

This study adopted survey research design. The population of the study consisted of all early childhood care teachers in public schools in Owerri Educational zone Imo State with population size of 1,037 teachers (Secondary Education Management Board 2017). A sample of 213 teachers was selected using simple random sampling technique comprising 100 male and 113 female early childhood care education teachers. The instrument used for data collection was structured questionnaire developed by the researchers. It comprises two sections A and B. Section A deals with the demographic data of the respondents while section B was divided in two clusters. Cluster 1 Early Childhood teachers assessment approaches (ECTAA). The ECTAA was measured on a 4-point scale format of most frequently used, frequently used, less frequently used and very rarely used, which were assigned numerical values, 4, 3, 2, and 1 while cluster 2 sub-titled Early Childhood teachers Assessment skills (ECTAS) contains 25 items structured on a 5-point Likert scale ranging from 1 (not at all skilled) to 5 (very skilled) was used to assess teachers assessment skills. The face and content validity of the instrument were established by lecturers who are experts in Mathematics Education and measurement and Evaluation. They scrutinized the contents of the questionnaire, offered useful corrections and suggestions, which led to some

modifications. Based on such corrections and modifications, the instrument was considered adequate and the final draft of the questionnaire was produced. The reliability of the instrument was established using trial-test method on early childhood teachers outside the sample of the study using Cronbach Alpha method to establish reliability co-efficient of 0.83. In analyzing the data, mean and standard deviation were used. T-test and ANOVA were used to test the hypotheses at 0.05 level of significance.

RESULTS AND DICUSSION

Table 1 shows that early childhood care education teachers had higher mean score on communicating assessment results in mathematics. Table 2 shows that the most frequently used assessment methods include class exercises, homework, quizzes, tests and class observation. Results in table 3 shows that there were statistically significant gender differences in the assessment skills in analyzing test items, communicating assessment results, using performance assessment and grading. Results in table 4 shows that there is significant difference between male and female early childhood care education teachers on assessment approaches in mathematics. The results further reveal that there were statistically significant gender differences in the assessment skills in analyzing test items, communicating assessment results, using performance assessment and grading. Gullickson's (1982) and Mertler (1998) find significant differences based on teacher's gender use of assessment skills. Also, the results of the study show that early childhood teachers classroom assessment approaches ranges from home work, quizzes, class observation, tests, projects and practical exercises. This finding is in line with Ndalichako (2004) in her study which reveals that the predominant forms of assessment that were used frequently by primary school teachers included class exercise, tests and quizzes and homework.

Table 1: Mean and standard deviation on classroom assessment skills

Items	Mean	SD
Analyzing test items	1.03	0.83
Communicating assessment results	3.32	1.45
Writing test items	1.75	0.76
Using performance assessment	1.31	0.63
Grading	1.25	0.71

Source: Survey, 2017

Table 2: Mean and standard deviation of various assessment approaches.

Assessment Approaches	Mean	SD
Home work	4.06	1.45
Quizzes	4.71	1.23
Class observation	4.25	1.32
Tests	4.15	1.29
Portfolios	0.32	0.23
Projects	2.28	0.76
Class exercises	4.28	1.32
Practical exercises	3.44	1.67

Source: Survey, 2017

Table 3: T-test analysis on assessment skills by gender.

Variables	Male		Female		t-cal	t-critical
	Mean	SD	Mean	SD		
Analyzing tests items	1.25	0.27	1.30	0.32	2.40	1.96
Communicating assessment results	3.48	0.39	3.78	0.28	2.84	
Writing test items	1.50	0.36	1.75	0.32	2.16	
Using performance assessment	1.31	0.43	1.15	0.41	2.68	
Grading	1.96	0.58	1.94	0.56	3.20	

Source: Survey, 2017

Table 4: T-test analysis on assessment approaches by gender.

Items	Male		Female		t-cal	t-crit	Decision
	Mean	SD	Mean	SD			
Quizzes	15.20	3.74	15.48	3.88	2.26	1.96	Reject H ₀
Class observation	20.99	2.94	20.60	3.11	2.38		
Tests	17.56	2.86	17.98	2.86	3.11		
Portfolios	19.18	2.98	19.68	2.73	2.86		
Projects	18.24	3.40	18.70	1.99	2.73		
Class exercises	10.38	1.93	11.64	2.38	1.99		
Practical exercises	11.61	2.14	11.90	2.43	2.43		
Home work	16.41	2.33	16.89	2.26	2.52		

Source: Survey, 2017

CONCLUSION

The main purpose of the study was to investigate teachers' classroom assessment skills and approaches in mathematics in Owerri Educational Zone of Imo State, Nigeria. The results show that classroom assessment approaches used by early childhood education teachers are mostly class exercise, homework, test and quizzes as well as normal assessment test, notes grading and communicating results. The results further show that female teachers are more skillful in written

test items and communicating assessment results than their males counterparts. Hence, it concludes that there is significant difference on early childhood care education teachers classroom assessment skills. And that there is significant difference on early childhood care teachers classroom assessment approaches. Based on the findings of this work, workshops and seminars should be organized for early childhood care teachers on the use of assessment approaches. Early childhood care teachers should improve their construction of writing items and communication assessment skills through research and practice.

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