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EDITORIAL

Dear Readers,

We are excited to announce the launch of International Journal of Contemporary Issues in Integrated Science Education (IJCIISE). This Association Integrated Science Educators' Association of Nigeria (ISEAN) play a vital role in promoting scientific advancement, supporting science education, informing science policy, recognizing science excellence and fostering community engagement. The desire to float this journal was borne out of the passion to organize a yearly conference of Integrated Science by the Integrated Science Educators' Association of Nigeria, of which selected scholarly articles will be published after a thorough review. The journal dedicated to advancing knowledge and fostering dialogue within. Our mission is to publish high-quality research, innovative ideas, and critical analyses that contribute to the understanding and development of Integrated Science. At IJCIISE, we believe in the power of interdisciplinary collaboration and inclusivity. We welcome contributions from scholars, practitioners, and thought leaders worldwide, providing a space for diverse perspectives and groundbreaking work. As we embark on this journey, we invite you to submit your research, engage with our content, and join us in creating a vibrant academic community. Together, we can push the boundaries of knowledge and inspire future generations. Thank you for your support as we launch this exciting new endeavour.

This edition moves around issues that border on "**Enhancing Quality Assurance in Integrated Science in Nigeria.**" It is believed that diverse contributions from scholars and researchers expressed in this edition will provoke the understanding of issues that could foster education for societal transformations on a global scale
We look forward to your contributions!

For further information on future conference activities, visit <http://ijciise.org/index.php/ijciise>

Warm regards,
Professor O. S. Agboola
President, Integrated Science Educators' Association of Nigeria (ISEAN)

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TEACHERS' FEEDBACK AND SENIOR SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN MATHEMATICS

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Abstract

The study investigated the influence of feedback on senior secondary school students' academic achievement in mathematics in Osun-State. The study adopted the descriptive survey research design of correlational type. The study population comprised all Mathematics teachers and students in senior secondary schools in Osun State. The sample for the study consisted of 40 Mathematics teachers and 400 students who were selected using simple random sampling technique. Two instruments were used for data collection. They are: "Teachers' Feedback Questionnaire" (TFQ) and "Students' Last Term Results in Mathematics". Data collected were analyzed using frequency, percentage, mean and regression analysis. The results of the study showed that the level of senior secondary school students' academic achievement in Mathematics was moderate at 50.3% in Osun State. Results of the study also revealed that corrective feedback ($\bar{x} = 3.28$), evaluative feedback ($\bar{x} = 2.71$) and descriptive feedback ($\bar{x} = 2.65$) are the various feedbacks adopted by Mathematics teachers in senior secondary schools in the study area. The result of the study further showed that there was significant influence of teachers' feedback on senior secondary school students' academic achievement in Mathematics in the study area ($F = 3.675$; $p < 0.05$). This study concluded that feedback play a significant influence on academic achievement in Mathematics in Osun State.

Keywords: Academic Achievement, Feedback, Mathematics.

Introduction

Mathematics is one of the subjects that occupy the center stage in the pursuit of a science course in the university. Mathematics is a core subject in the school curriculum that deserves a serious attention. Onuigbo and Eze (2010) opined that mathematics is so crucial that it is a prerequisite for admission into Nigerian universities. There is no doubt that secondary school students' go to school with the aim of acquiring dependable knowledge and passing excellently in subjects that will enable them to study their dream courses in higher institutions. Mathematics is such a subject that can help students to realize their dreams. Mathematics is a mental activity which facilitates abstractions, inductive and deductive reasoning. Mathematics is the backbone of all science subjects. It is the bedrock of intellectual development and the foundation of all the innovations and inventions individuals see in science and technology today.

The concept of Mathematics is as old as creation. Historically, Mathematics is believed to have developed out of the need for man to meet certain expectations in life. Soyemi (2010) stressed that Mathematics is a way of life and all-embracing body of knowledge that opens up the mind to logical reasoning, analytical thinking and the ability to make abstract objects look real or concrete. In other words, Mathematics ignites or challenges one to develop competence in creative thinking, deep focusing and clarity of thoughts as well as develop ability in seeing things with inner eye. Giving feedback and involving students are important techniques of formative assessment. Questioning is a powerful tool for eliciting information about gaps in students' understanding. (Cowie & Bell, 2009; William & Thompson, 2010). A feedback component in response to the thought-provoking questions often takes the form of productive dialogue between teacher and student and his or her peers (Chin, 2009). The selection of different feedback was based on the common practices employed by teachers, including formative feedback, summative feedback, evaluative feedback, descriptive feedback, norm-referenced feedback, and self-referenced feedback. Feedback can act on the means and the ends in the conceptual understanding.

According to (Francis, Mahlomaholo, & Nkoane, 2010), effective feedback motivates teacher and peer dialogue, supports the development of self-assessment in students' learning, and offers information to teachers and learners that is very useful to plan both teaching and learning. It also provides an opportunity to narrow the gap between students' current and required performance. However, although feedback is known as a central part of formative assessment it is still a challenge to teachers and learners. Feedback can be given in different ways. Interactive feedback cannot be planned in advance. It is an activity where evidence about learning is generated in the course of teachers' day to day classroom activities. Hattie and Timperley (2007) said that the main purpose of any type of feedback is to lessen the gap between current understanding, performance, and a goal. According to a model presented by Hattie and Timperley, feedback must address three questions: a) where am I going? b) How am I going? c) Where to next. According to Francis, Mahlomaholo and Nkoane (2010) length and complexity of feedback should be considered when it is given to the learners because feedback is a more complex activity than giving grades. Generally, formative feedback is delivered to encourage students to improve their performance in the future. Randall and Mirador (2003) have shown that summative feedback is considered as a single comment about the quality of the students' work, while formative feedback is expected to provide a comment which is developmental in nature. According to Shute (2008), the main purpose of formative feedback is to enhance students' knowledge, understanding, and Skills in some content area. The quality of feedback depends upon immediacy, relevance, reliability and the type and amount of feedback provided. Nicole and Dick (2010) have shown that influence of feedback is information that supports students to act for closing the gap between intent and effect.

Generally, it has been revealed that a lot of students and teachers are not aware of such (Pretorius, 2012). Feedback is an essential part of effective learning. It helps students understand the subject being guided and gives them clear guidance on how to

improve their learning. Bellon, Bellon and Blank (2014) stated that academic feedback is more strongly and consistently related to achievement than any other teaching behavior, this relationship is consistent regardless of scores, socioeconomic activities, status, race, or school setting.' Feedback can improve a student's confidence, self-awareness and enthusiasm for learning. Effective feedback during the first year in the secondary school can aid the transition to higher education and may support student retention. Providing students engage with feedback, it should enhance learning and improve assessment performance. The quality of education depends on the performance of the duties by teachers. The performance of students in examination, whether internal or external, had been used to judge how good the teachers are in teaching (Ajao, 2008). During interaction with student, the teachers ultimately translate policy into action and principles based on practice (Afe, 2007). Thus, a teacher is the one who produces result when trying to do his duty (Uchefuna, 2005).

Over the years, efforts have been made to enhance students' mathematics achievement; yet students' achievement in mathematics has continued to dwindle, especially in external examinations. With the huge investment of government in public education, the output is nothing to write home about. The failure rates and the poor quality of students might have been a reflection of the instructional quality in schools and thus the widely acclaimed fallen standard of education in Nigeria. Students' views on all aspects of their higher education experiences are essential to the effective monitoring of quality in secondary schools (Hill et al, 2003). In the United States of America and in European Countries, teachers' evaluation of student performance is very important for appraising the academic staff (Curtis, 2002; Emery, Kramer & Tian, 2003). This is not the case in Nigeria where qualifications, teaching, current research, publications and service to schools /country are used (Mordi, 2002; Adomi & Mordi, 2006). Secondary schools teachers are also expected to possess content competence, mastery of subject teaching pedagogical competence, and the ability to deal with sensitive topics in an open, honest, and respectful way, the ability to contribute to the intellectual development of the student, the ability to treat students' scores, other academic records, and private communications with strict confidentiality, assessment of students that is valid, open, fair and congruent with the subject, and respect for the school (Murray et al. 2009).

Duyilemi (2008) argued that some mathematics teacher showed positive attitude towards teaching the science subjects while some exhibited negative attitude towards teaching mathematics subject to the students. Aigbomian (2016) have argued that the extent a student prefers a subject, to that extent the student works hard to achieve in it. A close examination of the submissions of Aigbomian (2016) & Duyilemi (2008) revealed that academic achievement maybe dependent upon positive attitude from the academic staff and the students in the teaching/learning processes. Quality mathematics teaching occurs when teachers believe all students needs to develop mathematical capabilities and conceptual understanding in order to be equipped to live in our society. Also, they should believe that students are able to achieve the science outcomes when they engage in effective teaching and learning programs, students should be

encouraged to believe they can be successful learner in the area of Mathematics. Mathematics teaching should therefore take place in a supportive environment that caters for individual differences, includes opportunity for cooperative and collaborative group work, allow student to engage in sustained conversation and task about the “big ideas” that Underpin the achievement of science and technology outcomes, should also include opportunity for substantive interaction between students to students and teacher to student, encourage sustained effort by students to successfully complete task, provides access to a range of materials equipment and other resources related to science learning. Many reasons can be attributed to students' academic achievement in mathematics. Feedback as a factor that can predict or affect the academic achievement of students in mathematics has not been thoroughly looked into. It is against the background that the study investigates the influence of teachers' feedback on senior secondary school students' academic achievement in Mathematics in Osun State is considered necessary.

Studies have shown that students performed poorly in Mathematics, both in internal and external examinations. This may not be unconnected with the teachers' feedback on students in the subject. Therefore, the need to investigate the influence of teachers' feedback on senior secondary schools students' academic achievement in Mathematics in Osun State, hence this study.

Purpose of the Study

The purpose of the study is to investigate the influence of teachers' feedback on academic achievement of students' in Mathematics in senior secondary schools in Osun State. Therefore, the specific objectives of the study are to:-

- i. determine the feedbacks' adopted by Mathematics teachers' in senior secondary schools in Osun State ; and
- ii. examine the influence of feedback on senior secondary school students' academic achievement in Mathematics in the study area.

Research Questions

The following research questions were raised to guide the study:

1. What is the level of senior secondary school students' academic achievement in Mathematics in Osun State?
2. What is the importance of feedback by the teachers towards senior secondary school students' academic achievement in Mathematics in Osun State?

Hypothesis

There is no significant influence of teachers' feedback on senior secondary school students' academic achievement in Mathematics in the study area.

Methodology

The study adopted the descriptive survey research design of correlational type. The population for the study comprised all Mathematics teachers and students in senior secondary schools in, Osun State. Multistage sampling procedure was used to select the

sample for the study. In the State, one local government area was selected from each of the three senatorial districts in the State. From each selected local government, ten secondary schools were selected using simple random sampling technique. In each selected school, two Mathematics teachers and twenty students were also selected using simple random sampling technique totaling 40 teachers and 400 students that constituted the sample size for the study. Two research instruments were used for data collection. They are: “Teachers' Feedback Questionnaire” (TFQ) and “Students' Last Term Results in Mathematics”. Data collected were analysed using frequency, percentage, mean and regression analysis.

Results

Research Question One: What is the level of senior secondary school students' academic achievement in Mathematics in Osun State?

In order to answer this research question, data collected on the sampled students' scores in previous term Mathematics results were scaled such that scores on the range; 0.0%-49.0% = Low Scores; 50.0%-69.0% = Moderate Scores; and 70.0%-100.0% = High Scores. The summary of the results is presented in Table 1 below.

Table 1: Descriptive analysis of the level of senior secondary school students' academic achievement in Mathematics in Osun State

S/N	Scores range	Level	Frequency	Percentage
1.	0-49	Low	109	27.30
2.	50-69	Moderate	201	50.3
3.	70-100	High	090	22.5
Total			400	100.0

N = 400

Results in Table 1 shows the descriptive analysis of the level of senior secondary school students' academic achievement in Mathematics in Osun State. It can be observed from the Table that 27.3%, 50.3% and 22.5% of the sampled students scored low, moderate and high respectively in Mathematics in the study area. However, the level of senior secondary school students' academic achievement in Mathematics was moderate at 50.3% in Osun State.

Research Question Two: What are the feedbacks adopted by Mathematics teachers in senior secondary schools in Osun State?

In order to answer this research question, data collected were subjected to frequency, percentage and mean having considered the responses of the teachers to each item. The results are presented in Table 2.

Table 2: Descriptive analysis of feedbacks adopted by Mathematics teachers in senior secondary schools in Osun State

S/N	Feedbacks	Frequency (f)	Percentage (%)	Mean (\bar{x})
1.	Corrective	33	82.5	3.28
2.	Evaluative	26	65.0	2.71
3.	Descriptive	25	62.5	2.65

N = 40

Results in Table 2 shows the descriptive analysis of the feedbacks adopted by Mathematics teachers in senior secondary schools in Osun State. Considering mean values, it can be deduced from the Table that corrective feedback ($x= 3.28$), evaluative feedback ($x = 2.71$) and descriptive feedback ($x= 2.65$) are the various feedbacks adopted by Mathematics teachers in senior secondary schools in Osun State. However, corrective feedback with the highest mean value of 3.28 indicated that it was the main feedback adopted by Mathematics teachers in senior secondary schools in the study area.

Hypothesis

H₀1: There is no significant influence of teachers' feedbacks on senior secondary school students' academic achievement in Mathematics in the study area.

In order to test this hypothesis, data collected on the various feedbacks adopted by teachers (independent variable) and the sampled students' academic achievement (dependent variable) in Mathematics were subjected to regression analysis. The result is presented in Table 3.

Table 3: Regression analysis of the influence of teachers' feedbacks on senior secondary school students' academic achievement in Mathematics in the study area

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
R = 0.725 ^a					
R ² = 0.526					
Adj. R ² = 0.022					
F = 3.675					
(Constant)	85.575	22.235		1.751	.001
Teachers' feedback	42.142	15.457	0.992	1.642	.004

a. Dependent Variable: Academic Achievement (AA)

b. Predictors: (Constant), Teachers' feedback

Results in Table 3 shows a significant influence of teachers' feedbacks on senior secondary school students' academic achievement in Mathematics in the study area ($F = 3.675$; $p < 0.05$). Therefore, the null hypothesis that states that there is no significant influence of teachers' feedbacks on senior secondary school students' academic achievement in Mathematics in the study area is hereby rejected. The R² value of 0.526 accounted for 52.6% influence of teachers' feedbacks on academic

achievement of senior secondary school students in Mathematics in the study area.

Discussion of Findings

Findings of the study showed that the level of senior secondary school students' academic achievement in Mathematics was moderate at 50.3% in Osun State. Achievement is the word preferred in the educational or psychometrics fields as the degree of competence required on the part of students to give correct responses to measurement tool (Salvador & Dasí, 2001). In summary, achievement is the realization of oneself dreams by successfully completing a given task. Achievement is the ability to overcome obstacles and actualize success, while mathematics achievement is the ability of a learner to attain success in a mathematics test. Mathematics achievement is directly related to the score a student obtains in a mathematics test. The score may be low, average or high. If a student consistently obtains a score that is above average, the student can be referred to as a high mathematics achiever. But if a student's mathematics score is continuously below average (50%), the student is labeled a low mathematics achiever. The contrast between high and low mathematics achieving students is clear in each school.

Results of the study showed that corrective feedback, evaluative feedback and descriptive feedback are the various feedbacks adopted by Mathematics teachers in senior secondary schools in Osun State. The results in a way supports the finding of Hygge (2013) when it was underlined that distraction can also interfere with learning by affecting memory recall at a recency stage and primacy stage and acting as a hindrance that impairs a student's ability to pay attention. To him, the ability to pay attention is most important when students are engaged in tasks that demand higher mental processes, such as learning new concepts or when teachers are verbally presenting new or complex information. Schneider (2012), in the same vein, commented that good acoustics are fundamental to good academic performance.

The results of the study further showed that there was significant influence of teachers' feedbacks on senior secondary school students' academic achievement in Mathematics in the study area. The result corroborates the findings of Mudassir and Norsuhaily, (2015) conducted a study to examine how feedback influence students' mathematics academic achievement in selected secondary schools within Kuala Terengganu. The result of the study indicated that students from a school with adequate and prompt feedback equipped with good and qualified teachers perform better than those from schools without such characteristics, unqualified teachers and less enabling environment.

Conclusion

The finding showed that: the level of senior secondary school students' academic achievement in Mathematics was moderate in Osun State, also corrective feedback, evaluative feedback and descriptive feedback are the various feedbacks adopted by Mathematics teachers in senior secondary schools in Osun State. Based on the findings, the study concluded that teachers' feedback had significant influence

on senior secondary schools students' academic achievement in Mathematics in Osun State.

Recommendations

Based on the research findings of the study, it is therefore recommended that: Curriculum Planners should be encouraged by the Government to incorporate feedback mechanism into secondary school mathematics curriculum, secondly, Seminars and workshops should be organized for teachers in both public and private schools on the needs for teachers' feedback in mathematics classroom instructions, and thirdly, School administrators should boost the morale of teachers by providing necessary materials that might influence the feedback needed from teacher so as to foster and ensure effectiveness from the achievement desired in Mathematics.

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