

Effective Instruction, Classroom Activities and Formative Assessment in the Maximization of Students Learning Behaviors

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Abstract: Researchers and educators often place much emphasis on the cognitive component of students learning while little or no attention is paid to many other factors that seem to contribute to students decline in learning. This poses a major challenge to the education system in Nigeria. This study investigated the contribution of effective instruction, classroom activities and formative assessment to the maximization of students learning behaviors. The study adopted a correlation al survey design. Three research questions and one null hypothesis. guided the study and was carried out in Nsukka Education Zone of Enugu state, Nigeria. The population of the study comprised all SSII students in the zone from which a sample of 210SSII students representing 10% of the population was drawn for the study. A validated instrument for data collection developed by the researchers had reliability coefficients of 0.79, 0.84, 0.86 and 0.81 for effective instruction, classroom activities, formative assessment and students learning behaviors, respectively was used for the study. The research questions were answered using Pearson Product Moment Correlation Coefficient, Coefficient of determination and unstandardized coefficient. The hypothesis was tested using regression ANOVA at 0.05 level of significance. Result of the study showed that the amount of variation in students' maximization of their learning behaviors, based on effective instruction, classroom activities and formative assessment is statistically significant. The study recommends among others that teachers should increase the number of activities that challenge students creativity, critical thinking, problem solving and study skills as they learn relevant contents essential to life.

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INTRODUCTION

Students have a natural propensity to acquire and harness knowledge organized around relevant activities for useful learning. This may bring about a permanent change in behavior as a result of experiences and accumulated learning acquired by individuals or students, depending on their learning behaviors. Learning behaviors are those which students or learners exhibit in the classroom setting or other learning situations. These behaviors are exhibited by students overtly, for instance 'telling the teacher what they do not understand' or 'suggesting new activities' that promote meaningful learning^[1]. In this regard, learners acquire and construct their own knowledge and understanding on the basis of what they are adequately exposed to or believe, especially when learners are actively involved or when learners have the opportunity to take control of their own learning for optimum maximization of their learning behaviors^[2].

In maximization of learning behaviors, students take varying decisions concerning their own learning. While some learners prefer to learn in groups, many may like to learn independently. Some may prefer to learn using concrete materials, others might prefer abstract contents and their underlying meanings. In the same vein, some may be eager to ask and answer questions whereas, others may behave otherwise. According to Jonassen and Grabowski^[3] the reason can be attributed to individual differences among the learners and variations in their learning behaviours. This calls for an effective instruction which does not only increase students academic performance but also lead to the maximization of learning behaviors^[4]. In other words, good or poor students learning behaviour is considered to be affected by the teacher's instruction which could be effective or otherwise^[5]. Studies have also shown a strong positive correlation between poor learning behaviour and low academic achievement^[6].

Apart from the above result, Payne *et al.*^[7] reported that effective instruction and learning behaviours are reciprocal in nature. That is to say ineffective instruction may negatively influence students maximization of their learning behaviours. This also implies that the extent of students maximization of their learning behaviours which in-turn lead to success or failure may be largely determined by how well teachers provide effective instruction and classroom activities to their students and also how they carry out formative assessment to maximize students learning behaviours.

Effective instruction is the systematic presentation of content necessary for mastery within a general area of knowledge. Archer and Hughes^[8] noted that effective instruction involves overtly teaching by breaking lessons and activities into sequential, manageable steps that progress from simple to more complex concepts and skills with ample opportunities for students to respond and demonstrate what they are learning and also providing

immediate feedback. It is characterized by adequate planning, managing, delivering and evaluating instruction in order to enhance learning. Effective instruction is thus dependent on both teacher behavior and the instructional procedure that is being adopted. According to Slavin^[9], effective instruction which involves students participating in well-planned and implemented learning or classroom activities engages their time and make them to become more successful both academically and behaviourally.

Thus, the effectiveness of instruction is vital in determining whether students learn in the classroom. According to Dewing, too many classrooms are now characterized by low-level activities rather than diverse instructional strategies that actively engage students in activities that enhance maximal learning. So, teachers can find possible ways to bridge the gap between what the students know and what they are yet to know by implementing worthwhile classroom activities through effective instruction that enhances the performance of the students. Classroom activities become increasingly diverse as teachers tap into students interests and abilities to help them absorb learning experiences in different school subjects.

Classroom activities are basically defined as tasks performed by teachers and students in the classroom. They can also be viewed as tasks assigned by the teacher to students which require them to reflect on the ideas they are exposed to and how they can use such ideas to solve problems. The activities are concerned with students or learners doing things and thinking about what they are doing. Such activities promote intellectual, social, emotional and behavioral changes in the learner (s). In this light, Andrawis suggested that classroom activities should focus the responsibility of learning on learners who engage with the contents and cognitively become active in the learning process.

In the same vein, Zepke and Leach^[10] opined that such activities must provide students with opportunities to share ideas, test their thinking and examine different perspectives on issues exposed to them by the teacher. That is why teachers ought to increase the number of challenging activities that engage all students in displaying creativity, critical thinking, problem solving and favourable study skills as they learn the contents essential to life. Examples of such classroom activities are when the teacher pauses to give students a chance to ask questions, carry out their class work, present their work, clarify and consolidate their notes with others. It also includes engaging students in in-class discussions, small group work, quizzes, debates and/or peer teaching, demonstrations and/or simulation exercises. These activities can reasonably be thought to promote the maximization of students learning behaviours. Thus, it is also important to ensure that such activities are relevant, learner-centred and will contribute to the students achievement of learning objectives.

In recent years, assessment of students achievement has been receiving the attention of teachers, parents, researchers and education systems. This attention has highlighted formative assessment as integral to the teaching and learning process. Formative assessment is a systematic process of continuously gathering evidence about learning^[11]. In the classroom, formative assessment refers to frequent interactive assessments of student progress and understanding to identify learning needs and adjust teaching appropriately^[12]. It is also the process that teachers and students engage in during the instruction that provides feedback to both parties regarding the level of each students understanding and skill with regard to the benchmarks and standards being taught. Teachers using formative assessment approaches and techniques are better prepared to meet diverse students needs through differentiation and adaptation of teaching to raise levels of student achievement and to achieve a greater equity of student outcomes^[13].

In formative assessment, students are active participants with their teachers, sharing learning goals and understanding on how their learning is progressing and areas of possible improvement^[14]. In essence, it is geared towards maximizing students learning by pinpointing gaps in their knowledge thereby providing teachers with key information that would be used to adjust instruction accordingly to best meet the needs of students. This type of assessment is often described as assessment for learning. According to Stiggins *et al.*^[15] "assessment for learning happens while learning is still underway. In other words, it is conducted throughout teaching and learning to diagnose students needs, plan the next steps in instruction, provide students with the feedback they can use to improve the quality of their learning and help students see and be in control of their learning. Thus, formative assessment, if used effectively, can provide teachers and their students with the information they need to improve or move learning forward.

In the world and Nigeria in particular, there is a decline in students learning which is evident in poor achievement in most school subjects. The decline in students learning is attributable to ineffective instruction, absence of classroom activities and formative assessment among others. Researchers and educators have placed much emphasis on the cognitive component of students and little or no attention has been paid to many other factors and conditions that seem to contribute to students decline in learning. Given the above situation, there is need for a paradigm shift to factors and conditions that strengthen and maximize students learning. When students learning is faulty, they are bound to be involved in examination malpractice whether internal or external. They are also unreliable, unemployable and even

constitute nuisance to the society. It is therefore, pertinent to determine the extent to which effective instruction, classroom activities and formative assessment contribute to the maximization of students learning behaviours.

Purpose of the study: The general purpose of this study is to ascertain the extent to which effective instruction, classroom activities and formative assessment account for students maximization of their learning behaviours. Specifically, the study aims to ascertain the: amount of variation in the maximization of students learning behaviours attributed to effective instruction, classroom activities and formative assessment. Amount of variation in the maximization of students learning behaviours jointly attributed to effective instruction, classroom activities and formative assessment. Regression model and relative contribution of each predictor variable in predicting students maximization of their learning.

Research questions: What amount of variation in the maximization of students learning behaviours is attributed to effective instruction, classroom activities and formative assessment?

What is the amount of variation in the maximization of students learning behaviours jointly attributed to effective instruction, classroom activities and formative assessment?

What is the regression model and relative contribution of each predictor variable in predicting students maximization of their learning?

Hypothesis: The amount of variation in students maximization of their learning behaviours based on effective instruction, classroom activities and formative assessment is not statistically significant.

MATERIALS AND METHODS

The study adopted correlational research design to determine the relationship between effective instruction, classroom activities, formative assessment and students maximization of their learning behaviours. The area of the study was Nsukka education zone. The population of the study comprised all the Senior Secondary School II (SSSII) students for 2015/2016 session. A sample of 210 students was used for the study. The instrument used for data collection was a questionnaire developed by the researchers comprising 40 items. The questionnaire was divided into four Clusters A-D. Cluster A sought information on effective instruction, Cluster B elicited information on classroom activities, Cluster C was on formative assessment and Cluster D was on students maximization of their learning behaviours. The

questionnaire was modeled on a 4 point rating scale with response options of Strongly Agree (SA); Agree (A); Disagree (D) and Strongly Disagree (SD) with numerical values of 4, 3, 2 and 1 points assigned to each of the responses, respectively.

Three experts in measurement and evaluation, University of Nigeria, Nsukka, validated the instrument. The questionnaire was trial tested on SSII students from Enugu Local government area in order to measure the internal consistency of the items. Reliability coefficients of 0.79, 0.83, 0.86 and 0.81 were obtained for clusters A-C and D, respectively and the overall reliability of 0.82 was obtained for the instrument. The researchers used direct delivery method in the administration and retrieval of the questionnaire from the respondents. Pearson Product Moment Correlation Coefficient and coefficient of determination were used to answer research questions while Regression Analysis was used to test the null hypotheses at 0.05 level of significance. Correlation coefficients of 0.80 and above were regarded as high relationship; 0.30-0.79 were regarded as moderate relationship, 0.01-0.29 were regarded as low relationship and a correlation coefficient of 0.00 was regarded as no relationship.

RESULTS AND DISCUSSION

Research question 1: What amount of variation in the maximization of Students Learning Behaviors (SLB) are attributed to effective instruction, classroom activities and formative assessment?

To answer this research question, the scores from the responses of the respondents on maximization of Students Learning Behaviors (SLB) were correlated with effective instruction, classroom activities and formative assessment. The result in Table 1 showed that the correlation coefficient of 0.89, 0.64 and 0.43 were obtained for Maximization of (SLB) and Effective instruction, classroom activities and formative assessment respectively. This means that there exist high direct positive relationships between maximization of Students Learning Behaviors (SLB) and effective instruction. There also exist moderate direct positive relationships between maximization of Students Learning Behaviors (SLB) and classroom activities and formative assessment. Table 1 also shows that, the coefficient of determination (R^2) associated with the correlation coefficient of 0.89, 0.64 and 0.43 were 0.79, 0.41 and 0.18, respectively. This coefficient of determination (R^2) indicates that the amount of variation in the maximization of Students Learning Behaviors (SLB) attributed to effective instruction, classroom activities and formative assessment were 79, 41 and 18%, respectively.

Table 1: Pearson's product moment correlation analysis of maximization of Students Learning Behaviours (SLB) attributed to effective instruction, classroom activities and formative assessment

Variables	r	R^2	Percentage
Maximization of (SLB) and effective instruction	0.89	0.79	79
Maximization of (SLB) and classroom activities	0.64	0.41	41
Maximization of (SLB) and formative assessment	0.42	0.18	18

R^2 = coefficient of determination, N = 210

Table 2: A model summary of the variation in the maximization of students learning behaviours jointly attributed to effective instruction, classroom activities and formative assessment

Models	R	R^2	Adjusted R^2
1	0.67	0.45	0.43

Predictors: effective instruction, classroom activities and formative assessment

Research question 2: What is the amount of variation in the maximization of students learning behaviours jointly attributed to effective instruction, classroom activities and formative assessment?

Result in Table 2 seeks to find out how much of the overall variance of the maximization of Students Learning Behaviors (SLB) is explained by the predictor variables (effective instruction, classroom activities and formative assessment). Results in Table 2 showed that the relationship of the predictor variables and the criterion variable was 0.67 and the coefficient of determination (R^2) was 0.45. This means that 45% of the total variance explains the maximization of Students Learning Behaviors (SLB) attributed to effective instruction, classroom activities and formative assessment jointly.

Research question 3: What is the regression model and relative contribution of each predictor variable in predicting students maximization of their learning?

Table 3 shows that the regression model is $SLB = 4.03 + 0.87EI + 0.68CA + 0.31FA$. From the regression model, the three predictor variables proved potent at predicting students maximization of their learning behaviours to an appreciable extent. Effective instruction has the highest predictive capacity and also made the greatest contribution among the predictor variables. This is followed by classroom activities and formative assessment being the least. This is because one unit change in effective instruction, classroom activities and formative assessment will produce 0.87, 0.68 and 0.31 changes respectively in students maximization of their learning behaviors while 4.03 is the level of students maximization of their learning behaviors with out the influence of the predictor variables (effective instruction, classroom activities and formative assessment).

Hypothesis 1: The amount of variation in students maximization of their learning behaviours based on

Table 3: Relative contribution of each predictor variable in predicting students maximization of their learning

Models	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t-values	Sig.
(Constant)	4.032	0.404		9.983	0.000
Effective Instruction (EI)	0.868	0.018	0.869	48.235	0.000
Classroom Activities (CA)	0.680	0.033	0.690	20.413	0.016
Formative Assessment (FA)	0.310	0.039	0.327	2.850	0.004

Table 4: Regression analysis of computer anxiety and students preparedness for computer based assessment

Models	Sum of squares	df	Mean square	f-values	Sig.
Regression	3072.127	1	3072.127	146.674	0.00
Residual	4386.473	208	21.089		
Total	7458.600	209			

$\alpha = 0.05$

effective instruction, classroom activities and formative assessment is not statistically significant. In order to test hypothesis 1 (H_{01}), multiple regression analysis was used. The result in Table 3 shows that an F-ratio of 146.67 with associated exact probability value of 0.00 was obtained. This exact probability value of $0.00 < 0.05$ level of significance set as benchmark for testing the hypothesis and it was found to be significant. The null hypothesis was therefore, rejected and inference drawn was that, the amount of variation in students' maximization of their learning behaviours based on effective instruction, classroom activities and formative assessment is statistically significant.

The finding of the study showed that the amount of variation in the maximization of students learning behaviours attributed to effective instruction, classroom activities and formative assessment were 79, 41 and 18%, respectively. The high amount of variation attributed to effective instruction indicates that when instruction is effective, learners have the opportunity to take control of their own learning and optimally maximized their learning behaviours. The finding of the study is in accordance with the assertion of Slavin^[9] who noted that effective instruction involves students participating in well-planned and implemented learning that make them to become more successful both academically and behaviourally. This result show that adequate planning, managing and well delivered instruction enhanced learning. It also affirms, Martella and Nelson^[4] opinion that effective instruction does not only increase students academic performance but also lead to the maximization of learning behaviors.

The result also indicates that the amount of variation attributed to classroom activities was low. This implies that engaging students in small group work, quizzes in class discussions, debates, peer teaching, demonstrations and simulation exercises is weak. It is an indication that the lesson was not students-centred and learning was not maximized using classroom activities. If the classroom activities that are aimed at making students or learners do things and think about what they are doing are weak then the promotion of intellectual, social, emotional and

behavioral changes in the learner are reduced. In the light of this result, classroom activities that provide students with opportunities to share ideas, test their thinking and examine different perspectives on issues exposed to them by the teacher are inevitable. Increased number of challenging activities that engage all students in displaying creativity, critical thinking, problem solving and favourable study skills should be integrated into the learning content of students. In so doing, the maximization of students learning behaviours will be strengthened by teachers.

It was equally found that the amount of variation attributed to formative assessment was very low. This result is indicative that, the use of formative assessment to determine how learning is progressing and areas of possible improvement is not properly practice and is not well integrated into the teaching and learning process. This finding seems at variance with the assertion of Hanna and Dettmer^[13] who noted that teachers using formative assessment approaches and techniques are better prepared to meet diverse students needs through differentiation and adaptation of teaching to raise levels of student achievement and to achieve a greater equity of student outcomes. The low amount of variation attributed to formative assessment implies that there are minimal assessments of student progress, understanding and identification of learning needs from assessment result, as well as weak adjustment of teaching aimed at correcting misconceptions or errors. Finding from the study showed that, the amount of variation in students maximization of their learning behaviours based on effective instruction, classroom activities and formative assessment is statistically significant. This result can be summarized to mean that effective instruction, classroom activities and formative assessment combined together to produce significant students maximization of their learning behaviors.

CONCLUSION

Based on the findings, this study concludes as follows: There was a positive and direct relationship

between effective instruction, classroom activities, formative assessment and students maximization of their learning behaviors. The amount of variation in students maximization of their learning behaviors based on effective instruction, classroom activities and formative assessment is statistically significant.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made. Effectiveness of instruction that promote the maximization of students learning should be employed in the classroom. Teachers should increase the number of challenging activities that engage all students in displaying creativity, critical thinking, problem solving and favourable study skills as they learn the contents essential to life. Assessment that provides feedback to both teachers and students on the level of each students understanding and skills with respect to set standards should be used during instruction. Such assessment system should be geared towards maximizing students learning by pinpointing gaps in their knowledge and providing teachers with key information that would be used to adjust instruction accordingly, to best meet the needs of students.

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