

Question Types as Predictors of Academic Performance in English Language among Secondary School Students in Lagos Main Land, Lagos State, Nigeria

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Abstract

This study investigated teacher question types i.e. open ended question types and close ended question types otherwise known as divergence question types and convergence question types (evaluation, inference, problem solving, comparison, application and knowledge) as predictor of academic performance among senior secondary school students in selected local government area of Lagos state. The participants were two-hundred and fifty. Three research questions were raised and tested using Pearson Product Moment Correlation and Multiple Regression Analysis. An English language achievement test consisting of open ended question types and close ended question types was used to collect data. The findings revealed that there was significant positive relationships between inference question type ($r = 0.238, p < 0.05$); problem solving question type ($r = 0.229, p < 0.05$); knowledge question type ($r = 0.476, p < 0.05$) while there was no significant relationship between evaluative question type ($r = 0.118, p < 0.05$), comparison question type ($r = 0.152, p < 0.05$), application question type ($r = 0.019, p < 0.05$) on academic performance in English language among the participants. The result shows a coefficient of multiple correlations (R) of 0.996 and a multiple R square of 0.992. This means that six variables jointly accounted for 99.2% of the variance in the academic performance of students in English language. The independent variables made positive relative contribution to academic performance in English language in the following order: application question types ($\beta = .396, t = 67.721, p < 0.05$) followed by comparison question type ($\beta = .365, t = 54.764, p < 0.05$), followed by inference question types ($\beta = .296, t = 49.304, p < 0.05$) followed by problem solving question type ($\beta = .273, t = 41.326, p < 0.05$) followed by evaluation question type ($\beta = .237, t = 39.621, p < 0.05$) and finally knowledge question type ($\beta = .230, t = 39.531, p < 0.05$) in that order. Based on this the teachers should be allowed to attend in-service training on tests construction and the different types of questions so as to avoid setting questions that are based on lower order of thinking.

Keywords: Teacher question types, Academic performance, English language, Secondary school students.

Introduction

In this era of globalization and technological revolution, education is considered as a first step for every human activity. It plays a vital role in the development of human capital and is linked with an individual's well-being and opportunities for better living (Battle & Lewis, 2008). It ensures the acquisition of knowledge and skills that enable individuals to increase their productivity and improve their quality of life. This increase in productivity also leads towards new sources of earning which enhances the economic growth of a country (Saxton, 2009). Education is one of the major linchpins for both the economic and political wellbeing of a society. The quality of students' performance remains at top priority for educators. It is meant for making a difference locally, regionally, nationally and globally. Educators, trainers, and researchers have long been interested in exploring variables contributing effectively for quality of performance of learners. For instance Olukoya (2013) cited Aremu and Adika (2011) who affirmed that the academic performance is the fundamental premium upon which all teaching-learning activities are measured using some criteria of excellence. The researcher posited that the academic performance of the students can be determined based on the students ability and the teachers levels of understanding of that particular subject matter and the methodologies involved in teaching of the subjects.

Adedoyin (2010) states that teachers' question types are of significant values for many instructional purposes, eliciting student reflection and challenging deeper student understanding and engagement in the classroom. Teacher questioning is an indispensable part of teaching process with a reference to Cotton (1998). Questioning is second only to teaching in popularity as a teaching method and that classroom teachers spend between thirty to fifty percent of their instructional time conducting question sessions. And even "in some classrooms over half of class time is taken up by question-and-answer exchanges" (Richards & Charles Lockhart, 2000, cited in Shi-ying, 2011). Considering this great quantity of teacher talk in the class, the vital role of questioning stands for its quality component as a reflection of teaching. Vogler (2005) cited in Adedoyin, (2010) states that questions can monitor comprehension, help make connections to prior learning and can stimulate cognitive growth. However, good questioning is a skill of effective teaching which involves a good planning, higher cognitive thinking and creating cognitive improvement in the class. As Shulman

(1997) cited in Boaler&Brodie, (2004) indicates that the act of asking a good question is cognitively demanding; requires considerable pedagogical content knowledge. Ornstein and Lasley (2000) states that good questioning is both a methodology and an art, it necessitates teachers to know what and to whom they teach well.

According to the research, the type of initiating questions posed by the pre-service teachers influenced the possible range of students' responses and, subsequently, the types of follow-up questions the pre-service teachers posed (Groenke& Paulus, 2007). In the study conducted by Groenke et al, it was observed that the effect of teachers' questions on dialogic inquiry in the discussions using Computer-Mediated Communication (CMC) and resulted in that authentic initiation questions do seem to promote dialogic inquiry. The research conducted by Walker (2004) cited in Groenke & Paulus, (2007), discovered that challenge questions were effective in promoting and engaged student participation. Similarly, Boaler and Brodie (2004) stated that coding of teacher questions illustrates the importance of the different questions teachers ask in shaping the nature and flow of classroom discussions and the cognitive opportunities offered to students.

Open-ended questions are able to be used either in a higher cognitive sense (remembering and/or understanding in terms of exploring further into the argument) or in a higher cognitive sense (evaluation in terms of a challenge or objection to the argument). From this perspective, question types play a role as heuristic devices to promote dialectical reasoning. Particularly when the topic at issue that needs to be settled by argumentation requires fair views of consideration. Overall, high-quality (open-ended) questions are defined as questions that elicit student reasoning in terms of requiring students to analyze, predict, evaluate and create ideas when learning new concepts.

According to McNeill & Pimentel, (2009) opined that close ended questions ask for factual information or confirmation. This leads to memorizing new concepts using lower-order thinking processes rather than understanding them via higher-order thinking (reasoning processes).Close-ended questions that do not contain argument components and Bloom's revised higher-level components can be divided into two sub-types of close-ended questions; asking for factual information and asking for confirmation. These sub-types of close-ended questions were used for the analytical framework for the teacher questioning category. Lower-order thinking student responses in relation to teachers' sub-types of close-ended

questions were considered as one subtype: simple responses. This sub-type of lower-order thinking student responses was used for the analytical framework for the student response category.

According to White (1999) the cognitive level of each question types asked during class sessions needs to be assessed by the teachers. Lower cognitive level questions require students to recall information learned in the past, whereas higher cognitive level questions require students to process and potentially evaluate the subject matter. Therefore, teachers who ask questions mainly at the remembering level are not encouraging students to critically examine the content being taught. Remembering level questions need to be asked during class sessions for the purpose of providing feedback to the teachers regarding understanding of basic foundational information. However, the questions asked need not stop at the remembering level, even in introductory courses. Students need to be required to think critically about the subject by creating their own responses and evaluating criteria pertinent to the questions being asked by teachers. The use of various cognitive levels of questions is recommended during class sessions for greater development of cognitive skills. Teachers must begin to challenge students at the creating and evaluating levels of cognition during class sessions, so that students think-through topics rather than recall information.

Richard and Lockhart (2000) stated that convergent questions type encourage similar student responses, or responses which focus on a central theme. They do not usually require students to engage in higher-level thinking in order to come up with a response but often focus on the recall of previously presented information. Divergent questions are the opposite of convergent questions. They encourage students to provide their own information rather than to recall previously presented information. Questions that call for an opinion, a hypothesis or an evaluation are classified as divergent questions (Moore, 2009).

Convergent question type is when the students are taught that there is only one correct answer to a problem or question (Moore, 2009). Questions such as true and false or yes and no can also be classified as convergent questions because they only solicit one answer. Questions asked in a convergent manner are very important because they target the preliminary information that students need to address a more complex question (Moore, 2009). Convergent teaching is mostly centered on the teacher directly transmitting the knowledge to the students (Tomar & Sharma, 2005). The ability to learn the information

presented is assessed using standardized tests (Tomar & Sharma, 2005). Convergent thinking involves taking the different pieces of a particular topic and putting them back together in an organized, structured, and understandable fashion (Zent, 2001). Zent (2001) argues convergent thinking is an essential part of the outlining and organizing process.

The divergent types of question should be used frequently in the classroom because they encourage and promote students individual thinking. In fact, this type of learning and thinking has been associated directly with creative thinking. White (1999), because of the amount of thinking required to solve a problem in divergent ways encourage the students to think outside the box and explore various different solutions. This type of approach encourages students to be more actively engaged in the learning process since it requires a broader response than just a simple one word or brief answer (Moore, 2009). Divergent learning is classified as being student-centered and flexible, where the students are completely involved in their own learning (Tomar & Sharma, 2005). The students decide how to complete the assignments given by the teacher and what approach to take with them. Divergent question involves taking a topic and breaking it down into its individual parts (Zent, 2001). A divergent project may include a portfolio, a commercial to advertise a product, or other special projects that promote more than one answer to the problem that is given (Tomar & Sharma, 2005).

Kwon, Park, and Park (2006) looked at how divergent teaching can be applied to mathematics. Traditionally, especially in mathematics, students are taught that there is only one correct solution to a problem. Kwon et'al (2006) looked at the components of divergent question type –evaluation, inference, comparison, application and problem solving. It was discovered that through the use of open-ended problems in mathematics and coupled with open-ended questions, this can greatly increase divergent thinking skills. These types of questions were found to be particularly good for differentiated classrooms because they can be designed to encourage all students to use and demonstrate mathematical creativity (Kwon et'al, 2006).

Hence, this study investigated the influence of teacher question types (open ended and close ended or convergence and divergence) as a prerequisite for academic performance of students in English language in Lagos Mainland, Lagos State.

Statement of the problem:

In most schools today, the problem of teacher's inability to set questions that cut across the convergence and divergence types of questions become worrisome and cast aspersion on the quality of training the teachers are exposed to when in training. Because whenever the students are expose to divergent type of questions they failed woefully. It seems as if it is only convergent type of questions are the only questions the teachers were taught on how to construct when in school because the students are not capable of tackling the divergent questions and the teachers are not capable of constructing the divergent question leading to a negative influence on the academic performance of the students in both internal and external examinations. As a result of this, it implies that there are lots of wastages at all levels of our educational system and all these are due to poor academic performance. As a result of this, the questions that come to mind are: are the teachers aware of what kinds of questions produce creative responses? Are the teachers bothered about how the students' thinking habits differ if the teachers designed questions that have more than one correct answer? Also, what happened if the teacher would try to stop asking yes/no questions and try to stop asking questions that simply review factual information? Are the teachers feel the response of students' thinking habits if routinely ask for viable alternatives to standard ways of solving problems. Given this gap, this study intends to investigate the effects of teachers' question types as predictors of academic performance in English language among selected students in Lagos Mainland, Lagos State.

Purpose of the study:

The purpose of this study is to determine the relationship, the composite and relative contribution of teachers question types on academic performance of selected senior secondary school students in English language in Lagos Mainland, Lagos. Specifically the study seeks to:

1. Find out the relationship between question types and academic performance of selected senior secondary school students in English language in Lagos main land.
2. Investigate the composite contributions of question types on academic performance of selected senior secondary school students in English language in Lagos main land.

3. Investigate the composite contributions of question types on academic performance of selected senior secondary school students in English language in Lagos main land.

Methodology:

This study employed the descriptive research design of correlational type to achieve the purpose of the study. The population of this study comprised of senior secondary schools II students in Lagos mainland of Lagos State. The sample size consists of 250 (two hundred and fifty) senior secondary class two (SS2) students that were selected from the population of six (6) selected secondary schools from two local governments (Alimosho and IfakoIjaye) in Lagos Mainland, Lagos state. It is assumed that the selected samples have common characteristics of the population of the study. Based on this, an inference was drawn and generalization was made on the population of the study. Multi- stage random sampling was used in this study. The study made use of standardized English language achievement test prepared by West African Examination Council that contains both convergence and divergence items to gather sample of behaviour of the participants for the study. The researcher visited the selected six (6) schools in Lagos Mainland. The principal of each school were contacted upon arrival at the school for necessary permission and the principal promptly directed the researcher to the counsellor. The test was administered by the researcher with the assistance of the counsellor to the students. The objectives of the test was clearly explained to the testees to make sure they do their best and there after the answer paper were duly collected back by the researcher after the administration. Data were analyzed using Pearson Product Moment Correlation and Multiple Regression Analysis at $\alpha = 0.05$ level of significance.

Research Questions

RQ1: What are the relationships that exist among evaluation, inference, problem solving, comparison, application and knowledge on academic performance of selected secondary schools students in English language in Lagos Mainland, Lagos State?

RQ2: What is the joint contribution of evaluation, inference, problem solving, comparison, application and knowledge on academic performance of selected secondary schools students in English language in Lagos Mainland, Lagos State?

RQ3: What is the relative contribution of evaluation, inference, problem solving, comparison, application and knowledge on academic performance of selected secondary schools students in English language in Lagos Mainland, Lagos State?

Results

RQ1: What are the relationships that exist among evaluation, inference, problem solving, comparison, application and knowledge on academic performance of selected secondary schools students in English language in Lagos Mainland, Lagos State?

Table1: Summary of Correlation Matrix showing the Relationship between the Independent and Dependent variables among Respondents.

	1	2	3	4	5	6	7
Academic Performance	1.000						
Evaluation	0.118	1.000					
Inference	0.238**	0.261	1.000				
Problem solving	0.229**	0.257	0.458	1.000			
Comparison	0.152	0.112	0.153	0.102	1.000		
Application	0.019	-0.017	0.012	0.160	0.074	1.000	
Knowledge	0.476**	0.530	0.637	0.698	0.561	0.312	1.000

** Correlation significant at 0.05 level

Table 1: above reveals that there was significant relationships between each of the independent variables: inference question type ($r = 0.238$, $p < 0.05$); problem solving question type ($r = 0.229$, $p < 0.05$); Knowledge question type ($r = 0.476$, $p < 0.05$) while there was no significant relationship between evaluative question type ($r = 0.118$, $p < 0.05$), comparison question type ($r = 0.152$, $p < 0.05$), application question type ($r = 0.019$, $p < 0.05$) on academic performance in English language among the participants.

RQ2: What is the joint contribution of evaluation, inference, problem solving, comparison, application and knowledge on academic performance of selected secondary schools students in English language in Lagos Mainland, Lagos State?

Table 2: Summary of Multiple Regression Analysis on joint contribution of the variables

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.996	0.992	0.992	0.495

Summary Regression ANOVA

	Sum of Squares	df	Mean Square	F	P	Remark
Regression	7482.19	6	1247.03	4.988	0.000	Sig
Residual	57.10	243	0.25			
Total	7539.29	249				

The results from Table2 shows a coefficient of multiple correlations (R) of 0.996 and a multiple R square of 0.992. This means that 99.2% of the variance in the academic performance in English language among participant is accounted for by all the six predictor variables, when taken together. The significance of the composite contribution was tested at $p < 0.05$ using the F- ratio at the degree of freedom ($df = 6/243$). The table also shows that the analysis of variance for the regression yielded a F-ratio of 4.988 (significant at 0.05 level). This implies that the joint contribution of the independent variables to the dependent variables was significant and that other variables not included in this model may have accounted for the remaining 0.8% variance.

RQ3: What is the relative contribution of evaluation, inference, problem solving, comparison, application and knowledge on academic performance of selected secondary schools students in English language in Lagos Mainland, Lagos State?

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.218	.157		1.388	.167
	Evaluation	.982	.025	.237	39.621	.000
	Inference	1.002	.020	.296	49.304	.000
	Problem solving	1.001	.024	.273	41.326	.000
	Comparison	.986	.018	.365	54.764	.000
	Application	.978	.014	.396	67.721	.000
	Knowledge	.981	.025	.230	39.531	.000

a. Dependent Variable: academic performance

Table3 reveals the contribution of the six independent variables to the dependent variable, expressed as beta weights. The partial correlation coefficients of open-ended and close-ended question types (evaluation, inference, problem solving, comparison, application and knowledge) have positive effect with the academic performance in English language among participants. The positive value of the effects of convergence and divergence types of question (evaluation, inference, problem solving, comparison, application and knowledge) is actually determined by positive reinforcement of these six variables. Using the standardized regression coefficient to determine the relative contributions of the independent variables to the explanation of the dependent variables application question type ($\beta = .396$, $t= 67.721$, $p < 0.05$) is the most potent contributor to the prediction followed by the comparison question type ($\beta = .365$, $t= 54.764$, $p < 0.05$) followed by inference question type ($\beta = .296$, $t= 49.304$, $p < 0.05$) followed by problem solving question type ($\beta = .273$, $t= 41.326$, $p < 0.05$) followed by evaluation ($\beta = .237$, $t= 39.621$, $p < 0.05$) and finally followed by knowledge question type ($\beta = .230$, $t= 39.531$, $p < 0.05$) in that order.

Discussion of the findings:

In response to the research question one on pattern of relationship that exists between the independent variables (evaluation, inference, problem solving, comparison, application and knowledge) and the academic performance in English language among senior secondary school students in the selected Local Governments Area of Lagos. The results in Table1 indicated that there was significant relationship between teachers question types of inference, problems solving and knowledge question types. However, there was no significant relation on evaluation, comparison and application on academic performance in English language among the participants. This finding is line with findings of White (1999) that divergent types of question encourage and promote students individual thinking. Therefore, because of the students are used to low order type of questions that require less thinking the learners are able to perform well. But reverse is the case in divergent question types which require the students to think outside the box and explore various different solutions. Because this type of approach encourages students to be more actively engaged in the learning process since it requires a broader response than just a simple one word or brief answer (Moore, (2009), Tomar & Sharma, (2005)).

In response to the research question two which asks whether there is any joint effect of the independent variables on the academic performance among senior secondary school students in selected Local Government in Lagos Mainland. The result showed that there was significant joint effect of the independent variables on academic performance. This finding was in line with findings of Olukoya (2013) who discovered significant composite contribution in a study carried on effect of questioning skill sensitization strategy on types, quality, quantity of teachers' questions and students' achievement in mathematics among the selected individuals.

The result in Table3 on the relative effect of each of the variable was also significant. In all academic work as a whole, it is revealed that the degree of teacher question types (evaluation, inference, problem solving, comparison, application and knowledge) is very relevant to an actualization of academic performance among senior secondary school students. The finding is consistent with who found that questions played an important role in every classroom-both students' questions and teacher questions. Teacher can create an active learning environment by encouraging students to ask and answer questions.

Conclusion:

This research work has established that, there is a significant relationship between comparison and knowledge question types on students' academic performance in English language. However, there are no significant relationships between evaluation, application and inference, problems solving teachers question types on academic performance of students in English language. The independent variables, when combined together had positive effect on academic performance. Also, the independent variables had significant relative contribution to dependent variable. Therefore, teachers should cultivate the habits of constructing questions that cut across all the types of question and most especially the questions that require higher order of thinking. This will help the learners to perform well in both internal and external examination and it will go a long way to enhance academic performance in English language and in all other subjects.

Recommendations:

Base on the findings of the study the following recommendations were made:

- (i) Opportunities for teachers' development should be provided such as workshops,

seminars and in-service training and an intensive on-the-job training on question type construction.

- (ii) Professional and qualified teachers must be recruited to teach in schools.
- (iii) Education should be properly funded by authorities and proprietors. Corporate organizations and individuals should collaborate with the government to provide qualitative education that will meet the future challenges.
- (iv) School internal professional development on questioning skill be organized at the beginning of every session for practicing teachers.
- (v) There is the need to emphasise the development of questioning skill during pre-service training of teachers especially during subject method courses.
- (vi) Government at all levels must formulate policies that will encourage teachers to put in their best in terms of motivation.

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