

Prior Knowledge Activation and Academic Achievements of Secondary School Students in English Language

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ABSTRACT

The study investigated the effects of Prior Knowledge Activation on Academic Achievements of Junior Secondary School Students in English Language in public Secondary School in Ekiti State, Nigeria. The research design adopted in the study was Pretest-Posttest Quasi- experimental. The sample for the study was one hundred and sixty (160) Junior Secondary School two students drawn from the three senatorial districts of Ekiti State with the a total population 91,417 Junior Secondary School two students in 184 public secondary schools using multi stage and stratified random sampling techniques. The instrument used to collect relevant data from the subjects was a 50-question item drawn to cover concepts like summary, meanings of words, comprehension passages and vocabulary development. The instrument was tagged "Prior Knowledge Activator Questions" (PKAQ). The reliability of the instrument was determined through a test-retest method with the reliability coefficient of 0.85. Three null hypotheses were tested at 0.05 level of significance. The data collected were analyzed using descriptive analysis and inferential statistical analysis of Analysis of Covariance (ANCOVA). The results of the analyses showed that there was a significant difference in the posttest scores of the experimental groups and control groups as a result of the exposure of the experimental groups to different instructional strategies. The findings also showed that the experimental groups could digest vocabulary in passages better than the control group which aided their reading comprehension, giving appropriate answers to reading passages than the control group. Based on the findings of the study, conclusions and recommendations were made.

Keywords: Prior Knowledge, activation, prior knowledge activation and academic achievement.

Introduction

An average individual within a contemporary society believes that education is the basic instrument through which a nation can meet up with the global challenges. This account for various reasons why families strive despite seemingly financial odds to educate their children in order to meet the yearnings of their micro society which later affects the larger one. It is not only the individuals that are left with the pursuance of education, governments too at different levels contribute greatly to education in order to reduce ignorance and primitivity and promote development and awareness.

Egbochuku and Iyamu (2000) defines education as a vital tool, a vehicle for sound change, a prerequisite for societal and national development and the only hope of any nation in transforming the economy and in creating good lives for its citizens. This definition summarizes the essence of education in any developing country like Nigeria.

It is on this basis that the National Policy on Education NPE (2004) emphasizes that: "Education will continue to be highly rated in the national development plans because education is the most important instrument of change as any fundamental change in the intellectual and social outlook of any society has to be preceded by education revolution".

This policy statement of Nigeria as a nation gives a clear focus to what education should attain. It is on this background that governments have their clearly stated objectives of education at different levels with designed curricular.

These learning contents in form of curricular are driven with English Language because of the peculiarities of linguistic structures of the nation. Nigeria, a nation that has three (3) major languages Igbo, Yoruba, Hausa, with none that is ready to step down for others being used as the official language. This invariably accords English Language a prestigious and unrivalry position among other major languages in Nigeria. It is an official language, language that unites all different ethnic groups and it has become a language that everybody strives to learn as a second language. It is important to stress that most Nigerian learners of English Language are either bilingual or multilingual who have accustomed themselves to their

mother tongues and possibly other major languages. This state has a lot of pedagogical implications in the teaching and learning of English Language right from the elementary levels to the tertiary levels. It therefore calls for conscious efforts of teachers to teach English Language effectively such that learners will grasp what they are being taught.

In education, a good background matters, so it is in English Language, for this reason, a number of crucial steps need to be taken so that learning can take place.

In the principle of education, teaching methods, which an average teacher must have undergone in an ideal teaching situation, previous knowledge is emphasized as the pre-requisite for new topics. It is expected without any compromise that every professional teacher must ensure that the prior knowledge of the concepts to be introduced must be established. This is important because it serves as the solid foundation for the new concepts that are introduced and it makes key words, easy vocabulary development and quick memory achievable.

Essentially, prior knowledge for this study is the total sum of previous learning experiences of a learner in English Language.

Marzano (2004) defines prior knowledge as what students already knew about a topic, it is one of the strongest predictors of how well they will learn new information in that particular subject area. Ehren (2005) views prior knowledge as a filter through which new information is encountered.

Prior knowledge affects the construction of meanings, it allows students to think deeply within themselves and brainstorm among themselves. It gives teachers an objective insight into those areas of strengths and weaknesses of learners, those concepts that they have fully grasped, those that need partial teaching and those that need to be re-taught completely are known to teachers.

Reading and writing are formal skills that are taught to learners. The former is receptive while the latter is productive. Both need competent hands to handle them.

Oyinloye (2002) sees reading as central to learning and academic success. Nnadi (2008) emphasizes the importance of reading declares that “reading makes a man, stop reading, stop learning”.

One major important issue in reading is comprehension. It is not every learner that reads that understands; otherwise, students would not have being failing examinations. Reading comprehension is the ability to read text, process it and understand its meanings. It involves processing information that we have read and understand its meaning. This is a complex process with three levels of understanding: literal meaning, inferential meaning and evaluative meaning.

It has been observed that learners most especially in public secondary schools in Ekiti State seem not to have read to the point of comprehension because of difficulties encountered during reading which affect the construction of meanings of words, giving correct answers to reading comprehension questions and summarizing the gist of passages without losing the major contents as a result of non-tapping of their prior knowledge in English Language by their teachers. These difficulties affect their comprehension, hence, their poor academic achievements in English Language.

The study raised a general question:

Can prior knowledge of students be properly activated for better academic achievements in English language?

Research Questions

Based on the level of academic achievements of learners and challenges encountered by learners of English Language within the context of Nigeria, the study raised the following questions:

- i. Will activation of prior knowledge of students have any impact on students' posttest achievements in English Language?
- ii. Will students whose prior knowledge were activated achieve better in giving appropriate answers to reading comprehension in post-test than those whose prior knowledge were not activate?
- iii. Will students whose prior knowledge were activated achieve better in vocabulary development in post-test than those whose prior knowledge were not activated?

Research Hypotheses

The above research questions were translated to research null hypotheses at 0.05 level of significance.

- i. There is no significant difference between the posttest of the experimental groups in prior knowledge activation the control group in English Language.
- ii. There is no significant difference between the posttest of the experimental groups in writing the appropriate answers to reading comprehension passages and the control group in English Language.

- iii. There is no significant difference between the posttest of the experimental groups in vocabulary development and the control group in English Language.

Methodology

The research design for the study was a quasi-experimental design of pretest- posttest randomized control group with independent variables (semantic mapping, brainstorming and KWL strategies) in the dependent variable (students' achievement)

The research design could be represented thus:

O ₁	X	O ₂	(Experimental group 1 KWL)
O ₃	X	O ₄	(Experimental group 2 Brainstorming)
O ₅	X	O ₆	(Experimental group 3 Semantic Mapping)
O ₇	-	O ₈	(Control group)

Where O₁, O₃, O₅ and O₇ were pretest while O₂, O₄, O₆ and O₈ were posttest. The X represented treatment for the experimental groups while - represented no treatment for the control group. The estimated population consisted of 184 public secondary schools in both urban and rural areas in Ekiti State. The total population of students in public secondary schools was 91,417. The sample for the study was one hundred and sixty (160) Junior Secondary School two students drawn from the three senatorial districts of Ekiti State using multi stage and stratified random sampling techniques. The first stage was the selection of three senatorial districts: Ekiti South, Ekiti North and Ekiti Central. The second stage was the selection of local governments within the senatorial district while the third stage was the selection of three schools for the experimental groups and one school from Ekiti central for the control group. The last stage was the random selection of samples in Junior Secondary Schools, precisely, Junior Secondary School 2.

The instrument used to elicit information for the study was a 50-question item drawn to cover concepts like summary, meanings of words, comprehension passages and vocabulary development. The instrument was tagged "Prior Knowledge Activator Questions" (PKAQ). The instrument contained fill in the gaps and multiple choice questions. The instrument gave adequate instructions on what students were expected to do and the duration was specified.

The validity of the instrument was determined using face and content validity. Experts in Language Education and Test and Measurement were consulted, their corrections were effected before the instrument was administered. The reliability of the final instrument was determined through a test-retest method. The instrument was administered on a group of forty students who did not partake in the study and it was re-administered at the interval of two weeks. The data collected were analyzed using Pearson Product Moment Correlation Coefficient and the instrument yielded a reliability coefficient of 0.85 which was considered high enough for reliability.

The experimental procedure was in phases: pre-treatment phase of administering the pretest to both the experimental and control groups. Treatment phase of nine weeks using three different strategies for the experimental groups while the control group, an intact class in a school, continued with the conventional teaching. The last phase was the post-treatment phase of administering the post-test to determine the effect(s) of treatment on the experimental groups and the control group.

The data collected were analyzed using descriptive and inferential statistics. Specifically, analysis of covariance (ANCOVA), bar graph were used to test the three hypothesis at 0.05 level of significance

Results

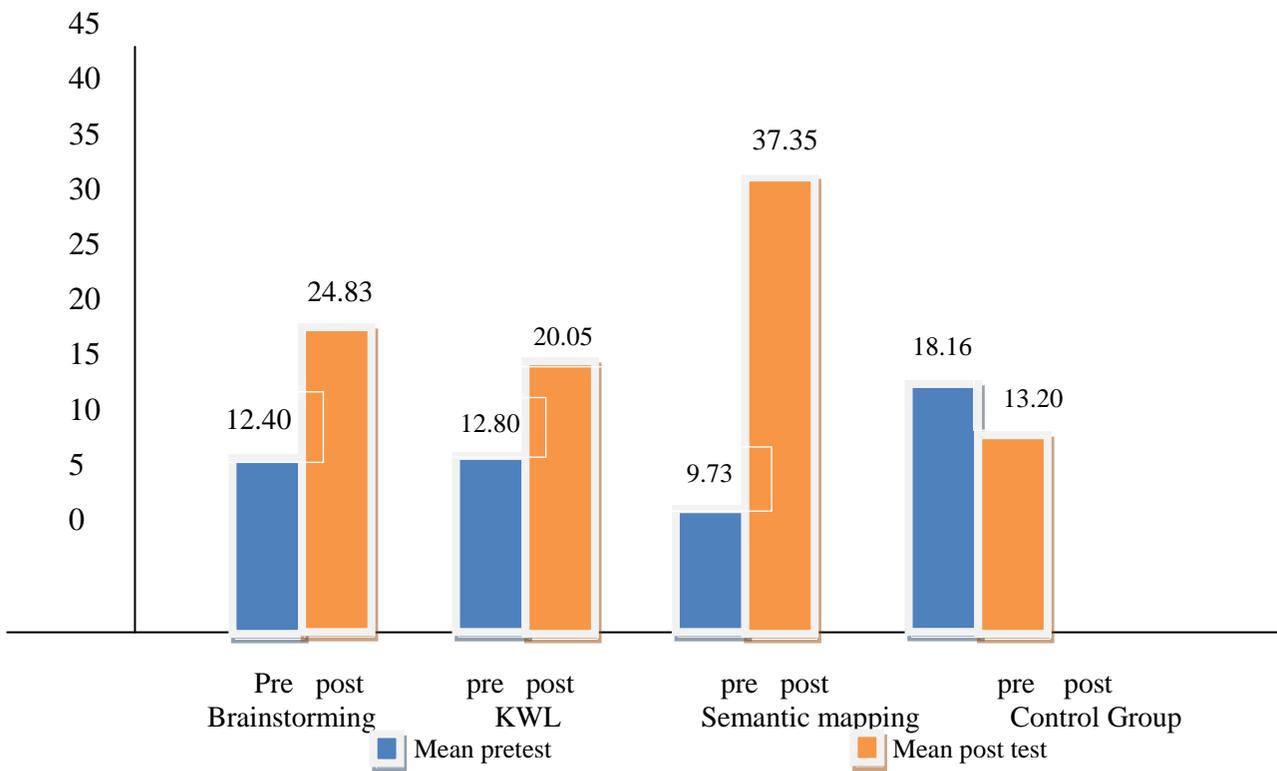
Descriptive Analysis

General Question: Can prior knowledge of students be properly activated for better academic achievements in English Language?

Table 1 : Summary of Role of Prior Knowledge in Learning New Concepts

Source	Pretest Mean	Standard Deviation	Posttest	Standard Deviation
Brainstorming	12.40	4.477	24.83	7.078
KWL	12.80	5.936	20.05	8.180
Semantic mapping	9.73	4.230	38.35	6.451
Control group	8.16	12.276	13.20	7.254

Figure 1: Graphical representation of four knowledge in learning new concepts



The table and the graph above revealed the pretest and mean scores of Brainstorming to be 12.40 and SD 4.477 with post mean scores of 24.83 and SD of 7.078 while pretest mean scores of KWL is 12.80 and SD 5.936 with posttest mean scores of 20.05 and SD 8.180. The table also showed the pretests mean scores of semantic mapping 9.73 and SD 4.230 with posttest mean scores of 38.35 and SD 6.451 while pretest of the control group is 18.16 and SD 12.276 with posttest of 13.20 and SD 7.254.

Hypothesis 1: There is no significant difference between the posttest of the experimental groups in prior knowledge activation and the control groups in English Language.

Table 2:

Summary showing ANCOVA of the Experimental and Control Groups in Prior Knowledge Activation.

Source	Type III sum of square	df	Mean square	F-cal	F-tab	Result
Corrected model	16969.012	4	4242.253	136.359	2.37	*
Intercept	1612.709	1	1612.709	51.838	3.84	*
Covariate (pretest)	3416.993	1	3416.993	109.833	3.48	*
Group	2611.317	3	870.439	27.979	2.60	*
Error	4822.182	155	3.111			
Corrected Total	21791.194	159				
Total	114769.000	160				

* == Significant at 0.05

The table 2 revealed that F_{cal} of 27.979 for the group (treatment) is greater than F_{tab} of 2.60. The result showed that the strategies of instruction produced a significant effect on the posttest mean scores of students when the covariate effect (pretest) was statistically controlled. The corrected model column was significant at F_{cal} of 136.359 which was greater than F_{tab} of 2.37. This means that brainstorming, KWL and semantic mapping strategies accounted for the difference in the posttest achievement scores of the student.

Table 3 : Sheffe's Posthoc Test Analysis Showing Differences in Mean Scores of Students in Overall Scores in Experimental and Control Groups.

Mean	Groups	Group1 Brainstorming	Group 2 KWL	Group3 Semantic Mapping	Group4 Control
24.83	Brainstorming		*	*	*
20.05	KWL				*
38.35	Semantic Mapping				*
13.20	Control				*

* Denotes pairs of groups with significant difference at 0.05. The * value in the table 3 revealed the significant difference between the posttest mean scores of students that were exposed to Brainstorming, KWL and Semantic mapping strategies and the Control group. Therefore, hypothesis 1 is rejected.

Hypotheses 2 : There is no significant difference between the posttest of the experimental groups in writing appropriate answers to reading comprehension passages and the control group in English Language.

Table 4: Summary Showing ANCOVA of the Experimental and Control Groups in Writing Appropriate Answers to Reading Comprehension passages.

Source	Type III sum of square	Df	Mean square	F-cal	F-tab	Result
Corrected model	1691.541	4	422.885	94.407	2.37	*
Intercept	137.557	1	137.557	30.709	3.84	*
Covariate (pretest)	537.472	1	537.472	119.988	3.84	*
Group	252.598	3	84.199	18.797	2.60	*
Error	694.303	155	4.479			
Corrected Total	2385.844	159				
Total	14031.000	160				

* == Significant at 0.05

The result of the analysis on table 3 indicated that f.cal 18.797 is greater than f.tab 2.60 for the group which was significant at 0.05 alpha levels. This indicated a significant difference on the posttest scores of students in experimental and control groups in giving appropriate answers to reading comprehension passages.

Table 5: Sheffe's Posthoc Test Analysis Showing Differences in Students academic achievements in reading comprehension.

Mean	Groups	Group1 Brainstorming	Group 2 KWL	Group 3 Semantic mapping	Group 4 Control
8.00	Brainstorming			*	*
7.55	KWL			X	X
12.93	Semantic mapping				X
5.65	Control				

X Denotes pairs of groups with significant difference at 0.05.

The X value in the table 5 revealed the significant difference between the post-test mean scores of students Exposed to Brainstorming, KWL and Semantic mapping strategies and the Control group. Therefore, hypothesis 2 is rejected.

Hypothesis 3

There is no significant difference between the posttest of the experimental groups in vocabulary development and the control group in English Language.

Table 6**Summary showing ANCOVA of the Experimental and Control Groups in Vocabulary Development**

Source	Type III sum of square	df	Mean square	F-cal	F-tab	Result
Corrected model	847.197	4	211.799	62.933	2.37	*
Intercept	232.75	1	232.75	69.159	3.84	*
Covariate (pretest)	332.378	1	332.378	98.762	3.84	*
Group	276.648	3	92.216	27.401	2.60	*
Error	521.647	155	3.365			
Corrected Total	1368.844	159				
Total	5419.000	160				

* == Significant at 0.05

The table revealed that F_{-cal} 27.401 for the group which is treatment is greater than F_{-tab} of 2.60 which showed a significant difference at 0.05 level. The result showed the strategies employed for the instruction produced a significant effect on achievements of students when covariate effect (pretest) was statistically controlled.

Table 7: Sheffe's Posthoc Test Analysis Showing Differences in Mean Scores of Students in vocabulary development.

Mean	Groups	Group1 Brainstorming	Group 2 Kwl	Group3 Semantic mapping	Group4 Control
6.88	Brainstorming			*	*
7.55	KWL			*	*
2.93	Semantic mapping				*
5.65	Control				

The value in table 7 showed a significant difference between the posttest mean scores of students exposed to Brainstorming, KWL, Semantic mapping strategies and the Control group in vocabulary development. Therefore, hypothesis 3 is rejected.

Discussion

The study examined prior knowledge activation and academic achievements of secondary school students in English language. The result of the study showed that, there was a significant difference in the posttest scores of the experimental groups and control groups as a result of the exposure of the experimental groups to different instructional strategies. The findings showed that the experimental groups could digest vocabulary in passages better than the control group which aided their reading comprehension, giving appropriate answers to reading passages than the control group. It is assumed that the different strategies employed by the researcher might account for the differences.

This position aligns with Brooks (2007) which stated that, although one particular strategy may be well suited for one reader, it may not work for another". It is on this basis that teachers need to assess learners' prior knowledge to determine different instructional strategies to be used.

It is also a consensus that background knowledge is a critical factor in learning and an essential element of acquiring new knowledge (Fisher & Frey 2009, Kamil Borman, Dole, Kral, Salinger and Torgeser, 2008).

The findings were in support of Pardo (2004) who opined that activation of prior knowledge makes up a great amount of the process of reading comprehension.

Since background is critical to reading, teachers need to fashion not different instructional strategies that can activate prior knowledge of learners.

There is high correlation in the research literature of word knowledge, vocabulary with reading comprehension which indicates that, if students do not adequately and steadily grow their vocabulary knowledge, reading comprehension will be affected (Chall and Jacobs, 2003). Teachers of English Language should have this understanding to know that elaborate teaching in vocabulary development of students will have positive impacts on reading comprehension through diversified teaching techniques.

The study submitted that those experimental groups performed better in vocabulary development than the control group. Vocabulary experts agree that adequate reading comprehension depends on a person already between 90 and 95 percent of the words in a text(Hirsch 2003) knowing that percentage of words allows the reader to get the main thrust of what is being said and therefore to guess correctly what the unfamiliar words probably means. Experimental groups that were exposed to different strategies of activating their prior knowledge in vocabulary performed better than the control group.

Conclusion

From the findings of this study, there was a clear distinction in the academic achievements of students whose prior knowledge were activated in the overall performance in English language. Those experimental groups whose prior knowledge were activated performed better in reading comprehension and vocabulary development than the control group.

Recommendation

The study therefore recommended that, teachers should endeavour to activate students prior knowledge before new concepts are introduced in English Language using different instructional strategies.

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It's kind of fun to do the impossible.

~ Walt Disney