EFFECT OF CONVERGENT THINKING INSTRUCTIONAL STRATEGY ON SECONDARY SCHOOL STUDENTS ACADEMIC ACHIEVEMENT IN EZEAGU LOCAL GOVERNMENT AREA OF ENUGU STATE

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Abstract

The purpose of this study was to determine the Effect of Convergent Thinking Instructional Strategy on Secondary School Students Academic Achievement in Ezeagu Local Government Area of Enugu State. Two research questions and three hypotheses guided the study. Pretest-posttest non randomized control group design was adopted for the study. The study was conducted in Ezeagu Local Government Area of Enugu State, where a sample of (242) senior secondary school two (SS 2) students was drawn from 6 intact SS2 classes in 3 secondary schools. The sample consist of (151) female and (91) male students. The sample also was made up of (130) students in the experimental group and (122) students from the control group. Instrument used for data collection was English Language Achievement Test (ELAT). ELAT was made up of 30 items. It was validated by three research experts. ELAT gave a reliability coefficient of .71 obtained using Kudar Richardson 20 Formular. Research questions were answered using mean and standard deviation. Hypotheses were tested using Analysis of Covariance (ANCOVA). Major findings of the study showed that students taught English Language with Convergent Thinking Instructional Strategy achieved more in English Language than their counterparts taught same topics with expository method. Male and female students' taught English Language with Convergent Thinking Instructional Strategy did not differ significantly in their mean achievement scores. It was recommended that Convergent Thinking Instructional Strategy be used in teaching secondary school English Language.

Keywords: Thinking, Convergent thinking, Achievement, Academic Achievement.

Introduction

Secondary education in Nigeria refers to the education given to the child after primary education and before tertiary education. Specifically, the broad goals of secondary education, according to the Federal Republic of Nigeria (2013) in the National policy on Education are to prepare the individual for useful living within the society and higher education. Hence, secondary education among other things, is expected to provide trained man power in the applied sciences, technology and commerce at sub-professional graves; foster national unity with an emphasis on the common ties that unite us in our diversity; raise a generation of people who can think for themselves, respect the views and feelings of others, respect the dignity of labour, appreciate those values specified under our board national goals and live as good citizens and provide technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development. Unarguably, one of the ways of achieving these laudable goals of secondary education is to enhance secondary school students' academic achievement.

AL-Gazir (2013) defined achievement as the process of bringing out or accomplishing something through effort, skill or course. Bell and Thompson (2012) averred that academic achievement generally suggests an achievement relating to education and scholarship. Awe (2011) added that academic achievement depicts student's performance on a standard of measurement such as performance test, skill test, analytical thinking test, etc. Academic achievement can therefore be described as the gain in knowledge of students as result of taking part in a learning activity or programme. According to Kuntu and Pedro (2013) academic achievement is a result-oriented construct that encapsulates the extent of performance of a describe task. More specifically, academic achievement in this study refers to achievement in secondary school English Language. This achievement was measured using English Language Achievement Test (ELAT). The ELAT was used to measure the students' gain in knowledge as a result of been taught English Language. Bell and Thompson (2012) as well as AL-Gazir (2013) averred that instructional strategy is major factor inhibiting secondary school students' academic achievement. They further posited that secondary

school teachers should adopt instructional strategies that develop their students' thinking in order elicit the desired academic achievement from the students.

Moreso, Alio (2004) pointed out that the most important responsibilities of the teachers is being able to pass on information/learning experience to the students in such a manner that learning will take place most successfully by stimulating the learners thinking appropriately. Effective learning therefore, depends on appropriate thinking. The above implies that the classroom teacher has to plan his lesson in such a way as to stimulate correct thinking in the learners. Thinking is a natural endowment which enables man to find solutions to problem situations. Thinking is the act of using one's mind to produce thoughts and ideas. To think of a thing means to consider that thing critically before making decision, (Anyafulude in Nneji, 2016). De Bono (2002) in Clauss (2012) defines thinking as the act of using one's mind. In other words, thinking involves forming thought, reasoning, judgment, opinion. It is an unobservable activity that links or meditates observable stimuli and responses. Thinking is conceived as concerning the investigation of properties and effect of meditation (Harns, 2001 in Ika, 2013). Different categories can be used to distinguish one form of thinking from another. Thinking in human beings can be classified as convergent and divergent. This study was based on convergent thinking.

Convergent thinking according to Harris (2003) in Mbu (2012) involves the ability of the learner to assemble facts and organize them logically and sequentially with a view to finding one effective solution to a problem. De Bono (2002) in Njor (2013) in planning instruction stated that the convergent part of instructional planning comes when each new generated smaller concept is tracked back and tested against the original theme. Thus, in order for related ideas to be pertinent to the final development of a unit, each idea must have a direct relationship back to the central theme. As effective as convergent thinking instructional strategy may sound, researchers have reported conflicting findings on its efficacy especially in enhancing secondary school students' academic achievement. Hence, the need for more investigations to establish a definitive answer to the effect of convergent thinking instructional strategy on secondary school students' academic

achievement in English language. This is because English language is not only a compulsory subject in Nigerian secondary schools but also the language of instruction all through Nigerian educational systems. Thus, this study is most timely because improved academic achievement in English language, no doubt, will improve academic achievement in all other subjects.

Purpose of the Study

The purpose of this study was to investigate the Effect of Convergent Thinking Instructional Strategy on Secondary School Students Academic Achievement in Ezeagu Local Government Area of Enugu State. Specifically, the study aimed at investigating the Effect of Convergent Thinking Instructional Strategy on senior secondary school two (SS2) students';

i. achievement in English language

ii. achievement in English language with regards to students gender

Research Questions

The following research questions guided the study

1. What are the mean English language achievement scores of students taught English language with Convergent Thinking Instructional Strategy and their counterparts taught with expository method?

2. What are the mean English language achievement scores of male and female students taught English language with Convergent Thinking Instructional Strategy?

Hypotheses

The following hypotheses were formulated and tested at .05 level of significance

1. There is no significant difference between the mean English language achievement scores of students taught English language with Convergent Thinking Instructional Strategy and their counterparts taught with expository method.

2. There is no significant difference between the mean English language achievement scores of male and female students taught English language with Convergent Thinking Instructional Strategy.

3. There is no significant interaction between teaching strategy and students' gender on students' achievement in English language.

Methodology

The research design adopted in the conduct of this investigation was quasi-experimental design. Specifically the design was a pretest –posttest, nonequivalent control group design. The area covered in this study was Ezeagu Local Government Area of Enugu state. From were three (3) secondary schools were randomly drawn. Two intact SS2 classes were also randomly drawn from each of the (3) secondary schools, hence, a total of six (6) intact SS2 classes were used for the study. All the students in the (6) intact classes, numbering (242) served as sample for the study. The sample was made up of (130) students in the experimental group and (122) students in the control group. Also the sample was made up of (151) female and (91) male students giving a total of 242 students.

English Language Achievement Test (ELAT) was used to collect achievement scores, (pre and post). ELAT was made up of thirty (30) items. Each item had four options lettered A-D. Only one of the options was the correct answer. ELAT was validated by three research experts. After necessary corrections as directed by the experts, ELAT was confirmed to be valid. ELAT yielded a reliability coefficient of .71 obtained using Kudar Richardson 20 formular.

Experimental Procedures

The researcher trained the (3) regular English language teachers in the (3) secondary schools used for the study for a period of two weeks on the use of Convergent Thinking Instructional Strategy. Fore-most, the ELAT was administered to all the subjects of the study to collect the pre-treatment achievement scores. Thereafter, the treatment was administered for a period of six weeks. The experimental group in each school was taught the selected English language topics using Convergent

Thinking Instructional Strategy while the control group in each school was taught the same topics using expository method. All topics were drawn from SS2 English language scheme of work. At the expiration of the treatment period, the ELAT was re-arranged and administered to all the subjects of the study to collect the post-treatment achievement scores.

Research Questions were answered using mean and standard deviation. Test of hypotheses was done with Analysis of Covariance (ANCOVA) at .05 level of significance.

Results

Research Question 1: What are the mean English language achievement scores of students taught English language with Convergent Thinking Instructional Strategy and their counterparts taught with expository method?

Table 1: Pre and Post treatment achievement scores of the students

Group	n	Pre		Post	
		Mean	SD	Mean	SD
Experimental	130	32.31	11.0413	80.25	5.0019
Control	122	31.84	10.5201	60.80	8.4522

From table 1 above, the pre-treatment achievement mean score of experimental group was 32.31 while that of control group was 31.84. These suggest that both groups were almost having equal achievement in English language at the beginning of the experiment. In the post-treatment achievement score, experimental group had a mean of 80.25 while the control group had a mean of 60.80. Apparently, the two groups exhibited higher achievement after treatment than before the treatment. However, the post-treatment achievement mean score of the experimental was higher than that of the control group. Moreso, a lower standard deviation value of 5.0019 in the post-treatment achievement score for experimental group indicates that there were fewer extreme scores in the experimental group than the control.

Research Question 2: What are the mean English language achievement scores of male and female students taught English language with Convergent Thinking Instructional Strategy?

Table 2: Mean achievement scores of male and female students taught with Convergent Thinking Instructional Strategy (experimental group).

Group	n	Post-Treatment Achievement Scores	
		Mean	SD
Male	52	79.61	3.14
Female	58	81.13	4.04

In table 2, the post-treatment mean achievement score and standard deviation of the male students were 79.61 and 3.14 respectively. For the female students, the post-treatment mean achievement score and standard deviation were 81.13 and 4.04 respectively. Female students seem to have scored higher than their male counterparts. However, test of hypothesis 2 (table 3 below) showed whether the difference in their scores is significant or not.

Hypotheses Testing

H_O1: There is no significant difference between the mean English language achievement scores of students taught English language with Convergent Thinking Instructional Strategy and their counterparts taught with expository method.

H_O2: There is no significant difference between the mean English language achievement scores of male and female students taught English language with Convergent Thinking Instructional Strategy.

H_O3: There is no significant interaction between teaching strategy and students' gender on students' achievement in English language.

Table 3: ANCOVA Analyses of the students' Achievement Scores.

Source of variation	Sum of Squares	DF	Mean Square	F	Sig.	Decision
Corrected model	62113.44	2	31056.72	218.7159		
Intercept	110991.02	1	110991.02	781.650		
Strategy	3206.51	1	3206.51	22.5817	0.0001	Sig
Gender	928.22	1	928.22	6.5369	2.4121	Not Sig
Strategy*Gender	12.633	1	12.633	0.0889	1.3333	Not Sig
Residual	33511.00	236	141.9957			
Total	210762.823	242	870.9207			
Corrected Total	20006.133	241				

From table 3, strategy gave an f value of 22.5817 and this is significant at 0.0001. Since 0.0001 is less than 0.05 this means that at .05 level of significance, the f value of 22.5817 is significant. Therefore, hypothesis 1 is not accepted as stated. This indicates that there is a significant difference between the mean achievement scores of the experimental and control groups in favour of the experimental group. Similarly, the sum of squares arising from strategy (3206.51) when compared with the sum of squares arising from error (residual) (33511.00) indicates that the observed difference in the achievement scores of the experimental and control groups is due to the treatment administered in the study.

Gender gave an f value of 6.5369 and this is significant at 2.4121. Since 2.4121 is greater than 0.05, this means that at .05 level of significance, the f value of 6.5369 is not significant. Therefore, hypothesis 2 is not rejected as stated, indicating that there is no significant difference between the mean achievement scores of male and female students in the experimental group. More so, the sum of squares arising from gender (928.22) is highly insignificant when compared with the sum of squares arising from error (residual) (33511.00).

The interaction effect (strategy*gender) gave an f value of 0.0889 which is significant at 1.3333. Since 1.3333 is greater than 0.05, this means that at .05 level of significance, the f value of 0.0889 is

not significant. Hypothesis 3, therefore, is not rejected as stated because there is no significant interaction between teaching strategy and students' gender on students' achievement in English language in the study. Moreso, the sum of squares arising from strategy*gender (12.633) is not significant in comparison with the sum of squares arising from error (residual) (33511.00). Hence, any observed differences may be due to extraneous variable(s).

Summary of Findings

From the results presented above, it can be summarized that;

1. The students taught English language with Convergent Thinking Instructional Strategy achieved higher in English language than those taught with expository method.

2. Male and female students taught English language with Convergent Thinking Instructional Strategy exhibited equal achievement in English language.

Discussions of Findings

Research question one sought to know the mean achievement scores of the students in both experimental and control groups in both pretest and posttest. Table 1 presented the mean achievement scores and standard deviations of the students in both groups in pretest and posttest. Noteworthy is the fact that the mean pretest scores of both groups did not differ significantly. This suggests that both groups had similar entry behavior and achievement ability. Also, the wide gap between the mean pretest scores and the mean posttest scores showed that learning took place in both groups. However, the result presented in table 3 indicates that there was significant difference between the achievements of the groups. Hence, the experimental group achieved higher than the control group.

As sated earlier Awe (2011) defined academic achievement as the gain in knowledge of students as a result of taking part in a learning activity or program. Going by this definition, we can say, with certainty, that the achievement of the students was as a result of the treatment administered to

them. More so, extraneous variables were properly controlled. This implies therefore, that convergent thinking instructional strategy promoted higher achievement than the expository method. Interestingly, the standard deviation for the experimental group was very small, compared to that of the control group. This implies minimal or non-existence of extreme scores in the group taught with convergent thinking instructional strategy. The mean score is therefore, a true representation of the performance achievement of the entire class rather than the performance achievement of a few students in the group.

Research question two sought to know the mean achievement scores of male and female students in the experimental group in posttest. Table 2 showed the mean achievement scores and standard deviation of male and female students in the experimental group in the posttest. Table three further revealed that there was no significant difference between the mean achievement scores of the male and female students in the experimental group in the posttest. All these findings of this study support the findings of Clauss (2012) and Njor (2013). But the findings disagree with those of Mbu (2012) and Ika (2013). The disagreement in the findings of these two set of researches' may likely be traced to experimenter's ability in controlling extraneous variables. Also important is the experimenters' ingenuity in using the convergent thinking instructional strategy to suit possible peculiarities in their studies.

Recommendations

Based on the findings of this study, the following recommendations are deemed necessary:

1. Use of Convergent Thinking Instructional Strategy for teaching secondary school English language should be adopted by teachers in all secondary schools in Enugu State and beyond.

2. Periodic workshops and seminars should be organized for English language teachers on the proper use of Convergent Thinking Instructional Strategy for teaching English language.

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