Futures-Wheel Instructional Method on Secondary School Students' Academic Achievement and Retention in Economics

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Abstract

The study focused on effects of futures-wheel instructional method on secondary school students' academic achievement and retention in economics. The design of the study was pretest posttest, non-equivalent control group research design. A sample of 205 senior secondary school (SSSII) students were purposively selected and randomly assigned to experimental and control groups respectively. The instrument for data collection was a 32 Multiple Choice Economics Achievement Test (MCEAT). Data collected for the study were analyzed using mean and standard deviation to the research questions and the Analysis of Co-variance (ANCOVA) was used to test the hypotheses at .05 level of significance. The result of the study revealed that futures-wheel instructional method has significant effect on students' academic achievement and retention in Economics. The result of the study further revealed that there were no significant interaction effects between methods and gender on secondary school students' achievement in Economics. From the findings, it was recommended that teachers should use futures-wheel instructional method in teaching Economics since it has been found to be effective in enhancing students' achievement and retention in Economics. This will further enhance the implementation of Economics curriculum and students' achievement in secondary schools.

Keywords: future-wheel, instructional method, economics, achievement and retention

Introduction

The knowledge of economics is considered to be the bedrock upon which the economy of any nation thrives, grows and develops (Oko, 2014). This invaluable utility possessed by economics may have influenced its popularity among students who prefer it for a wide range of career options. Economics deals with the study of human behaviour, that is, how people earn their living, allocate scarce resources and make choices among alternatives for the satisfaction of their wants. It further focuses on the study of firms and government whose activities are geared towards production and distribution of goods and services

for the satisfaction of human wants (Yusuf, 2012). Economics is also fundamental in training the students to understand the world around them and contribute meaningfully to the growth and development of the society with the limited resources available.

It was in recognition of this all important role played by Economics among individuals, firms and government that the Federal Republic of Nigeria (FRN, 2014) outlined the objectives of teaching the subject at the senior secondary school level; to understand the basic economic principles and concepts as well as the tools for sound economic analysis; develop the skills and also appreciate the basis for rational economic decisions; contribute intelligently to discourse on economic reforms and development as they affect or would affect the generality of Nigerians; appreciate the role of public policies on national economy; understand the structure and functioning of economic institutions; become sensitized to participate actively in national economic advancement through entrepreneurship, capital market; appreciate the problems encountered by developing countries in their efforts towards economic advancement; and understand the role and status of Nigerian and other African countries in international economic relationship.

The above objectives have implications for both Economics students and the nation in general, in the sense that they form the basis for making the students self-reliant and useful citizens that can contribute significantly to the growth and development of the country. Agreeing with this, Finkelstein (2011) remarked that senior secondary school graduates will be making economic choices all their lives, as bread winners and consumers and as citizens and voters and they would need some capacity for critical judgment, whether or not they progress into higher institutions of learning. Thus, it is necessary to note that the objectives of Economics are very crucial and addresses the major economic issues of the country.

Despite how laudable and promising these objectives appear to be, teaching and retention of Economics concepts can only be result-oriented if the students are willing to learn and the teachers teach with the appropriate pedagogy and resources. Buttressing this, Oleabhiele and Mugu (2015) observed that researchers' concern has risen due to the fact that students' performance in the Secondary School Certificate Examination (SSCE) in Economics have remained poor. Also, the West African Examination Council Chief Examiner's Report (2017) revealed that the achievement of students in Economics seemed not to be encouraging. This poor performance of students in Economics, a subject considered to have direct utility for preparing the students for a wide range of career options such as Teaching, Business, Banking, Planning, Administration, Governance and so on is very disheartening. Several factors have been identified

to be responsible for this poor performance of students in Economics which among others include; inadequate qualified Economics teachers, dearth of instructional resources, attitude of the students, school conditions, teacher's emotional disposition and non-selection of suitable instructional method(s) (Oko, 2014, Oleabhiele, 2015; Ede & Oleabhiele, 2016). More, so, stakeholders blame the poor academic performance of the students on the inability of government to provide adequate instructional resources to schools, others see Economics teachers as being incompetent and unqualified to teach the subject. As a matter of fact, little or no attention has actually been given to pedagogical approaches employed by the teachers of Economics (Oko, 2021).

Teaching Economics in secondary schools today requires the use of democratic pedagogy that can reduce the authority of the teacher with less focus on delivery and advocates problem-based learning practices that are students-centred. Studies conducted by Oleabhiele (2017); Oko and Inya (2019) revealed that the application of traditional methods in teaching and learning of Economics is responsible for the poor achievement of students in Economics. This perhaps called for a change in pedagogical approach in order to enhance students' achievement in Economics. It is assumed that the effective teaching and learning of Economics is to a great extent dependent on the right selection and utilization of appropriate instructional method(s). It observed by the researchers that this has not been the case as it is observed that futures-wheel has not be employed in the teaching of Economics despite it improve performance in the teaching of other related subjects. Based on these assertions, the researcher deemed it fit to ascertain if the introduction of futures-wheel instructional method would help to address the issue of students' poor performance in Economics.

Futures-wheel instructional method according to Illang and Eteng (2012), is a method for graphical visualization of direct and indirect future consequences of a particular change or development. In the words of Glenn in Walcome (2014), futures-wheel instructional method consists of a term describing a change that is positioned in the center of the page. Consequences following directly from the change are positioned around the change and linked to it. More so, Mezieobi, Fubara and Mezieobi in Oko (2021) referred to futures-wheel instructional method as a mode of instruction that bases futuristic predictions of consequences of subject-matter, content, problems, actions, choices and decisions on today's prevailing consequences. It is a foresight method that provides a model of the future based on the consequences of an event or trend. However, futures-wheel requires a deep understanding of the problem domain being analyzed, so that the generated future model may be as accurate as possible.

In addition, futures-wheel instructional method is theoretically based on the works of social and cognitive constructivist theorists like Lev Vygotsky and Jerome Brunner who affirmed that learners are not 'tabula rasa' that are passive in the teaching-learning process as viewed by the behaviourists but are active learners and can construct their own ideas, with the concepts made known to them by the teacher (Oko, 2021). Further, he opined that when learners exchange ideas with peers and teachers, shared meanings are developed which also lead to effective development of communication skills, increased achievement and retention of concepts.

Retention is the amount of materials remembered overtime; it involves recognition and recall (Okurumeh, 2016). According to Merriam (2016), retention is the ability to retain things in mind, especially a preservation of the after effects of experience and learning that makes recall and recognition possible. Recall involves search of memory and then the comparison process once something is found. Recognition involves a process of comparison of information with memory. Recently, increased emphases have been placed on secondary school graduates retention rate as evidence indicates that students study and memorize concepts for the sake of passing exams. The quest to determine the appropriate instructional methods which would enhance retention of concepts by learners has produced a variety of models and corresponding techniques that guarantees the ability to retain old learning while one continues to acquire new knowledge (Egeti, 2013). It is, therefore, imperative to acknowledge that effective teaching, learning and retention of Economics concepts require the application of instructional methods that could be able to sustain the interest of the students and as well enhance their achievement in Economics.

Achievement can be said to mean the extent to which a particular objective/ goal has been accomplished. It can as well be regarded as the observable and measurable behaviour of students in a particular subject or activity (Oko &Inya, 2019). With regard to academics, Merriam (2016) defined achievement as the result gained by efforts put in the courses or subjects taken in schools or colleges. This result can be positive or negative as we would always anticipate. Similarly, Meibner, Weidinger and Wirthwein (2015) observed that academic achievement represents performance outcomes that indicate the extent to which a person has accomplished specific goals that were the focus of activities in institutional environment such as schools. However, achievement in Economics may be influenced by gender. This is because male and female are biologically different, though all cultures interpret and elaborate their inherent biological differences into a set of social expectations about what behaviour and activities are appropriate for them and what rights, resources and even

power they possess In the same vein, Eleje (2011) defined gender as the socially/culturally constructed characteristics and roles which are associated to males and females in any society. Also, Ridley and Novak in Oleabhiele (2012) reported that gender differences in Economics achievement at the senior secondary school level are due to differences in role and meaningful learning modes adopted by boys and girls. Having observed these situations of poor academic achievement and learning disparity among students, it becomes imperative to investigate if gender is a contributing factor in students' achievement when exposed to futures-wheel instructional methods. Therefore this study focused on the effect of futures-wheel instructional method on secondary school students' academic achievement and retention in Economics in Ebonyi State.

Research Questions
The following research questions guided the study.

1. What is the effect of futures-wheel instructional method on students' mean achievement scores in Economics?

2. What is the interaction effect of methods, gender on students' retention in Economics?

Hypotheses
The following null-hypotheses tested at .05 levels of significance guided the study.

Ho_1: There is no significant effect of futures-wheel instructional method on students' mean achievement scores in economics.

Ho_2: There are no significant interaction effects of method and gender on students' retention in economics.

Methodology
The study employed pretest posttest, non-equivalent control group research design. The study was carried out in Ebonyi State. Ebonyi State is located in the Southeast geopolitical zone of Nigeria. It is mostly dominated by the Igbo speaking tribe of Nigeria. The population of the study comprised all the 10,632 senior secondary school two (SSS2) students that offered Economics in the 2019/2020 academic session. The sample size for the study was 205 Senior Secondary two (SSII) students who offered Economics in the selected schools. Out of these students, 105 made up the experimental group (50 male and 55 female students). While 100 students made up the control group (50 male and 50 female students). The Purposive sampling technique was used to select four co-educational schools that had qualified Economics teachers

and also had been presenting students consistently for the past ten years in Senior Secondary School Certificate Examinations (SSCE) both for National Examination Council (NECO) and West African Examination Council (WAEC). The researcher purposely chose SSSII students because the students at this level were not preparing for any external examination and had been exposed to most of the content areas of Economics.

The instrument for data collection for the study was Multichoice Economics Achievement Test (MCEAT) developed by the researcher from the SSII students Economics scheme of work using Table of Specification. The EAT consisted of 32 multiple choice items. Each item had four options A-D which the students selected the correct option from the distractors. The instrument was rearranged, reshuffled and restructured twice to have three versions of the instrument thus EAT_1 for pre-test, EAT_2 for post-test and EAT_3 for retention. At the beginning of the experiment, EAT_1 was administered to both treatment and control groups as pre-test. After this, the scores of the students on the pre-test was recorded and safely kept. EAT_2 was rearranged, reshuffled and restructured and administered to the students at the end of the treatments as post-test and EAT_3 was re-administered after two weeks to assess their level of retention.

The instrument was content validated by three experts using SSSII Economics scheme of work. These experts vetted the items in terms of sentence structure, clarity, and adequacy of the instrument. After the content validation and modifications in line with the recommendations of the experts, the instrument was further subjected to item analysis where the item discrimination index, item difficulty and item distractors where determined. Based on this, 18 items out of the 50 items developed were dropped leaving 32 for the study. This helped to affirm the validity of the test as part of its psychometric properties. Also, the instrument (EAT) for the study was further subjected to reliability testing using Kuder-Richardson 20 (KR-20) with data obtained from 30 students who were used for trial-testing. A reliability coefficient of .74 was obtained, which implied a high internal consistency of the items that constitute the instrument.

The data collected from the pre-test and post-test achievement and retention scores of the students involved in the study were analyzed. Mean and standard deviation were used to answer the research questions while the Analysis of Covariance (ANCOVA) was used to test the null hypotheses at .05 level of significance. ANCOVA was considered appropriate for the study because it helped to partial out the initial differences that might occur between the two groups. The decision to reject or not to reject any null hypothesis was based on the P-value compared to the level of significance. Where the P- value was greater than .05 level of significance (P- value > .05 level of significance),

the null hypothesis was not rejected. But where the reverse was the case (P-value < .05 level of significance), the null hypothesis was rejected.

Results

Question 1—What is the effect of futures-wheel instructional method on students' mean achievement scores in Economics?

The data for answering research question 1 are presented in Table 1.

Table 1: **Mean and standard deviation scores of students in economics when taught using futures-wheel instructional strategy and lecture method**

Group	No. of students	Pre-test		Post-test		
		Mean	S	Mean	S	Mean Gain
Exp	105	40.71	4.83	46.77	5.12	6.06
Control	100	39.19	3.88	44.21	4.86	5.02

Exp = Experimental group, N = Number of Students, S = Standard Deviation

The data presented in Table 1 show that the students taught Economics using futures-wheel instructional method (experimental group) had a mean gain of 6.06 while those taught with lecture method (control group) had a mean gain of 5.02. This indicated that futures-wheel instructional method has a higher mean score of 6.06 on senior secondary students' achievement in economics in Ebonyi State. As a result of the observed difference, hypothesis 1 was tested at .05 level of significance to ascertain if the mean difference was significant.

Hypotheses 1

H_{01}: There is no significant effect of futures-wheel instructional method on students' mean achievement scores in Economics

The data for testing hypothesis 1 are presented in Table 2.

Table 2: **ANCOVA) of effects of futures-wheel instructional method on students' achievement in economics**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	338.709[a]	4	84.677	3.506	.009
Intercept	7826.104	1	7826.104	324.036	.000

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
PRETEST	62.328	1	62.328	2.581	.000
METHOD	25.088	1	25.088	1.039	.001
GENDER	5.647	1	5.647	.234	.029
Method P*	156.757	1	156.757	6.490	.012
Error	4806.247	200	24.152		
Total	437085.000	205			
Corrected Total	5144.956	204			

Data presented in Table 2 show a p-value of .001 which is less than the alpha value of .05. This indicates that there was a statistical significant effect of futures-wheel instructional method on senior secondary school students' achievement in Economics in Ebonyi State. Therefore, the hypothesis of no significant effect of futures-wheel instructional method on the senior secondary school students' achievement in Economics in Ebonyi State was rejected.

- Research question 2—What is the interaction effect of method and gender on students' retention in Economics?

The data for answering research question 2 are presented in Table 3.

Table 3: Mean interaction effect of method and gender on students' retention in economics

Gender	N	Posttest		Retention		Retention
		$\bar{X}$	SD	$\bar{X}$	SD	Mean gain
Male	100	48.89	6.25	61.86	6.36	12.97
Female	105	47.38	6.56	61.42	6.87	14.04
Differences		1.51	-0.31	0.44	-0.51	-1.07

Data in Table 3 show that male students taught Economics with futures-wheel instructional method obtained a mean posttest score of 48.89 with a standard deviation of 6.25 while their female counterparts had a mean posttest score of 47.38 with a standard deviation of 6.56. The difference between male and female mean and standard deviation pretest scores are 1.51 and -0.31 respectively. Hence, the male students had a slightly higher mean achievement

posttest score than their female counterparts in posttest score. Similarly, for the retention score, the male students had 61.86 and standard deviation of 6.36 while the female students had 61.42 with standard deviation of 6.87 given a difference in their retention scores to be 0.44. Meanwhile, the interaction effect of methods and gender on students' achievement in Economics was -1.07 which was less than one and very minimal. It thus implies that method and gender have no interaction effect on students' achievement in Economics. However, to determine if this observed difference was significant, hypothesis 6 was tested at .05 level of significance.

Hypotheses 2

$H_{02:}$ There are no significant interaction effects of gender and methods on students' retention in Economics

The data for testing hypothesis 2 are presented in Table 4

Table 4.12: ANCOVA of significant interaction effect of gender and methods on students' retention in economics

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	9611.427[a]	4	2402.857	30.912	.000
Intercept	9128.433	1	9128.433	117.435	.000
Postest	130.092	1	130.092	1.674	.198
Gender	52.975	1	52.975	.682	.411
Method	9193.531	1	9193.531	118.272	.000
Gender * Method	22.645	1	22.645	.291	.591
Error	15546.495	200	77.732		
Total	642698.000	205			
Corrected Total	25157.922	204			

Data presented in Table 4 show a p-value of .591 which is greater than the alpha value of .05. This indicates that there was no statistical significant interaction effects of instructional methods and gender on students' retention in Economics. Therefore, the null hypothesis of no significant interaction effects of instructional methods and gender on students' retention in Economics was accepted.

Discussion

The results of data analyses revealed that futures-wheel instructional method was better than conventional method in enhancing secondary school students' academic achievement in Economics. Specifically, the result revealed that the experimental group (futures-wheel) had a higher mean gain than the control group (conventional). The result further showed that futures-wheel instructional method has significant effect on students' achievement in Economics. The results were in line with that of Egenti (2011) which reported that futures-wheel instructional method when properly applied in teaching, enhanced students' achievement and promotes critical thinking among learners.

The results of the analyses on interaction effect of methods and gender on students' achievement in Economics indicated that there was no significant interaction effects of method and gender on students' achievement in economics. The result implied that the variations noticed in their mean achievements were not as a result of their gender since futures-wheel gives each student irrespective of gender, the opportunity to explore the gains of futures-wheel instructional method in the teaching-learning process. The effectiveness of this teaching method in Economics could be due to the approach and principles futures-wheel instructional method follows in achieving result. This agrees with the view of Ughele (2014) which noted that futures-wheel method promotes maximum interaction and enhances critical thinking among students. Cheng and Chu (2013) asserted that in using futures-wheel in teaching learning-process, the learner acquires information by transforming a stimulus material into a response that requires him or her to rearrange and elaborate on the material for better comprehension.

Conclusion/Recommendation

Based on the findings of the study, it was concluded that futures-wheel instructional method had a significant effect in the improvement of students' achievement in Economics. More so, it was also deduced from the findings that futures-wheel instructional method had no significant interaction on gender in terms of retention of concepts taught. Therefore, it was recommended Economics teachers should be encouraged in employing the futures-wheel instructional method in teaching Economics contents at all levels of education,

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