Effect of Mastery Learning on Secondary School Students' Academic Performance in Economics in Akwa Ibom South Senatorial District, Nigeria

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ABSTRACT

The study was carried out to examine the effect of mastery learning on secondary school students' academic performance in Economics in Akwa Ibom South Senatorial District, Nigeria. Quasi-experimental research design using a non-randomised pretest and posttest control group was used. Population of the study consisted of all the 26,598 Senior Secondary Two (SS 2) students in the 72 public secondary schools in the Senatorial District. Sample consisted of 197 SS 2 students selected from four intact classes in two public co-educational secondary schools in the study area. Purposive sampling technique was used for the selection. Economics Performance Test (EPT) was used for data collection. Content and face validation methods were used for validating this instrument. A reliability coefficient of 0.80 was obtained for the instrument using internal consistency method. Mean and standard deviation were used for answering research questions while analysis of covariance (ANCOVA) was used to test the hypotheses at .05 level of significance. The result of the analysis revealed that there is significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method. The result also revealed no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender. It was concluded that mastery learning do enhance secondary school students' academic performance in Economics in Akwa Ibom South Senatorial District. It was recommended that teachers should strive to use mastery learning strategy in teaching Economics concepts as this will help to concretize learning and hence facilitate academic achievement of students

KEYWORDS: Mastery Learning Instructional Strategy, Expository Teaching Method, Students Academic Performance and Economics

Introduction

In Nigeria, Economics is taught in senior secondary schools utilizing Economics senior secondary school curriculum. The guiding principle of the Economics curriculum is the need to equip graduates of senior secondary schools with the basic knowledge and skills that will enable them to better appreciate the nature of economic problems in any society and adequately prepare them for the challenges in the Nigerian economy. Therefore, the need for economic literacy is obvious because it is a subject that has relevance to everyday life and could prepare secondary school students for an entrepreneurial career. It helps in equipping secondary school students with entrepreneurial skills to becoming useful citizens even if they do not further their education. Thus, in order to realize the laudable objectives of Economics in secondary schools, there is need for students learning approaches and one of which is mastery learning.

Meta-cognitive techniques, including meta-knowledge and meta-learning, are tactics that allow a learner to take responsibility of his/her own learning in a highly meaningful way (Novak, 2003). (Novak, 2003). Meta-knowledge refers to knowledge that deals with the fundamental essence of knowledge and knowing, and meta-learning refers to learning that deals with the nature of learning, or learning about meaningful learning (Novak and Godwin, 2004). It is fundamentally about a process of being conscious of, and taking charge of, one's own learning (Biggs, 2005). (Biggs, 2005). Meaningful learning requires that learners can integrate new information into their current networks of idea and propositions in their cognitive structures (Malone and Dekkers, 2005).

One of such meta-cognitive methods to increase meaningful learning is mastery learning. Mastery learning is not a novel form of education. It is founded on the notion that all pupils can learn when supplied with conditions suited to their scenario. The learner must acquire a predefined level of mastery on one unit before they are permitted to move to the next. In a mastery learning context, students are provided precise feedback about their learning progress at regular intervals during the teaching time.

This feedback assist pupils recognize what they have learned well and what they have not learned well. Areas that were not learnt properly are allowed extra time to attain mastery. Only grades of "A" and "B" are authorized because these are the acknowledged levels of mastery. Traditional education maintains time constant and enables mastery to vary whereas mastery learning or systematic instruction holds mastery constant and allows time to change (Robinson, 2002). (Robinson, 2002). In mastery learning, students and teachers require time to re-teach, relearn and review. This must be addressed. Opportunities for quality time for students and for instructors to work individually or cooperatively, and for teachers and students to work together must be made accessible.

The mastery learning approach splits subject matter into units having predefined objectives or unit expectations. Students, alone or in groups, go through each lesson in an orderly way. Students must demonstrate mastery on unit examinations, generally 80 percent, before moving on to new content. Students who do not attain mastery get remediation through tutoring, peer monitoring, small group discussions, or more assignments. Additional time for learning is suggested for individuals requiring remediation. Students continue the cycle of learning and testing until mastery is reached. Block (2001) said that students with limited prior understanding of content had greater success with mastery learning than with standard methods of education.

Some research indicated that there are differential performances of male and female pupils. For instance, Kost et al. (2009) showed that male students did better than female in interactive Physics, whereas Anagbogu and Ezeliora (2007) discovered that female students performed better than their male counterparts when taught using practical method. However, Gambari et al. (2012) showed that gender had no influence on students' academic performance.

Wambugu and Changeiywo (2008) studied the impact of Mastery Learning Approach (MLA) on students' success in Physics. The study was Quasi-experimental and Solomon Four Non-equivalent Control Group Design was employed. The target group consists of secondary school students in Kieni East Division of Nyeri District. The accessible population was Form Two pupils at district co-educational schools in the division. Purposive sampling was employed to gather a sample of four co-educational secondary schools. Each school contributed one Form

Two class for the study therefore a total of 161 kids were engaged. The pupils were taught the identical Physics topic of Equilibrium and Centre of Gravity. In the experimental groups MLA teaching technique was employed whereas the Regular Teaching Method (RTM) was used in the control groups. The experimental groups were exposed to MLA for a period of three weeks. The researchers taught the teachers in the experimental groups on the technique of MLA before the treatment. Pretest was performed before therapy and a post-test after three weeks treatment. The tool utilized in the study was Physics Achievement Test (PAT) to assess students' achievement. The instrument was pilot tested to establish the dependability. The dependability coefficient α was 0.76. Experts confirmed their authenticity before being employed for data collecting. Data was evaluated using t-test, ANOVA and ANCOVA. Hypotheses were accepted or rejected at significant level of 0.05. The findings of the study indicated that MLA teaching style resulted in greater accomplishment but gender had no significant impact on their achievements. The researchers concluded that MLA is an effective teaching method, which physics teachers should be encouraged to use and should be implemented in all teacher education programmes in Kenya.

Mankilik and Dawal (2015) conducted a study on the effect of Mastery Learning Approach (MLA) on the performance of boys and girls in public primary schools in basic science and technology in Jos Metropolis Nigeria. Four research questions and four hypotheses were asked and formulated respectively. Non-equivalent pretest and posttest control group of quasi-experimental design was used. A sample of 175 primary six children (92 males and 83 girls), from two pilot scientific primary schools out of the population of 1,049 pupils from six pilot science primary schools in Jos Metropolis. Validated instrument for data collection was the Basic Science and Technology Performance Test (BSTPT), with a reliability value of 0.84 using Cronbach Alpha Coefficient. Research questions were answered with mean and percentages, while t-test was used in analyzing the hypotheses at 0.05 level of significance. Results showed that gender had no influence on the performance of pupils in basic science and technology and also showed that Mastery Learning Approach improved the performance of boys and girls in basic science and technology in the experimental group than those of the control group. The findings further revealed that MLA narrowed the gap between boys and girls with high, moderate and low performance level. This implies boys and girls performance improved equally in BSTPT. The results showed that teaching method has great influence on the performance of pupils than gender influence, since the performance of both boys and girls in the experimental and control groups did not show any remarkable differences.

Agboghoroma (2017) studied the effect of the effects of Mastery Learning Approach (MLA) on students' Achievement in Integrated Science. The study was Quasi-Experimental Nonrandomized Pretest-Posttest Control Group Design. The target demographic consists of Junior Secondary School Students (JSS) in Delta Central Senatorial District of Delta State, Nigeria. The available population was JSS III Students selected from the district co-educational schools in the Senatorial District. Purposive sampling approach was employed to gather a sample of four coeducational secondary schools. Each school contributed one JS III class for the study, therefore a total of 120 kids were engaged. The students were taught the same Integrated Science topic of Drug Abuse and Metabolism in the Human body. In the experimental group MLA teaching method was used while the conventional method was used in the control group. The experimental group was exposed to MLA for a period of four weeks. The researcher trained the teachers in the experimental group on the technique of MLA before the treatment. Pretest was administered before treatment and a posttest after four weeks of treatment. The instrument used

in the study was Integrated Science Achievement Test (ISAT) to measure students' achievement. The instrument was pilot tested to ascertain the reliability. The reliability co-efficient alpha was 0.74. Data was analyzed using ANCOVA statistics. Hypothesis was accepted or rejected at 0.05 significant level. The result of the study showed that MLA teaching method resulted in higher achievement. The researcher concluded that MLA is an effective teaching method, which Integrated Science teachers should be encouraged to use and should be implemented in all teachers' education programmes in Nigeria and other African nations.

Toheed et al. (2017) carried out a study on the effect of Mastery Learning Strategy (MLS) on learning retention of secondary school students in the subject of Mathematics by comparing it with Conventional Teaching Method (CTM). The study was carried in Mardan district of Khyber Pakhtoonkhwa, Pakistan. The purpose of the study was to identify an instructional strategy that might effect on learning retention of students. The design of the study was quasi-experimental. Sample was selected through purposive and convenient sampling. The sample size was 90. Experimental group (N=45) was exposed to MLS and control group (N=45) was taught through CTM. Data was collected through pre-test, post-tests and retention test. Data was analyzed through independent sample t-test. Significant difference was found in the learning retention of students in favor of experimental group. It was recommended that teacher may use MLS for teaching of mathematics at secondary school level.

However, the reviews of related empirical studies revealed that the sub-variables were investigated as independent study and not jointly undertaken. The reviews also revealed paucity of empirical studies in the study area. The previous studies also showed differences in study populations and samples and due to the fact that no study in the knowledge of the researcher was carried out using Economics in Akwa Ibom South Senatorial District. These were the existing gaps in the body of knowledge which the present study was poised to address empirically by investigating the effect of mastery learning instructional strategy on students' performance in Economics in secondary schools in Akwa Ibom South Senatorial District.

Statement of Problem

In spite of the importance of Economics to the students, the observation made by the researcher revealed that students' academic performance in both internal and external examinations have been very poor. This poor achievement of students in Economics could be attributed to the methods employed by the teachers in delivering lessons to the students.

On the spot interaction of the researcher with the students and teachers in public secondary schools in Akwa Ibom State revealed that the dominant method of teaching is the expository method. The one-way exchange of knowledge between teachers and students with the expository method often make students passive. It also makes lesson boring, less interesting and abstract and leads to poor academic performance. This therefore calls for the need for the adoption of interactive teaching strategies that engage students actively in the learning process.

It is the belief of the researcher that if interactive teaching strategies like the mastery learning is used by Economic teachers, it would give the students opportunity to engage actively in the lesson and this can lead to mastery of the learned tasks and hence improve their academic performance. This study therefore examined the effect of mastery learning instructional strategy on students' academic performance in Economics in Akwa Ibom South Senatorial District.

Purpose of the Study

The study was carried out to determine the effect of mastery learning on secondary school students' academic performance in Economics in Akwa Ibom South Senatorial District. Specifically, the study sought to determine:

i. the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method

ii. the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender

Research Questions

The following research questions were raised to direct the study:

i. What is the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method?

ii. What is the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender?

Research Hypotheses

The following null hypotheses were postulated to guide the study:

i. There is no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method

ii. There is no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender

Research methods

Design of the Study

The study adopted quasi-experimental research design using a non-randomised pre-test and post-test control group. This design was considered appropriate because intact classes without randomisation was used for both groups.

Population of the Study

The population of this study consisted of all the 26,598 Senior Secondary Two (SS2) students in the 72 public secondary schools in the Senatorial District.

Sample and Sampling Technique

The sample for the study consisted of 197 SS2 students which were selected from four intact classes in two public co-educational secondary schools in the study area. Purposive sampling technique was used for the selection. The criteria used for the selection of these schools were:

i. Schools that have teachers with qualifications in Economics Education.

ii. Government owned co-educational secondary schools.

iii. Schools that are currently presenting candidates for Senior Secondary School Certificate Examination(SSCE)

Instrumentation

The researcher developed instrument titled 'Economics Performance Test (EPT)' was used for data collection. The EPT had two sections- A and B. Section A consisted of personal information such as class, gender, location, while Section B had 25 multiple choice items with four options lettered A to D. The instrument was used for measuring the student's pre-test and post-test scores in Economics.

Validation of the Instrument

The instrument was validated using content and face validity. The content validity was established using test blue print as a guide for the development of the items. The face validity was achieved by giving the draft instrument; Economics Performance Test (EPT) with thirty (30) items to two lecturers in the Department of Economics and one lecturer from Test and Measurement, all from University of Uyo, and two selected secondary schools teachers for face validation. These experts checked the appropriateness of items and make useful suggestions that were incorporated into the final version of the instrument.

Reliability of the Instrument

Internal Consistency Method was used for establishing the reliability estimate for the Economics Performance Test (EPT). Using this method, the researcher administered the instrument to 30 students who were selected from the population of the study and were used only for the reliability. This means that they did not take part in the final study. The scores obtained from the respondents were analysed using Kuder-Richardson 20 formula. A reliability coefficient of 0.80 was obtained for the instrument.

Method of Data Collection

The researcher personally visited the selected schools with letter of introduction from the department to obtain permission from the school authorities so as to be allowed to use the schools for the study and to request the subject teachers of the selected classes to assist as research assistants. The researcher visited the selected schools in the study area on different dates to administer a pre-test and post-test to the students. A total of 197 copies of the instrument "Economics Performance Test (EPT)" was given out to the respondents and the same copies were retrieved. This was possible with the help of the research assistants.

Method of Data Analysis

Mean and standard deviation were used for answering research questions while ANCOVA was used for testing the hypotheses at .05 level of significance.

Results

The results of data analysis carried out on data collected for the study are presented in this section. The findings that emerged from the analyses were also presented as well as the discussion of findings. The presentations were done in line with the research questions and hypotheses directing the study.

Research Question One

What is the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method?

Table 1: Mean and standard deviation of the academic performance of students in Economics taught using mastery learning and those taught using expository method

Instructional strategy	N	Pre-test		Post-test		Mean Difference
		Mean	SD	Mean	SD	
Treatment	91	43.28	8.08	71.47	9.98	28.19
Control	106	43.28	9.07	56.25	11.37	12.97

The result in Table 1 reveals the pretest and posttest means of treatment group (those taught with mastery learning) of 43.28 and 71.47 and their respective standard deviations of 8.08 and 9.98 respectively. The result further shows the pretest and posttest means of control group (those taught with the expository strategy) of 43.28 and 56.25 and their respective standard deviations of 9.07 and 11.37 respectively with a mean difference of 15.22 between the treatment group and the control group. This difference in mean implies that there is difference in academic performance of students in Economics taught using mastery learning and those taught using expository method.

Research Question Two

What is the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender?

Table 2: Mean and standard deviation of the academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender

Instructional strategies	Gender	N	Pre-test		Post-test		Mean Difference
			Mean	SD	Mean	SD	
Treatment	Male	48	42.42	6.90	73.50	8.20	31.08
	Female	43	43.44	9.18	70.88	11.38	27.44

	Male	51	43.88	9.40	56.24	12.84	12.36
Control	Female	55	42.69	9.01	55.86	10.33	13.17

The result in Table 2 reveals the pretest and posttest means of male and female students performance in Economics in the treatment group of 42.42 and 73.50 and 43.44 and 70.88 respectively and their respective mean differences of 31.08 and 27.44. The Table also reveals the pretest and posttest means of male and female students performance in Economics in the control group of 43.88 and 56.24 and 42.69 and 55.86 respectively and their respective mean differences of 12.36 and 13.17. Comparing mean differences of male and female students in the treatment group and mean differences of male and female students in the control group implies minute difference exists in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender.

Hypothesis One

There is no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method

Table 3: Result of Ancova analysis of the academic performance of students in Economics taught using mastery learning and those taught using expository method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	12274.52[a]	2	6137.26	53.58	.00
Intercept	24614.67	1	24614.67	214.90	.00
Pretest	371.13	1	371.13	3.24	.07
Instructional_strategy	11910.68	1	11910.68	103.99	.00
Error	22221.28	194	114.54		
Total	822828.00	197			
Corrected Total	34495.80	196			

The result in Table 3 reveals that the calculated F-value of 103.99 is greater than the critical F-value of 3.89 at 1 and 195 degrees of freedom and at .05 level of significance. With this result, the null hypothesis was rejected. This implies there is significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method.

Hypothesis Two

There is no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender

Table 4: Result of Ancova analysis of the academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	13310.75[a]	4	3327.69	28.77	.00
Intercept	26171.35	1	26171.35	226.25	.00
Pretest	261.37	1	261.37	2.26	.13
Gender	103.13	1	103.13	.89	.35
Instructional_strategy	12815.59	1	12815.59	110.79	.00
Gender Instructional_strategy	77.46	1	77.46	.67	.41
Error	22209.94	192	115.68		
Total	831208.00	197			
Corrected Total	35520.69	196			

The result in Table 4 reveals that the calculated F-value of 0.67 is less than the critical F-value of 3.89 at 1 and 195degrees of freedom and at .05 level of significance. With this result, the null hypothesis was accepted. This implies there is no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender.

Discussion of Findings

The result of the analysis of the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method revealed that there is significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method. This finding lend credence to the work of Wambugu and Changeiywo (2008), who found that that Mastery learning teaching method resulted in higher achievement. The researchers concluded that mastery learning is an effective teaching method, which teachers should be encouraged to use and should be implemented in all teacher education programmes. The findings also lend credence to that of Agboghoroma (2017) whose study showed that Mastery Learning Approach resulted in higher achievements among students.

The result of the analysis of the difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender revealed that there is no significant difference in academic performance of students in Economics taught using mastery learning and those taught using expository method based on gender. This finding lend credence to the work of Wambugu and Changeiywo (2008), who found that Mastery learning teaching method resulted in higher achievements but gender had no significant influence on their achievement. The findings contradicted that of Mankilik and Dawal (2015), that the performance of both boys and girls in the experimental and control groups did not show any remarkable differences.

Conclusion

Based on the findings of the study, it was concluded that mastery learning do enhance secondary school students' academic performance in Economics in Akwa Ibom South Senatorial District.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Teachers should strive to use mastery learning strategy in teaching Economics concepts as this will help to concretize learning and hence facilitate academic achievement of students.

2. Teachers should create friendly, sociable environment and be tactful and patient in the task of facilitating students learning. This will motivate both male and female students to learn.

3. Seminars, workshops and conferences should be organized by the Ministry of Education, Management of institutions, Government and NGOs to popularize the participatory teaching strategies like the mastery learning approach.

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