

Meta-Analysis of Studies on Effects of Teaching Methods on Secondary School Students' Academic Achievements in Economics in Nigeria

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Abstract: *The study adopted survey research design using the ex-post facto procedure. The study examined all the previous research reports on studies on effects of teaching methods on students' achievement in Economics in Nigeria from 1980-2020 hence the exact population was not easy to be determined. A sample of 32 studies(cases)from 13 innovative teaching methods was examined using purposive sampling technique. The instrument for data collection was coding instrument which was developed by the researchers and validated by three experts; one from Economics education and two from measurement and evaluation, all from Michael Okpara University of Agriculture, Umudike Abia State. Inter-rater agreement was used to determine the reliability of the instrument which yielded a reliability coefficient of 0.81. Data was collected from previous research works from academic dissertations/thesis reports, published journals, unpublished articles, reports from Seminars and workshops that covered effects of innovative teaching methods on students' academic achievement in Economics. That was sought at libraries of Universities and colleges of Education as well as through internet publications. Three research assistants with the researchers visited public and institutional libraries as well as searched through internets for data collection. Effect size calculator was used to analyse data collected and to answer the research questions. The Cohen, Marion and Morrison (2007) effect size scale interpretation was used to interpret the effect sizes obtained. The results indicated that the use of innovative teaching methods in teaching Economics resulted to a large positive effect on students' academic achievement., while they have small mean effect size on male and female students' academic achievements in Economics. Based on the findings, it was recommended among others that Economics teachers should endeavour to use less of the conventional teaching method but more of innovative teaching methods to enhance students' achievements in Economics.*

Keywords: *Meta-analysis, teaching methods, Economics, Studies, Academic Achievement.*

INTRODUCTION

Economics is a social science that has recorded large number of students that offer it at the senior secondary school level of education in Nigeria. According to Awoke, Awoke and Odo (2011), almost 90% of the students that pass through secondary school level of education in Nigeria, choose the subject as their elective subject. The large enrolment of students into the subject according to Ede and Oleabhie (2016) is because it is regarded as the basic requirement for students' admission into courses in the managements and social sciences in higher institutions of learning.

Despite the noticeable increase in the number of students that offer the subject, there is a decline in the achievement of some students in the subject both in the internal and external assessments (Ede, 2015). In other words, the achievement of students in the subject at secondary school is not in the same proportion with the enrolment level. According to Ene (2019) only less than 70% of candidates that register Economics in external examinations in the recent years scored between A₁ and C₅. This was against Ede and Oleabhie (2016) who reported that the percentage of candidates that scored between A₁ and C₆ in May/June West African School Certificate examination between the years 2010 and 2012 ranged between 56-96%.

The decline in the achievement of students in Economics at secondary school level has been blamed to some many factors. Adu in Ede (2019) complained that Economics Curriculum appeared so over-loaded with contents and difficult for teachers and students to cover before the students are exposed to external examinations such as Senior School Certificate Examination (SSCE) and University Tertiary Matriculation Examination (UTME). Ede (2016) outlined other factors that necessitate poor achievement in Economics to include Mathematical Phobia, the use of unqualified teachers in teaching Economics, poor motivation of teachers, inadequate facilities and materials for teaching and learning, distractions from internets and social media. Chukwu and Oleabhie (2019) added that the persistent use of conventional method of teaching in Economics instructions bring about poor performances of students in the subject and therefore recommended the use of innovative teaching methods.

Innovative teaching methods are those improved method of teaching that guarantees more teacher and students interactions during teaching and learning. They are those methods of teaching that are more of students-centred and less of teacher-centred. They make students more involving and participatory in the teaching and learning exercises. Brandon in Bildfell (2015) defined innovative teaching as a constructivist, social-constructivist and students-centred process whereby students are active learners in supportive environment, engaging in authentic and relatable problem-solving activities to stimulate learning. Examples of innovative teaching methods used in teaching Economics include: Mastery learning strategy, project method, field trip, problem-solving, peer tutoring, concept-mapping among others.

Several studies have been carried out to determine the effectiveness of those innovative teaching method used by teachers in enhancing students' achievements, retention and interest in Economics. Studies have shown that innovative teaching methods have effects on students' academic achievements, retention and interest. For instance, Ede (2019), Oleabhie and Chukwu (2019) carried out studies on the effects of mastery learning strategies and Mind mapping strategy respectively on students' achievement in Economics at different time and locations and found them to be very effective in students' achievement in Economics. Similarly Ede and Uchenna (2018), as well as Onuoha, Amedu, Amos, Sadiq, Abdullahi and Anyaehie (2018) carried out different studies of effects of Reciprocal teaching methods and Reflection teaching methods respectively on students' achievement in Economics at different time and locations and discovered that they were very effective in attaining students achievements in Economics. Innovative teaching methods have been proven to be very effective in enhancing students' achievements, interests and retention in school subjects specifically in Economics.

Results from many studies have shown that gender has no significant effect on students' academic achievement in Economics when taught using innovative teaching. However there has been divergent views and results on which of the gender (male or female) records higher mean achievement than the other. For instance, while Ede and Uchenna (2018) discovered that male had higher mean achievement over female when taught Economics using Reciprocal teaching

method, Nwaubani, Ezeocha, Machebe and Nwaubani (2018) found in their study on effect of concept mapping instructional strategy on students' achievement in Economics that female students recorded higher mean achievement than the female students.

Although many studies have shown divergent results on the effect of innovative teaching methods on students' achievement in Economics when compared with the conventional teaching method, the size of the effect on Economics is yet to be determined. This however called for the need to determine the size of such effects on academic achievement of students (if isolated from other factors that could influence achievement) using appropriate statistical tool such as the meta-analysis.

Metal-analysis according to Cresswell (2005) is a type of research report which aims at integrating the findings of many (primary source) research studies by evaluating the results of individual studies and deriving an overall numeric index of the magnitude results. It is an analysis of analyses. Frasen and Walberg in Ede (2015) described meta-analysis as a statistical technique that bring together a large group of numerical results from a variety of studies. It is a type of research study in which the researcher compiles and integrate numerous previously published studies on a particular research question and re-analyses the results to find out the general trends of results across the studies. This study as a meta-analytical research, aimed at gathering and integrating results of previous individual studies on effects of various innovative teaching methods on secondary school students' achievement in Economics in Nigeria. Specifically, the study raised and answered the following research questions.

1. What is the mean effect size of the studies on effects of teaching methods on students' academic achievements in Economics?
2. What is the mean effect size of studies on effects of teaching methods on male and female students' academic achievement in Economics?

METHODS

The study adopted survey research design using the ex-post facto procedure. Survey in the sense that there were many studies already carried out in Nigeria on effects of teaching methods and students' academic achievement in Economics from which the outcome of the present study would be used to generalize for other findings on the study. It is ex-post factor because the results were already in existence which the researchers used without manipulating them. Nigeria is the area of the study. They examined all the previous research reports on studies on effects of teaching method on students' achievement in Economics in Nigeria from 1980 and 2020 hence the exact population was not easy to be determined. A sample of 32 studies (cases) from 13 innovative teaching methods was examined using purposive sampling technique. The choice of purposive sampling was because the attention was only on those studies on effect of innovative teaching methods on students' academic achievements in Economics. The instrument for data collection was coding instrument which was developed by the researcher and validated by three experts; one from Economics education and two from measurement and evaluation, all from Michael Okpara University of Agriculture, Umudike Abia State. Their criticisms and suggestions were adequately used to produce the final instrument for the study. Inter-rater agreement was used to determine the reliability of the instrument which yielded a reliability coefficient of 0.81 which indicated that the instrument was highly reliable for data collection. Data was collected from previous research works from academic dissertations/thesis reports, published journals, unpublished articles, reports from Seminars and workshops that covered effects of innovative teaching methods on students' academic achievement in Economics. That was sought at libraries

of Universities and colleges of Education as well as through internet publications. Three research assistants with the researchers visited libraries for data collection. Effect size formula was used to analyse the data collected and to answer the research questions while Winner combined test was used to test the hypotheses at 0.05 level of significance. The interpretation of the results (effect sizes) obtained from the analysis were interpreted based on the Cohen, Marion and Morrison (2007) effect size scale as thus: 0.00-0.20 =Small effect, 0.21-0.50=Moderate effect, 0.51-1.00 =Large effect.

RESULTS

The results were presented according to research questions and hypotheses.

Research Question One

What is the mean effect size of the studies on effects of teaching methods on students' academic achievement in Economics?

Table 1: Mean Effect size of Studies on Effect of teaching methods on Students' Achievement in Economics

S/No	Teaching methods	Total cases	Total effect size	Mean effect size	Interpretation
1.	Reflection method	1	0.73	0.73	Large
2.	Reciprocal	2	1.38	0.69	Large
3.	Mind mapping	2	1.44	0.72	Large
4.	Future wheel	2	1.32	0.67	Large
5.	Jigsaw	3	1.91	0.64	Large
6.	Think pair share	2	1.22	0.61	Large
7.	Peer tutoring	2	1.03	0.52	Moderate
8.	Mastering learning	3	1.89	0.63	Large
9.	Concept mapping	5	2.86	0.57	Moderate
10.	Field trip	3	1.81	0.60	Large
11.	Expository	2	0.97	0.49	Small
12.	Advance organizer	3	1.82	0.47	Large
13.	Concept attainment	2	0.94	0.47	Small
	Total	32	19.32	7.81	Large

$$\bar{x} \text{ effect size} = \frac{19.32}{32} = 0.60$$

Data in Table 1 indicated that the mean effect size for the 13 innovative teaching methods examined under 32 cases yielded a mean effect size of 0.60 which in Cohen *et al.* (2007) effect size interpretation represents a large effect size. This however, showed that the use of innovative teaching methods in teaching Economics resulted to a large positive effect on students' academic achievement.

Research Question Two

What is the mean effect size of studies on the effect of innovative teaching methods on male and female students' academic achievement in Economics?

Table 2: Mean effect size of studies on effect of teaching methods on male and female students' academic achievements in Economics

S/No	Teaching methods	Total cases	Total effect size	Mean effect size	Interpretation
1.	Reflection method	1	0.41	0.41	Small
2.	Reciprocal	2	1.00	0.40	Small
3.	Mind mapping	2	0.93	0.45	Small
4.	Future wheel	2	1.71	0.36	Small
5.	Jigsaw	2	0.75	0.38	Small
6.	Think pair share	1	0.43	0.43	Small
7.	Peer tutoring	2	0.96	0.48	Small
8.	Mastering learning	3	1.23	0.41	Small
9.	Concept mapping	4	1.35	0.34	Small
10.	Field trip	3	0.99	0.33	Small
11.	Expository	2	0.77	0.39	Small
12.	Advance organizer	2	0.83	0.42	Small
13.	Concept attainment	1	0.58	0.38	Small
	Total	27	11.94	5.18	

$$\bar{x} \text{ effect size} = \frac{11.94}{27} = 0.44$$

Data in table 2 revealed that the mean effect size for the 13 teaching methods examined under 27 cases on effects of teaching methods on male and female students' achievement in Economics yielded a mean effect size of 0.44. This according to Cohen *et al.* (2007) effect size interpretation represents a small effect size. This however implied that innovative teaching methods have small mean effect size on male and female students' academic achievements in Economics.

DISCUSSION OF FINDINGS

The results revealed that the use of innovative teaching methods in secondary school students' academic achievement produces large and positive effect size. This however, implied that apart from other factors that could enhance students' academic achievements in Economics, the use of innovative teaching methods contributes as large as 60% to their academic performance in Economics. The result collaborated with Brandon (2004) who stated that innovative teaching methods make learner active and participatory in the classroom which also encourage active learning. It also agreed with Nchikiri in Ede (2016) who opined that teachers who are conscious of attaining instructional effectiveness use less of traditional/conventional method of teaching but more of innovative teaching methods.

The results of the study further showed that the size of the effect of innovative teaching methods on male and female students' achievements in Economics was small and positive. This however showed that only 40% of their achievement was made based on their gender. This means that gender does not produce much effect on students' achievement in Economics when innovate teaching methods are used in teaching. The results agreed with Maduagwuna (2018) and Onuoha *et al.* (2018) who discovered in their different studies that gender has no significant influence on achievements of students in Economics when taught with Reflection and Future-wheel teaching methods respectively.

CONCLUSION

From the results of the study, it could be concluded that the use of innovative teaching methods in teaching Economics in secondary schools produced large and positive effects on students' academic achievements. In other words, in the midst of other factors that could influence and enhance students' academic achievements in Economics, the use of innovative teaching methods has large effects size on students' achievement. It could also be concluded that gender produces small effects on the achievements of students' in Economics using innovative teaching methods.

RECOMMENDATIONS

Based on the findings and conclusions, it could be recommended that:

1. Economics teachers should endeavour to use less of the conventional teaching method but more of innovative teaching methods to enhance students' achievements in Economics.
2. There should be regular seminars and workshops for Economics teachers on how to identify and use appropriate innovative teaching methods to enhance students' academic achievements in Economics.
3. Economics teachers should show less attentions on students' gender while teaching Economics at secondary school level.

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