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# A META-ANALYSIS OF STUDIES ON EFFECTS OF INSTRUCTIONAL METHODS ON STUDENTS' ACADEMIC ACHIEVEMENT IN ECONOMICS

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## ABSTRACT
The study aimed at reviewed the results of previous empirical studies on the effects of instructional methods on students' academic achievement in Economics in order to have a composite and conclusive point due to the inconsistencies of the early findings. Three research questions were raised to guide the study. Meta-analytic research design was used. The population of the study comprised all previous research reports on instructional methods and achievement in Economics in Nigeria between 2000–2018. Twenty studies that met the criteria were selected using judgmental sampling technique. Simple percentages and statistical transformations of effect size were used to answer the research questions and testing the hypotheses. The findings showed that results of the previous studies on the effects of instructional methods and students' achievement in Economics is significant, overall effects of instructional methods on students' achievement in Economics is significant, overall influence of gender on students' academic achievement is moderate and significant. Based on the findings of the study, it was recommended amongst others that concept mapping and learning cycle instructional methods be used in the teaching and learning of Economics in that they were shown to have the highest mean effect sizes on students' achievement.

Key word: Meta-analysis, Instructional methods, academic achievement, Economics

## Introduction
Teaching and learning of Economics are dynamic activities that are adapting to changing needs and problems of every society. In Nigeria, Economics is taught in senior secondary school using Economics Senior Secondary School Curriculum. Economics curriculum involves all the experiences and activities provided by the teacher and/or school to the students in course of handling Economics subject so as to achieve the stated objectives of the subject. According to Federal Ministry of Education (FME, 2009), the guiding principle of the Economics curriculum is the need to equip graduates of senior secondary school 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.

The objectives of Economics curriculum according to FME, (2009: p.96) include enabling students:

- understand basic Economic principles and concepts as well as the tools for sound economic analysis.
- contribute intelligently to discourse on economic reforms and development as they affect or would affect the generality of Nigerians.
- understand the structure and functioning of economic institutions.
- appreciate the role of public policies on national economy
- develop the skills and also appreciate the basis for rational economic decisions.
- become sensitized to participate actively in national economic advancement through entrepreneurship, capital markets and so on.
- understand the role and status of Nigeria and other African countries in international economic relationships.
- appreciate the problems encountered by developing countries in their efforts towards economic advancements.

The teaching and learning of Economics is basically designed to promote objectivity and independent thinking. Adu (2002) stated that the study of Economics serves a useful purpose in modern life. It gives facts and shows what maybe expected to be the outcome of certain lives of conduct. It helps us to decide which of several alternatives to choose. It changes its recipients to make wise choice that will satisfy their needs in the presence of unlimited wants with limited available resources. Economics as a subject has various values to the learners, it affords learners to the essentials of everyday life and it widens the mutual horizon of learners because it increases mental capacity to understand various problems of life and to analyse a situation and then draw conclusion which provides a guideline for successful life.

The importance of Economics education to any nation is to enable both leaders and citizens to understand basic economic concepts, principles as well as to understand, appreciate and seek to improve the economic situation for their own social good (Obemeata, 2001). The understanding of Economics is a pre-requisite for good citizenship and to be responsible citizens which involves the ability to take rational decisions on important economic issues with a good basis for doing so. The study of Economics prepares one to deal with issues in variety of fields, including business, law, politics, history and accounting (Ekweoba, 2014). The study of Economics prepares students for future that affects career prospects, investment decisions and retirement strategies. Economics is of great importance because it is a subject that has direct utility which prepares a student for a wide range of career

options, ranging from business to government such as industries and other professional areas like Banking, Accountancy, and Planning. 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.

In spite of the importance and relevance of Economics and the government's provision in terms of instructional materials and qualified teachers (Federal Ministry of Education FME 2009), students' achievement in Economics seems not to be encouraging. For instance, the West African Examinations Council Chief Examiner's Report (2010 to 2015) revealed that the achievement of students in Economics at the end of secondary education has remained poor. These poor achievements of students in Economics, a subject that promotes students' logical, critical and creative thinking is quite disheartening. However, some factors have been pointed out to be responsible for this poor achievement of students in Economics such as sub-standard and/or ineffective instructional/teaching methods, among others.

Instructional methods have been seen as one of the major factors that can enhance or dissuade students' learning potentials and achievement. Instructional methods have been put forward as one of the factors militating against students' academic achievement. For instance, Imoko, (2005) noted that the fall in standard of performance at secondary school level is incontrovertibly attributed to pedagogical approaches adopted by teachers in schools. According to Adu, (2002), the selection of appropriate teaching methods for a particular classroom situation enables the teacher and his/her students to accomplish specific goals. Students' achievement outcomes are of primary importance and are hypothesized to be mediated by changes in teachers' knowledge and application of pedagogical practices in teaching-learning process. Imoko (2005) observed that it is a common practice in Nigeria where a teacher stands before the chalk board and delivers lesson through verbal instruction while the students serve as passive listeners and take note from the board. Smith (2009) stated that this practice can be of great benefit in the students who are auditory learners because it was found that lectures appeal to their learning style. Also, in a lecture environment, instructors have a greater control over what is being taught in the classroom because they are the sole source of information (Imoko, 2005). However, lecture method seems to promote rote learning since students are simply passive listeners in the process. Some methods of conveying knowledge like lecture and recitation tend to be relatively ineffective on the student ability to master and retain important concepts, and on enhancing critical thinking and collaborative problem-solving among students (Ekweoba 2014). Little wonder the poor achievement of secondary schools students and the seeming failure of secondary education towards producing sound, creative, functional and effective secondary school graduates. Whether students have gained meaningfully or

not from the experiences, knowledge and skills provided through Economics curriculum can only be determined through academic achievement of students in the subject matter.

Students' academic achievement refers to a successful academic degree of attainment of individuals in tasks, courses or programmes to which the individuals were sufficiently exposed (Abiodun, 2004). According to Offorma (2016) achievement is the ability to attain the stated objectives of a programme of education. Obih (2015) also seen academic achievement as a fundamental criterion by which all teaching-learning activities are measured, using some stewards of excellence and the acquisition of particular grades in examination to measure students ability, mastery of the content and skills in applying the knowledge acquired to a particular situation. According to Ernest in Obih (2015), the measure for assessing students' level of academic achievement is through achievement test/examination and observations. Achievement tests may include tests or examinations given at the end of a lesson unit, term, session, year of programme such as weekly test, mid-term test, termly examination, first school leaving examination, senior secondary school examination (eg. WASSCE, NECO, NABTEB).

To ensure that students' academic achievement are on the increase and for them to be productive and functional to our modern day society and economy and as well meeting up with the global standard, there is every need for the application of students' participatory teaching methods. Some researchers have come up with improved instructional methods that are students' participatory oriented which includes concept mapping, meta-cognition, cooperative learning, problem-based learning, learning cycle strategy, the four Es (engage, explore, explain and evaluate), among others. These methods are regarded as the Constructivist methods.

Conflicting reports exist with regards to instructional strategies and students' achievement in Economics. Obih, (2014) studied the relative effects of problem-based and concept mapping instructional strategies on students' achievement in Economics. The study showed that there was no significant main effect of the treatment on students' achievement in Economics. Study by Ukwungwu (2001) showed that there are differences between the males and female when it comes to mathematical, spatial and verbal abilities. Azikiwe (2005) confirmed the above statement by observing that females show superiority especially in measures of verbal fluency (vocabulary, listening, speaking, comprehension, fluency and spelling) and that male show superiority in mathematical and spatial abilities. Contrary to this observation, however Bhutta, Cleves and Cassy (2002) observed that U.K and Scotland have enjoyed formal "gender parity" in education for number of years. Abba, (as cited in Eya, 2014) observed a significant set difference in academic performance/achievement among pre-NCE students of Economics in College of Education in Borno State. The female students had a higher means score than their male counterparts.

Rufai (2009) despite controlling other factors, the result showed that female students perform significantly worse in economics than male students. Aluko, (2005) also investigated the effects of students' gender and past performance on their performance during the first year Economic course of the Brumel University. Data about students were collected from male and female students from two faculties namely; faculty of Economics and that of Administration. Research results showed that female students were found to have better results than their male counterparts and that gender played an important role in influencing success in the University.

As there are many studies on instructional strategies and students' achievement in Economics are there diverse and conflicting research results. These diverse and conflicting results demand empirical studies to get an overall index of outcome and generalize their relationship. The conflicting results of studies of instructional strategies and students' achievement in Economics call for Meta-analysis. Elvik et-al, (2001) stated that, there is a need to conduct a systematic statistical review of the literature on the studies known as meta-analysis to summarize scholarly research. Glass (1976) proposed a Meta-Analytic approach as a method for combining the results of a series of studies in the same area. It is hoped that meta-analysis would aid reaching a strong conclusive and point.

Meta-analysis is the technique of statistically combining the results of different studies done on different samples that have each examined and presented findings on a similar relationship (Hunter & Smith, 2001).The objective of a meta-analytic study is to obtain the overall effect size (or mean) of the studies integrated. Adeleke (1998) defined effect size as a standardized measure of treatment effect that may be applied to a single study or average across several studies of similar type to provide a composite trend.

According to Bushman and Well (2002), meta-analysis refers to statistical methods of combining evidence, learning other aspects of 'research synthesis', or evidence synthesis, such as combining information from qualitative studies for more general context of systematic reviews. Meta-analysis is the study of a large body of studies using statistical procedures for the purpose of integrating, synthesizing and making sense of them (Glass, 1979). Meta-analysis is a procedure for statistically accumulating experimental and correlation results across independent studies that address a related set of research questions. In other words, meta-analysis could be said to be analysis of analyses.

Lanaham cited in Eya (2014) defines meta-analysis as an improved, more systematic and objective method of literature review capable of more attractive organization, analysis and synthesis of the vast bodies of accumulated data. The researcher observed that the traditional narrative review has been considered incapable of organizing, analyzing and synthesizing the vast bodies of data that have accumulated from research in psychology

and education. Elvik, Amundem and Hofset (2001) stated that a meta-analysis helps to summarise scholarly research. It refers to the statistical analysis of a number of analysed results from individual studies for the purpose of integrating the findings.

However, the purpose of this study is to statistically combine the results of several studies that were carried out on instructional methods on students' achievement in Economics to identify general direction in research outcome and determine the magnitude and mean effect size of each of the studies examined on instructional methods and students' academic achievement in Economics. Specifically, this study sought to determine the;

1. direction of the previous research studies on the effect of instructional methods on students' achievement in Economies.
2. magnitude of the effect size of each of the studies examined on instructional methods and students' academic achievement in Economics
3. mean effect size of each of the studies examined on the effect of instructional methods on students' achievement in Economics

**Research Questions**

The following research questions were posed to guide the study.

1. What is the direction of the previous studies on the effects of instructional methods on student's achievement in Economics?
2. What is the magnitude of the effect size of each of the studies examined on instructional methods and student's academic achievement in Economics?
3. What is the mean effect size for each of the studies examined on instructional methods and student's academic achievement in Economics?

**Methodology**

The research design adopted for this study is the survey because meta-analysis is a survey design. As noted by Elvik et al (2001) that, no survey would be considered valid if a sizable subset or stratum of the population was not represented in the cumulative results. Neither should a metal-analysis be considered valid if a subset of its population is omitted. The population of this study consisted of all reports of studies (Ph.D Theses, Master's Degree Theses, Journal Articles and other forms of publication) on effects of instructional methods on students' academic achievement in Economics in Nigeria from 2000 – 2018. However, from these studies, a total of Twenty (20) research findings on the effects of instructional methods on students' academic achievement in Economics were selected. The sampling procedure adopted in this study was judgmental, because studies in this area are few. The selections of variables to be coded in this study were based on extensive review of the coding instruments used by Adeleke (1988) and Owolabi, Sheu & Ogunjimi (2013). Statistical transformation by Adeleke (1988) was used to convert the various statistics reported by the researcher into effect size r and also to convert r to t statistics for studies

reported without t-value. Effect size which is one of the basic methods of quantitative research integration can be subjected to a test of significance using ($X^2$, *Z, t and f*). The interpretation of the calculated effect sizes using different formulae was based on Cohen's (1998) guidelines on interpretation of effect size to find out which is large, medium or small. According to Cohen, (1998), $r < 0.2$ represent small effect, $0.2 < or \leq 0.5$ represent medium effects while $0.5 < r \leq 0.8$ represent large effect. The method of data analysis in this study was got from the work of Glass (1981) as reported in Elvik et al (2001) used Glassian method of analysis. The technique analyses relationship between coded study characteristics and outcomes, and transform reported statistics in the required unit into quantitative research integration, using appropriate statistics as variance of its analysis. Such as simple Percentages and statistical transformations of effect size.

## Results

**Research question 1**: What is the direction of the previous studies on the effects of instructional methods on students' academic achievement?

**Table 1: Direction of the Previous Studies on the Effect of Teaching Methods on Students' Academic Achievement in Economics**

| Category of teaching method | Total No of Studies | Statistically significant studies at | | Statistically non significant studies | | No of studies based on year of study | | No of studies based on type of publication | | No of studies based on school level | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NO of studies | Perc.(%) | NO of studies | Perc.(%) | year | No of Studies | Type of publication | No of Studies | School level | No of Studies |
| **Concept mapping** | 4 | 1 | 5.26 | 3 | 15.78 | 2003-2010 | 6 | Published article | 15 | SS1 | 4 |
| **Meta-cognition** | 3 | 2 | 10.53 | 1 | 5.26 | | | Ph.D | 2 | SS2 | 11 |
| **Problem based** | 5 | 1 | 5.26 | 4 | 21.05 | | | M.Ed | 3 | SS3 | 5 |
| **Fours** | 2 | 2 | 10.53 | 0 | 0 | 2011-2018 | 14 | | | | |
| **Cooperative** | 2 | 1 | 5.26 | 1 | 5.26 | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Learning cycle** | 3 | 2 | 10.53 | 1 | 5.26 | | | |
| **Total** | **19** | **9** | **47.37** | **10** | **52.63** | **20** | **20** | **20** |

Result on Table 1 revealed that out of four studies examined on effect of concept mapping strategy, findings of three studies (15.78%) found no significant effect of concept mapping on students achievement, whereas only finding of one study (5.26%) found significant effect of concept mapping on students achievement in Economics. Also, findings of studies on meta-cognitive strategy showed that out of the three studies examined, two studies (10.53%) found significant effect of meta-cognitive strategy on students' achievement in Economics, and one study (5.26%) found no significant effect of meta-cognitive strategy on students' achievement in Economics. Similarly, out of the five studies examined under effect of problem solving strategy, four studies (21.05%) findings found no significant effect of the strategy to students' achievement in Economics, while one study (5.26%) found significant effect of problem solving strategy on students' achievement in Economics. Also, out of the two studies examined under four Es instructional models, the entire two studies (10.53%) showed significant effect of four Es on students' achievement in Economics. Studies examined under cooperative learning strategy, one study's finding (5.26%) was significant, and the other one (5.26%) was not significant. Again, out of five studies examined under learning cycle, three study findings were significant and the remaining two were found to have no significant effect of learning cycle on students' achievement in Economics. In summary, out of the 19 studies examined on method, 9 studies (47.37%) were reported to have significant effect on achievement, whereas, 10 studies (52.63%) were reported to have no significant effect on achievement in Economics.

Also, out of the 20 studies examined, 6 (30%) were carried out between 2003 to 2010, while 14 (70%) were carried out between 2011 to 2018. This showed that majority of the studies are still recent. Similarly, out of the 20 studies examined, 15 studies were published in journals, 3 were M.Ed unpublished project and 2 Ph.D unpublished Thesis. Finally, 4 of the studies were conducted using SS1 students, 11 used SSII students and 5 used SSIII students.

**Research question 2**: What is the magnitude of the effect size of each of the studies examined on instructional methods on students' Academic achievement in economics?

**Table 2: Magnitude of Effect size on Studies Examined on Instructional Methods on Students' Academic Achievement in Economics**

| **Statistical** | **Total No of** | **Quality of** | **Categories of Teaching Method** | **Total** | **Percentage** |
|---|---|---|---|---|---|

| **Method used** | **Studies** | **Effect Size** | **Concept mapping** | **Meta-cognition** | **Problem based** | **5Es** | **Cooperative** | **Learning cycle** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean and SD | 04 | Large | 1 | nil | Nil | Nil | nil | 1 | 2 | 10.53 |
| ANCOVA | 06 | Medium | 1 | Nil | 2 | 1 | Nil | nil | 4 | 21.05 |
| t-test | 10 | Small | 2 | 3 | 3 | 1 | 2 | 2 | 13 | 68.42 |
| **Total** | **20** | | **4** | **3** | **5** | **2** | **2** | **3** | **19** | **100.00** |

**NB: Effect size r< 0.2 –small; 0.2 < r ≤ 0.5- medium; 0.5 < r ≤ 0.8 – large effect size (Cohen, 1977).**

Results in Table 2 showed that out of the 20 studies examined, 4 were carried out using mean and Standard deviation, 6 were done using Analysis of covariance (ANCOVA), and 10 done using t-test. This showed that majority of the studies used t-test for their data analysis. Similarly, 13 of the studies (68.42%) examined reported, small effect size, 4 of the studies (21.05%) reported medium effect size, and only two of the studies (10.53) reported large effect size. This implies that majority of the study have small effect size.

**Research question 3**: What is the mean effect size for each of the studies examined on instructional methods and students' achievement in Economics?

**Table 3: Mean effect size of each of the studies examined on instructional methods and achievement.**

| **S/N** | **Method/Strategy** | **No of Studies** | **∑ (N-3)** | **∑ (Weighted Z)** | **Average Z = $\frac{\sum \text{weighted Z}}{\sum(N-3)}$** | **r value of Average z** | **Percentage ($100r^2$)** |
|---|---|---|---|---|---|---|---|
| 1 | Concept mapping | 4 | 1060 | 234.027 | 0.221 | 0.220 | 4.84 |
| 2 | Meta-cognition | 3 | 476 | 62.413 | 0.131 | 0.130 | 1.69 |
| 3 | Problem based | 5 | 458 | 41.659 | 0.091 | 0.090 | 0.81 |
| 4 | 5Es | 2 | 304 | 53.306 | 0.175 | 0.175 | 3.06 |
| 5 | Cooperative | 2 | 254 | 24.332 | 0.096 | 0.095 | 0.90 |
| 6 | Learning cycle | 3 | 590 | 142.215 | 0.241 | 0.240 | 5.76 |

Result in Table 3, shows that the mean effect sizes for concept mapping, meta-cognitive, problem based. 5Es, cooperative and learning cycle methods are: 0.220, 0.130, 0.09, 0.175, 0.095, and 0.240 respectively. This means that concept mapping, and learning cycle have medium effect on students' achievement, while meta-cognitive, problem based, 5Es and cooperative methods have small effect on students' achievement in Economics. The table

equally shows that concept mapping and learning cycle have high percentage variance (4.84 and 5.79) on achievement of students in Economics.

**Discussion**

Total of twenty (20) studies on the effect of instructional methods on achievement in Economics were examined in this study. The findings revealed that 9 studies have significant effect on achievement in Economics,10 studies have no significant effect on students 'achievement in Economics, while 1 study measured location and gender (which is a bit away from the researcher's interest and concern). This means that majority of the results showed that instructional methods have high significant effect on students' achievement in Economics.

These variations may be on the side of the teachers in terms of the manipulation of the instructional methods. That is to say, how the teacher uses a particular teaching methods (teaching style) determines the outcome on learners. This is in line with Smith (2009) who opined that teaching effectiveness is dependency upon the interaction between the instructors' subject – matter knowledge and teaching (pedagogical) ability. However, it was observed that concept mapping and learning cycle among other instructional methods have relatively higher effect size on students' achievement in economics. This is in line with Adu (2009) findings that teaching methods have high significant effects on students' achievement in Economics.

**Conclusion**

From the data presentation and analysis so far, the accumulated results of primary studies show that instructional method generally have a positive and statistically significant effect on students' achievement in Economics in Nigeria. In this order, learning cycle has the highest strength of relationship followed by concept mapping, and then the five 5Es method followed by problem based learning method.

**Recommendation**

In the light of the findings of this study, the following recommendations were made that;

1. Concerted effort should be made in the areas of encouraging the teachers to be more aware of the importance of using instructional methods in teaching and learning of economics for better academic performance and proficiency in Economics.
2. More qualified and experience teachers should be employed in teaching and learning of Economics.
3. Economic teacher should also make to know the importance of selecting instructional strategies that will have significant effect on students' achievement in economics.

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