



DIFFERENTIAL EFFECTIVENESS OF THREE METHODS OF TEACHING ECONOMICS ON STUDENTS' ACADEMIC PERFORMANCE: PROBING WITH ANOVA TEST

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ABSTRACT

The study investigated the differential effectiveness of three methods of teaching economics on students' academic performance. The purpose of this study was to investigate the differential effectiveness of teaching methods on students' academic performance. This study provides useful insights on the differential effectiveness diverse teaching methods have on students' academic performance. A sample of 116 undergraduate students from the Department of Economics was used for the study. The teacher prepared a lesson and students' assessment test scores from inferential statistics course. The differential effectiveness of the three teaching methods on students academic performance was analysed. General Linear Model based univariate ANOVA technique was used. The $F(2, 112)$ statistic ($= 12.72; p < 0.05$) revealed a significant differences on the effectiveness of the three teaching methods. The mean scores results demonstrate that deductive method was the most effective teaching method, followed by inductive method while the historical approach was the least effective teaching method. It was recommended that teachers need to have their own consideration when applying certain method, especially deductive or inductive method. This consideration will play a role as teaching strategies. The decision of choosing appropriate method will be a measurement to learning success. Teachers should be strategic and dynamic and observe all teaching and learning parameters as this would readily help in the choice of an appropriate and effective teaching method.

Keywords: Economics, Teaching Methods, ANOVA

Introduction

Teachers have numerous numbers of techniques or methods to choose from depending on the need and circumstances. Traditionally, teachers tend to dominate the learning process in the class instead of allowing the students or learners to dominate. Most teaching methods give more emphasis to learners than teachers. There are many teaching methods to be used and the choice of methods is with teachers for the success of their students in the classroom. Despite this, many teachers find it challenging to make the right decision regarding teaching methods, which affects learning massively (Boma, 2022). The concept of teaching method is vast; it comprises the process, whether pedagogical or andragogical. It is up to the teacher to choose the method that suits them, but whatever method one chooses, one must consider the student's needs, the class size or student number, and the curriculum.

Transferring knowledge requires teachers to use appropriate methods and pedagogy that best suit the learners' interests as well as the achievement of the lesson objectives (Daluba, 2022). This is because pupils' learning outcomes largely depend on the methodology used by teachers. Ewueme, Popoola, & Orim, (2023) maintains that for teaching and learning to be effective, teachers need to be conversant with numerous teaching strategies/methodologies that take recognition of the magnitude of complexity of the concepts to be covered. Moreover, researches on teaching and learning of economics constantly endeavor to examine the extent to which different teaching methods enhance academic achievement in students' learning. The poor performance situation is alleged to be as a result of the problems encountered by lecturers and students

in the teaching and learning of economics.

Statement of the Problem

Recent times, questions about the teaching methods on students' learning effectiveness have consistently raised considerable interest in the field of educational research. Teachers have the greatest potential to influence the students' education, while a student achievement is related to teachers' competence in using different methods of teaching. Thus, students achieve more when teachers employ systematic teaching procedures that make teaching and learning processes easier.

Excellent academic performance by the students is not only attainable but could also be sustained through teacher's method of teaching. However, the incidence of ineffective teaching technique of economics in senior secondary school has resulted to poor achievement in both internal and external examinations. Most teachers while teaching do not involve learner centered approach like questioning techniques, demonstration techniques and discussion techniques that facilitate effective teaching and learning. This study therefore examined the effectiveness of methods or techniques of teaching towards students learning.

Research Objective

The main objective of this study was to investigate whether there are significant differences between the effectiveness of different methods of teaching economics on students' academic performance.

Research Question

Are there any significant differences between the effectiveness of different teaching methods on students' academic performance?

Null Hypothesis

There are no significant differences between the effectiveness of different teaching methods of economics on students' academic performance.

Literature Review

Methods of Teaching Economics

Methods in economics teaching plays important role as it proposes a guide to how teachers deliver the materials to the students. Teaching methods are described as planning for systematic presentation based on certain approach selected. Teachers should be discernible and plan well to determine how to go about delivering lectures for to aid understanding and assimilation.

Today, economics requires the targeted application of active and interactive teaching methods, so that it is through a cognitive activity that students analyze and comprehend the different market processes. The methodology of teaching economics considers a system of closely related methods and forms of training. The question arises of how this technique differs from others. The answer lies on the surface. Education is closely related to the economic life of a person, state, society. Such knowledge is knowledge of economic terms, laws of economic development, as well as an understanding of the mechanisms for managing a market economy, economic principles, and laws. Since the critical forms in the organization of the pedagogical process in higher institutions are lectures and practical (usually seminar than laboratory) classes, they should pay more attention to the process of developing teaching methods for economics.

Deductive Method

The deductive approach is almost the same as the expository approach. Lecturer/teachers who use this approach start by mentioning the principles, or generalizations. He began by making statements relate some discoveries he had made or about information obtained previously. Then students are asked to use these statements on the problems they have (Sahabuddin. 2019). Deductive theory is providing information that starts from a

certain speculative thought or thought towards the data to be explained. Deduction Means reasoning or inference from the general to the particular or from the universal to the individual. The deductive method derives new conclusions from fundamental assumptions or from truth established by other methods. It involves the process of reasoning from certain laws or principles, which are assumed to be true, to the analysis of facts. Then inferences are drawn which are verified against observed facts. Bacon described deduction as a “descending process” in which we proceed from a general principle to its consequences. The method is categorized as a priori method, while others called it abstract and analytical. Deduction involves four steps: (1) Selecting the problem. (2) The formulation of assumptions on the basis of which the problem is to be explored. (3) The formulation of hypothesis through the process of logical reasoning whereby inferences are drawn. (4) Verifying the hypothesis.

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Inductive Method

Induction “is the process of reasoning from a part to the whole, from particulars to generals or from the individual to the universal.” Bacon described it as “an ascending process” in which facts are collected, arranged and then general conclusions are drawn. The inductive method was employed in economics by the German

Historical School which sought to develop economics wholly from historical research. The historical or inductive method expects the economist to be primarily an economic historian who should first collect material, draw generalisations, and verify the conclusions by applying them to subsequent events. For this, it uses statistical methods. The Engel's Law of Family Expenditure and the Malthusian Theory of Population have been derived from inductive reasoning (Smriti, 2019).

Various steps are gone through in developing economic theories through inductive method. The first step, as in the deductive approach, is to identify the problem. The second step is defining technical terms and variables related to the problem. It is the next step which is peculiar to the inductive method, namely, the collection of data about the variables related to the problem and doing some preliminary thinking about the possible functional relationships between the relevant variables. The next important step in the construction of economic theories in this method is the processing of data collected and finding out what relations between the variables actually hold good. From this, a theory is developed which can be further refined and tested through statistical methods. Once the theory has been developed one can make predictions on its basis, as is done in the deductive approach. If predictions of theory are in agreement with the facts and actual behaviour of the economy, then a new reliable theory has been developed. If a new theory explains "how things work" better than the existing ones, it replaces them. However, if predictions are in conflict with actual facts and behaviour of the economy, either the theory is discarded or fresh efforts are made to modify and refine it by collecting more data and processing them (Smriti, 2019).

Historical Approach

History is the study of the past in order to understand the meaning and dynamics of the relationship between cause and effect in the overall development of human societies. Its key feature is its broad range of inquiry, as it is as much concerned with wide perspectives, general explanations, and fundamental questions, as with specific detail or events, and the particular interpretation of sources and evidence. The claim of history is not so much its capacity to capture immense detail, or to record knowledge of the past, but to interpret, to handle a rich variety of sources in order to draw out their general relevance or to reveal their general significance for human understanding of why and how change occurs. Few historians would contest the view that history is not a science as a discipline of study, but is more a branch of the arts or humanities. It can be seen, at most, as a social science, and even then could not be defined as scientific in any exact or predictive sense (Bentley, 2020). Historical approach helps the students to apply the principles in the solution of economic problems because the method leans more towards traditional discussion, which is devoid of emotional judgment. This cycle starts with teachers investigating what students need to know and do to meet goals valued by the communities in which they live and are educated. Students' engagement, learning and well-being are the touchstone.

Methodology and Procedure

Introduction

This section describes the research design used in the study, population and sample, data collection, treatment of the experiment and statistical analytical techniques applied in the study.

Research Design

The study employed experimental design. Experimental design is the process of carrying out research in an objective and controlled fashion so that precision is maximized and specific conclusions can be drawn regarding a hypothesis statement. (Bell, 2018) It is a scientific method of conducting research in which one or more independent variables are altered and applied to one or more dependent variables in order to determine their influence on the latter. It is an attempt by the researcher to maintain control over all factors that may affect the result of an experiment. In doing this, the researcher attempts to determine or predict what may occur.

Population and Sample

The population for this study was undergraduate students from the Department of Economics. The sample consisted of one hundred and sixteen (n=116) students; from which 22.9% (n=25) were males and 77.1% (n=84) were females.

Data

The data for the study were generated from students' academic performance assessment test scores. The test was prepared by the lecturer from selected topics of inferential statistics; namely confidence interval estimation, hypothesis testing and chi-square distribution. The content validity of the test paper was ensured through moderation in line with the institutional academic quality assurance system.

Treatment

The sample was categorised into three groups; Group 1 comprised of 100 level (n=42) students, Group 2 comprised of 200 level (n=40) students and Group 3 encompassed 300 level (n=34) students. During the teaching and learning process, inductive method, deductive method and historical methods were applied on the groups; respectively.

Statistical Technique

The General Linear Model based univariate ANOVA technique was applied to examine the effectiveness of teaching methods on student academic performance; following the framework adopted by Cooper & Cohn (1997):

$$F(y_{ij}, x_{ij}) \leq C$$

(i)

where: F represents the function which transforms x into y; y denotes academic performance test score of the ith student in group j; x represents the ith teaching method applied to group j; and C denotes the positive scalar; which overall further reduces to:

$$TS_{ij} = \phi_j + \phi_i TM_{ij} + \epsilon_{ik};$$

(ii) where: TS represents academic performance test score of the ith student in group j; TM denotes the teaching method applied on the ith student in group j; and ϕ_i captures the effectiveness of the teaching method applied to a particular group.

The effectiveness of teaching methods was analysed using descriptive statistics and the ANOVA approach. Descriptive statistics were used to analyse the estimated means, standard deviation and standard error estimates; while the ANOVA test was applied to examine whether any significant differences exist between the students' performance mean scores of the three teaching methods.

Presentation of Results and Interpretation

Descriptive Statistics

This study seeks to determine whether there are any significant differences between the effectiveness of different teaching methods on students' academic performance

The dependent variable was students' performance assessment test scores obtained from the prepared internal test. Data were analyzed using descriptive statistics to examine the profile of the sample. From the sample of a hundred sixteen (n=116) students; 61.2 % were female and 38.8 % were

male. Learners' performance assessment test scores were recorded in the high, moderate and low band categories; and this follow the order 26.7% (n=31),

59.5% (n=69), and 13.8 % (n=16) were in the low, moderate and high classes; respectively.

Table 1: Descriptive Statistics

Performance Assessment Test Scores Based On Teaching Method	Mean	SD	Standard Error	95% confidence interval	
				LB	UB
Deductive Method (n=53)	1.94	0.456	0.068	1.662	1.890
Inductive Method(n=42)	1.76	0.424	0.062	1.054	1.632
Historical Method (n=21)	1.18	0.433	0.059	1.566	1.871

Source: Authors Computation

Following the application of the three methods of teaching economics (Deductive Method, Inductive Method and Historical Method), It is found that Deductive Method gave the high mean score of 1.94. while Inductive Method mean was 1.76, with the lowest mean of 1.18 from Historical method. It is evident, that the estimated mean of all the three teaching approaches fall within the 95% confidence interval. It is deducible that that combining both

Deductive and Inductive Methods of teaching economics remain the best that can yield impressive performance from learners.

Test of between effects

There are no significant differences between the effectiveness of different teaching methods of economics on students' academic performance.

Table: 2: Between effects result

Source	Sum of Squares	Df	Mean square	F-statistic	Sig.
Corrected Model	4.240	2	2.12	12.72	.000
Intercept	325.170	1	325.170	1.04000	.000
Teaching Methods	4.240	2	2.12	12.72	.000
Error	21.184	112	0.19		
Total	330.000	116			
Corrected Total	25.424	114			
R-squared = 0.168					

Source: Authors Computation

There is a significance difference in the performance assessment scores among three teaching methods of economics. ($F_{2, 112}$ F-statistic = 12.72) at 0.5 significance level). The Sum of Square (SS) and the corrected total of 25.42 clearly points at variability in the performance assessment test score variable. The R-Squared (0.168) equals the SS (Teaching Method)/SS (Corrected Total) = 4.240/25.424. This measures the proportion of variation in

the dependent variable that is predictable from the independent variables.

Conclusion and Recommendations

Based on the findings and the discussion of this research, it can be concluded that the teacher applied different methods of teaching economics; the students were taught through deductive, inductive method and historical method. The activities led by

the teacher witnessed the use of deductive, inductive and historical as represented by the implementation of the principles of the three methods. Deductive method was conducted by the teacher through general rule, example, and practice; meanwhile, the inductive method was from example, practice and general rule, while historical methods recapitulated events and practices that are antiquated. It is implied that when the teacher applies any of the methods, the teacher needs to consider students' level of interactions, intuitive power, and analytical strength before selecting the method.

Since deductive and inductive provide more advantages to classroom activities, teachers are always encouraged to apply these two methods. They can be applied in different background of classes. Teachers intensely promote students to active learning either deductively and inductively, therefore; they will learn best based on their learning characteristics. To teachers, it is recommended that teachers need to have their own consideration when applying certain method, especially deductive or inductive method. This consideration will play a role as teaching strategies. Their decision of choosing appropriate method will be a measurement to learning success. Teachers should be strategic and dynamic and observe all teaching and learning parameters as this would readily help in the choice of an appropriate and effective teaching method.

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