

IMPACT OF INTERACTIVE INSTRUCTIONAL TELEVISION ON ACADEMIC PERFORMANCE OF JUNIOR SECONDARY BASIC SCIENCE STUDENTS: EMPIRICAL EVIDENCE FROM ZARIA EDUCATION ZONE

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Abstract

The study is titled “Impact of Interactive Instructional Television on Academic Performance of Junior Secondary Basic Science Students: Empirical Evidence from Zaria Education Zone. The study was quasi-experimental in nature and specifically, the non-equivalent comparison group design was adopted. The study used 120 Upper-Basic III from GJSS, Aminu and GJSS Tudun-Jukun, Zaria as experimental and control groups respectively. The study answered two (2) questions and tested two (2) null hypotheses. Basic Science Achievement Test (BASAT) was the data collection instrument. The instrument was duly validated by experts and has the reliability coefficient index power of 0.780. The mean and standard deviation were equally used to answer the questions raised by the study. The independent sample t-test was used to test the study’s null hypotheses at 0.05 alpha. The study discovered significant difference between the academic performance of the experimental and the comparison groups. By implication JSS students taught with interactive instructional television out-performed their counterparts taught with lecture technique. The study found that gender has no effect on the performances of the experimental group signifying that the students that were taught with interactive instructional television responded well irrespective of their gender. In the light of the above, the study recommended as follows: Basic science teachers should be encouraged to use interactive instructional television in their classrooms for their students for optimum academic performance.

Keywords: Interactive, Instructional television, Academic performance, Basic science

Introduction

Education in every country needs to be a high priority situation, including new changes and ideals to its process. The disposition to acquire and apply technology to it is necessary to encourage teachers and students to have better contact, with this technology, to reinforce, practice and increases knowledge in different areas. The National Policy on Education enunciated (2004) in accepting education as instrument of change has set up among other things on education resource centre where emphasis is paid to audio-visual aids. We also have the audio-visual development centre of the Federal Ministry of Education, Kaduna. As a matter of fact, a teaching plan is incomplete without showing in comprehensive form; the audio-visual aid to be used. The students do not easily forget the experiments in the subject because most of their facilities of learning sight, touch, tastes, brain and so on are involved in their hard and softness.

A television set can be a window to worlds that students may never have the opportunity to visit. A television programme can spotlight a foreign culture, a moment in history, a science concept, a person’s life. Howard Gardner, Educational Psychologist, recognizes visual experience as the most common learning style; video is a natural educator. Like other educational resources, video should be used wisely and efficiently, maximizing its instructional impact. In the hands of a good

teacher, the VCR, monitor, and remote control empower student learning, unhampered by cognitive skill levels, age, gender, or even language proficiency.

The term “instructional television” refers to the use of the television medium in any of its various technical forms to present information, ideas and experiences in any subject area and at any level as some portion of organized educational programmed. The methods and practices of educational television are rapidly evolving in the wake of changing educational philosophies and newly developing communication alternatives. Instructional Television is an emerging instructional medium used in many parts of the world to improve students’ academic performance and to enable a teacher teach a large group of students within and outside the school environment. Instructional Television as described by James, Richard, and Fred (1969) constitute of simple television cameras used in classroom which serve as image magnifiers to aid demonstration, small portable video tape recorders which permit review and evaluation of student performance.

In their own view Vankatali, Pannersalvam and Sauthanam (2004) describe Instructional television as programmed related to an organized programmed of formal instruction and is directed to individual viewers who come under non formal educational programmed where suitable follow- up work by the teacher is essential to consolidate the gain of knowledge. Vankatali et al (2004) further stated that, instructional television programmed tend to bring into classroom experiences that local teachers cannot arrange. These include costly demonstration, complicated experiments and visual excursion to far off places and current events. Such programmed carefully produced an involving all kinds of inter related learning experiences which produce good result. They seek to overcome the obsolescence of the syllabus and present the latest advances in all fields.

The programmed fully exploits the following potentials of the medium.

- a. Immediacy for bringing to viewers the latest and existing new findings.
- b. Omnipresence for taking the viewers to the exact place like a research laboratory of a hospital and conference.
- c. Animation and special effects to help clarity concepts, invisible processes.
- d. Visual power for showing a variety of things.
- e. Intimacy with the things presented.

A study conducted by the ministry of education and culture in India (1981) recommended that television facilities should be used for educational development as well as notably for widening access to education, for reducing existing disparities between different regions of the country as well as different sections of the population and for bringing about an overall improvement in the quality of education. The study proved that television, through commonly devised programmed could contribute to the creation of national integration, bring about awareness of problems of national significance and develop desirable attitudes and values among children and youth and the population at large. Various studies have shown that media have a profound influence on the minds of children as well as adults; some of them tend to encourage positive habits as well as curiosity on the part of the historical studies revealed that there is no innovation investigated and discussed thoroughly as instructional television as it is the applications of television in formal course regardless of age or gender level and regardless of whether or not they are given for

credit. This includes school instructions in part of courses for direct teaching or for facilitating lecture-demonstrations.

Instructional television may be distributed by open or closed circuit systems or by both simultaneously. The primary goal of Instructional Television is to improve quality of education and classroom utilization. Instructional Television now stands as the most significant cross road in its history. A research study conducted by Wilbur Schramm (1962) revealed that there can no longer be any doubt that students learnt efficiently from instructional television. In spite of the audible objectives and benefit of Basic science in the school curriculum, the teaching of the subject is characterized with conventional method of teaching which always lead to ineffective learning and poor attitude of students toward the subject. Studies have shown the facilitative effects of instructional audio-visual media in learning, but most of these studies are in other school subject apart from Basic science. Based on the above, this study examined Impact of Interactive Instructional Television on Academic Performance of Junior Secondary Students in Zaria Education Zone, Kaduna State-Nigeria.

Objectives of the Study

The main objective of this study was to examine the Impact of Interactive Instructional Television on Academic Performance of Junior Secondary Basic science Students in Zaria Education Zone, Kaduna State-Nigeria.

Research Questions

This study was guided by the following question;

- i. What is the difference between the academic performance of JSS Basic science students taught by way of interactive instructional television and those taught through face-to-face lecture technique?
- ii. What is the difference between the academic performances of male and female JSS Basic science students taught by way of interactive instructional television?

Research Hypotheses

Based on the above the following null hypotheses were formulated and tested at 0.05 level of significance:

H₀₁: There is no significant difference between the mean academic performance scores of JSS Basic science students taught by way of interactive instructional television and those taught through face-to-face lecture technique;

H₀₂: There is no significant difference between the mean academic performance scores of male and female JSS Basic science students taught by way of interactive instructional television;

Methodology

This study utilized non-equivalent comparison group designs. As stated by May (2012) it is a design in which the effects of a treated or intervention are estimated by comparing outcomes of a treatment group and a comparison group but without the benefit of random assignment. This study utilized purposive sampling technique to choose the participating schools for the Quasi-experiment. Purposive sampling opines is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a

variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research. However, Olayiwola (2007) stated that 30 participants for each group (treatment and control) are considered adequate for this kind of study. It is based on Olayiwola's suggestions that this study utilized 120 JSS Basic science students; 60 students as experimental group and the other 60 as comparison group respectively. Therefore, GJSS, Aminu was utilized as experimental group while GJSS Tudun-Jukun, was used as comparison group.

This study utilized teacher-made test known as 'Basic Science Achievement Test (BASAT) as data collection instrument. The data for the study was the scores of the teacher made-test obtained from the pre-test and post-test administered on the control and experimental. The instrument was duly validated by experts and has the reliability coefficient index power of 0.780. The study's research questions were answered using mean and standard deviation. However the t-test independent sample was used to analyse the null hypotheses between the mean scores of the experimental and the control groups at 0.05 level of significance.

Results

Research Question One: What is the difference between the mean academic performance scores of JSS Basic science students taught by way of interactive instructional television and those taught through lecture technique?

Table 1: Descriptive statistics between the mean academic performance of JSS Basic Science students taught by way of interactive instructional television and those taught through lecture technique

Variables	Groups	N	Mean	Std Dev
Academic Performance	Experimental	60	29.2500	8.57000
	Control	60	18.0167	5.13378

The Table 1 above shows a descriptive statistics between the mean academic performances of Basic science students taught using lecture technique aided by television and those taught using lonely lecture technique. According to the outcome, their computed academic performances were 29.5000 and 18.0167 by those taught using lecture technique aided by television and those taught using lonely lecture technique respectively. The mean academic difference was 11.133 in favour of the experimental group. This indicate that Basic science students taught using lecture technique aided by television had significantly higher academic performance than their counterpart taught using lonely lecture technique

Research Question Two: What is the difference between the academic performances of male and female Basic science students taught by way of lecture technique aided by television?

Table 2: Descriptive statistics between the mean academic performance of male and female JSS Basic science students taught by way of interactive instructional television and those taught through lecture technique

Variable	Gender	N	Mean	Std.Dev
Academic Performance	Male	30	30.2667	8.25847
	Female	30	28.2333	8.89278

The Table 2 above is a descriptive statistics between the academic performance of male and female students taught using interactive instructional television. According to the outcome, their computed academic performances are 30.2667 and 28.2333 male and female students taught using interactive instructional television respectively. The mean academic difference was 2.0334.

Test of Hypotheses:

H₀₁: There is no significant difference between the mean academic performance scores of JSS Basic science students taught by way of interactive instructional television and those taught through lecture technique

Table 3: Independent t-test sample statistics difference between the academic performances of JSS Basic science students taught using interactive instructional television and those taught using lecture technique

Variable	T/group	N	Mean	Std.Dev	Df	t-cal	t-Crit	Sig (p)
Academic Performance	Experimental	60	29.2500	8.57000	118	8.710	1.96	0.000
	Control	60	18.0167	5.13378				

Calculated $p < 0.05$, calculated $t > 1.96$ at DF 118

Results of the Independent sample t-test statistics in table 3 revealed that significant difference exist between the academic performance of JSS Basic science students taught using interactive instructional television and those taught using lecture technique. This was because the calculated significance (p) value of 0.000 is lower than the 0.05 alpha level of significance while the calculated t value of 8.710 is higher is lower than the 1.96 critical t value at Df 118. Their computed academic performances are 29.5000 and 18.0167 by those taught using lecture technique aided by television and those taught using lonely lecture technique respectively. This indicate that students taught using interactive instructional television had significantly higher academic performance than their counterpart taught using lecture technique. Hence the null hypothesis was rejected.

H0₂: There is no significant difference between the academic performance of male and female JSS Basic science students taught by way of interactive instructional television

Table 4: Independent t-test sample statistics difference between the academic performances of male and female JSS Basic science students taught using interactive instructional television and those taught using lecture technique

Gender	N	Mean	Std.Dev	Df	T-cal	t-crit	Sig (p)
Male	30	30.2667	8.25847	58	.918	1.96	0.363
Female	30	28.2333	8.89278				

Calculated p > 0.05, calculated t < 1.96 at Df 58

Outcome in Table 4 shows the independent samples t-test statistics on difference between the academic performance of male and female JSS Basic science students taught using interactive instructional television. Reason being that the calculated significance (p) value of 0.363 is higher than the 0.05 alpha level of significance while the calculated t value of 0.918 is lower than the 1.96 critical t values at Df 58. Their computed academic performances are 30.2667 and 28.2333 by male and female JSSII Basic science students respectively. These indicate that gender does not significantly determine the academic performance of JSS students when exposed to this treatment. Hence the null hypothesis is retained.

Discussion of the Findings

The study revealed significant difference existed between the academic performance of JSS students taught using interactive instructional television and those taught using lecture technique. There is no significant difference between the academic performance of male and female JSS Basic science students taught using interactive instructional television. The result of the study revealed that there is a significant difference in academic achievement of students taught with Instructional television and those taught without it. This study support the finding of (Anulobi, 2009; Enemugha, 2008). They discovered that the use of instructional television in teaching science subjects enhance students' academic achievements. They affirmed that they are effective in teaching owing to their ability to captivate and hold attention as well as provide for direct interaction of students with what is learnt.

The study found that the use of Instructional television is effective and results in more learning in less time and better retention of what is learnt, especially when the material being learned was repeated to the learners. They provide experiences not easily obtained through other media and contribute to the efficiency, debt and variety of learning. The study also shows that the use of Instructional television is not gender dependent this is in agreement with studies of Okoro (2008) and Eshiette (2009) but negate the study of Enemugha (2008) who discovered male performed better than females when taught Biology with Instructional television.

Conclusion

Based on the above, it is concluded that interactive instructional significantly improves the academic performances of Basic science students in the study area. Also, gender does not affect

the academic performance of Basic science students taught by way of interactive instructional television.

Recommendations

In the light of the above, the following recommendations are made:

- i. Basic science teachers should be encouraged to use interactive instructional television in their classrooms for their students for optimum academic performance.
- ii. The Kaduna State government through the Ministry of Education should provide all the needed funds for the junior secondary schools to secure interactive instructional television for use by teachers of Basic science. This will greatly assist in promoting students' academic performances at JSS level.

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