

## Effects of Instructional Videos on Academic Achievements of Students in Educational Technology in Ebonyi State

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### ABSTRACT

*This study investigated the impact of instructional videos on the academic achievement of students enrolled in Educational Technology at Alex Ekwueme Federal University, Ndufu-Alike, Ebonyi State. A quasi-experimental research design was employed, incorporating pre-test and post-test measures with both experimental and control groups. The study participants comprised 80 male and female students drawn from two departments within the Faculty of Education, selected using a purposive sampling technique. A rating scale served as the instrument for data collection. Two research questions guided the study, alongside two hypotheses which were tested. Descriptive statistics, including mean and standard deviation, were used to analyze responses to the research questions, while inferential statistics—specifically ANCOVA and t-test—were employed to test the hypotheses at a 0.05 level of significance. The findings revealed that the use of instructional videos significantly improved students' academic performance in Educational Technology. Based on these results, the study recommended that State and Federal Ministries of Education should organize seminars, workshops, and conferences to train and sensitize teachers on the effective use and benefits of instructional videos in the teaching and learning process.*

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### INTRODUCTION

Education is the process of becoming critically aware of one's belief of his/her belief in a manner that leads to effective action upon it. Henderson (2008) proposed that education is a process of self-formation and self-determination, which is a system of ethical standards or morals dictating appropriate and inappropriate behaviours in line with expectations governing a particular culture, society, group, or individual. Education, therefore, remains the bedrock for national development. A nation's ability to be technologically advanced, economically self-sufficient, and politically active will depend on the level of education of its populace (Galle, Agahu & Riko 2020). It is in recognition of this that

education is adopted as an instrument par excellence for effective national development.

In the education policy document of Federal Republic of Nigeria (FRN, 2013, p.2), it was stipulated that "education should lead to the total integration of the individual into the immediate community, the Nigerian society, and the world". To achieve this recommendation, innovative technology is required in education for the benefit of every individual and the society as a whole. Any country's level of development is determined by its level of educational development. No country can say that its educational system has improved without integrating technology into its educational endeavours. Nigeria is currently going through substantial, complicated changes that have an

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impact on how human beings develop politically, socially, culturally, economically, and technologically. Education is a tactical tool for technical and economic change in a general and global framework. Education is an important factor in the development of human capital required to meet the present and future challenges of globalization (that is, knowledge and skill). That was why Dike (2014) opined that the focus of education system all over the world should be on developing the human capital needed to meet these challenges. However, emphasis is laid on education as it is the outcome or dependent variable of the present study.

A student is a person who is studying at tertiary institutions, secondary schools or other places of high school education (Oxford Dictionary). Students comprise the male and female gender. Gender is a term, borrowed from grammar to describe an individual's social identity (woman/girl, man/boy) and personality or behavioural tendencies (Joan & Sarah, 2016). There is considerable diversity in how individuals and groups understand, experience, and express gender through the roles they act on, the expectations placed on them, their relations with others, and the complex ways that gender is institutionalized in a society (Philip, 2005).

The level of understanding and retention of a student contributes to the academic achievement of that student. Therefore, Academic achievement is the extent to which a student, teacher or institution has attained their short or long-term educational goals (Nworgu, 2015). It refers to completing educational benchmarks such as a bachelor's degree etc. Students' academic achievements are described as their academic outcomes which indicates the extent to which a student has achieved their learning goals (Galle, et. al. 2020). It is often measured through examinations or continuous assessment. Effective teaching entails in-depth and comprehensive assimilation of ideas by the students.

In order for a student to attain his or her academic goals or achievement, there are certain teaching techniques and materials needed by the teacher in the teaching of the students, which include the use of instructional materials. Instructional materials serve as channels between the teacher and the students in giving out effective instructions. Oluwagbohunmi and Abdu-Raheem (2014)

posited that Instructional materials are those materials used by teachers to aid explanations and make the learning of subject matter understandable to students during teaching-learning process. Teachers need relevant materials for background information on the subject they are teaching. According to Joshua, et al.(2007), instructional materials are all things that are used to support, facilitate, influence, or encourage the acquisition of knowledge, competency, and skills. Isola (2010) defined instructional materials as things or tools that help teachers convey their lessons to students logically and systematically. Instructional materials or resources are very important in the educational institutions, especially in the large and crowded lecture halls to the improvement and attainment of educational goals in any given country. They cover everything that informs educators and students about how to teach and learn various subjects in schools in a way that is both effective and high-quality (Mordi, 2014). They include both visual and audio-visual aids which brings life to learning-by-arousing the interest of students-to-learn. One of such instructional materials is the use of instructional videos.

Instructional video is the production of video programmes directed toward helping students to achieve specific instructional objectives with a specific target population. This is referred to the transmission of educational programme which can be stored in video CD, DVDs and Flash drives. The videos can also be shared via the Internet. They are used to teach students repeatedly till they gain mastery of what is being taught. They could be employed in topics where the teacher finds it difficult to carry out practicals. The primary basic functions of teaching are to enhance and release such motivating forces and processes, such as interest and the necessary desire to learn. Instructional video could be used to achieve this aim (Ema, 2006). Instructional video does not only state a fact orally, it also shows that fact, illustrates it, and within a few moments puts it in a large context of knowledge related to the fact. These various kinds of elaboration via sound tracts and pictures increase the memory of the basic statement or information.

It has been found that the duplication of sensory channels and the richness of elaborated information are features that

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contribute to the ease of learning and also to the strength of retention of verbal information. Educational instruction video is used to achieve objective which are supposed to reflect in the attitude of the learners (Adeosun, 2002). Previous studies (Ofili, 2003 and Okworo, 2008) reported that television and videotape have an impact on students, encourage learning, and enhance the classroom with information that is unlikely to be present in a traditional classroom setting. According to these scholars, instructional videos make learning more permanent and offer rich learning experiences, Instructional video is a useful tool that helps to stimulate our perception, and increase our learning and retention simultaneously. It also allows repetitive viewing, the learner can repeat view until the concept taught is well understood (Hallinan, 2000). Instructional videos can positively impact Educational Technology students by enhancing learning motivation, practical skill acquisition, and knowledge retention, particularly when designed to be engaging and relevant to the subject matter.

In most cases, learners have difficulty understanding certain terms as a result of their cognitive operation and ability. Therefore, there is a need for teachers to employ materials and methods that will facilitate students' understanding thereby enhancing their achievements. Hence, the objective of this study therefore is to determine the effect of Instructional Videos on Academic Achievements of Students in Educational Technology in Alex Ekwueme Federal University Ndufu Alike, Ebonyi State.

## LITERATURE REVIEW

### Students and Instructional Videos

Students should be viewed as active learners and not as passive listeners, as emerging studies overtime prove that transformative pedagogies are necessary in the development of teaching approaches and this should be a primary challenge to university educators. Instructional media is one such way to create active learners by enhancing the students' learning experience. It includes all the materials, substantial resources and physical means an educator might use to implement instruction and facilitate students' achievement of instructional objectives. It facilitates learning or increased understanding of material and

enhances comprehension of the learners (Salama, 2009).

Instructional media may include traditional materials such as digital display boards, slides and videos or film. It also includes newer materials and methods such as computers, DVDs, CD-ROMs, interactive whiteboard, the Internet, and interactive video conferencing etc. This study focuses on the use of videos, with emphasis on instructional videos.

### Overview on Instructional Videos

One of videos' most obvious characteristics is its visual aspect as humans are built to rationally grasp the power of images to communicate easily. The ability of audio-visual method to attract learners' attention, increase motivation and transform learning experience in now widely recognized by educators, since the first use of filmstrips during World War II. The value and availability of audio visual materials in learning environments has thus developed in content and technology from then on (Cruse, 2007). According to a series of studies conducted by the Corporation for Public Broadcasting, it was discovered that the use of educational videos and television in classrooms has been on the rise over the past 20 to 30 years. The survey carried out included forms of usage, teachers' position and expectations for outcomes. Educational video is not only widely used in the classroom; it is also highly valued as a means of teaching more effectively and creatively.

Cruse (2007) observed that the direct relationship between the frequency of use of instructional videos and the sensed accomplishment and motivation by students is the most substantial survey that affirms the significance of multimedia tools. Furthermore, teachers who frequently use television or videos for two or more hours per week reported that two-thirds of their students learn better when video or television is used and about 70% of the teachers noted that the students' motivation increased.

According to a summary of current research and educator surveys, carried out by corporation for public Broadcasting in Cruse (2007), educational television and video:

1. Reinforces reading and lecture material.
2. Aids in the development of a common base of knowledge among students.
3. Enhances student comprehension and discussion.

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4. Provides greater accommodation of diverse learning styles.
5. Increases student motivation and enthusiasm.
6. Promotes teacher effectiveness.

The basis for creating technology enriched learning is the technological pedagogical content knowledge (Angeli, 2008). It defines the ways familiarity about tools, pedagogy, students and the framework are amalgamated. Information facilitated by instructors can be modified to educate more efficiently with technology in ways that indicate the added value of technology (Angeli, 2008). Research is increasingly challenging the pervasive belief that television and video viewing is a passive activity and viewers are only affected trivially with what they are watching and with time television and videos will hinder or have precedence over academic achievement (Cruse, 2007). But, Cruse (2007) supports the theory that viewing is instead an active process, one which can be 'an on-going and highly interconnected process of monitoring and comprehending' and 'a complex, cognitive activity that develops and matures with the child's development to promote learning'.

Visual learning is a great way of learning because it helps in increasing a learner's interest in a subject matter, makes the process of learning more enjoyable, and captures the student's interest for longer periods.

### Student

A student is a person admitted into a school or institution to study a specific subject at any given level of education who has the zeal of learning and acquiring self-development and knowledge in any profession of his or her choice. A student is anyone who engages himself or herself with several mental activities which enables the individual to reason and emit good behaviours, take up responsibility and make self-decisions. According to Oxford Advanced American dictionary, A student is a person who is studying at a school, college, or university, or who is formally engaged in learning. A student may also be someone who is very interested in a particular subject. Students are enrolled in courses or programs through which they acquire knowledge, skills, and competencies related to various subjects or disciplines. A student is

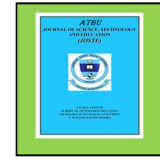
person who is studying at a school, college, or university (Cambridge Dictionary).

Students comprised of both male and female gender which possess certain characteristics in the way they react and act on different situations. They are on equal terms with people learning within educational institutions. However, it may be said they have achieved a certain level of knowledge— though mastery cannot be accurately claimed. Also, being a student implies a certain humility. In order to study and to learn, one has to be able to accept, absorb, and integrate new information into his/her brain.

### Gender

Gender refers to the characteristics of women, men, girls and boys that are socially constructed. This includes norms, behaviors and roles associated with being a woman, man, girl or relationship with each other (Geneva, 2010). Joan and Sarah (2016) posited that, gender is a term borrowed from grammar to describe individual's social identity (woman/girl, man/boy) and personality or behavioral tendencies. It refers to the roles, behaviors, activities and opportunities that any society considers appropriate for boys and girls, men and women. An understanding of gender requires understanding the complex social processes through which people are defined and linked. These processes operate at an interpersonal level, at an institutional level and across wider society, in government, the institutions of the state and whole world (Magar, 2015).

There are a variety of reports on the gender issue from a variety of scientific sectors. The impact of gender on students' learning outcomes across a variety of fields have been taken into consideration in numerous research. Researchers have thoroughly investigated the effects of gender on students' learning results. There are numerous reports on gender issues from various scientific sectors. For instance, Berteau (2009) opines that e-learning embraces the active participation of male and female students. Similarly, Lee, et. al. (2007) carried out a research whose result revealed no significant difference between male and female students in the aspects of examination scores, learning attitudes, and learning portfolios. According to Efuwape and Aremu (2013), there are no differences between men and women in terms of



the acceptance and usage of technology and scientific tools.

Studies have revealed a significant disparity in boys' favor. The findings of Ajitoni (2005) and Bolorunduro (2005) revealed that both male and female students had discernible sentiments in favour of women. Aremu and John (2005) found in their analysis that attempts are still being made to reduce the achievement gap between men and women. However, with the widespread of smartphones and personal computers, both male and female students are becoming conversant in learning with computer devices.

### Academic Achievement

Academic achievement represents performance outcomes that indicate the extent of which students, teachers or institutions have achieved their educational goals (Oriakhi & Igbudu, 2015). Richard, et.al. (2015) implied that academic achievement represents performance outcomes that indicate the extent to which a person has accomplished specific goals. A person who has accomplished specific goals must have undergone different measures and criteria which the outcome describes the stipulated goals. The academic achievement of Educational Technology students can be ascertained through their grades or performance in their assessment using the Educational Technology Students' Achievement Test.

The level to which students, teachers, or institutions have met their educational objectives is posited as academic achievement, which is the end result of education (Offordile, 2012). Academic achievement, according to Grobe and Bishop (2001), is what one does or achieves while attending school, college, or university, in a classroom, a laboratory, a library, or while engaging in field work.

Also in the words of Broussard (2002), academic achievement is the overall academic achievement of a student in the school, which is assessed by the use of teachers' ratings, tests and examinations. From all these assertions of academic achievements by various authors and organizations, the researchers see academic achievement the overall ranking of academic attainment of a student, which is measured by terminal, annual or end-of-course results of a student. The problem of poor academic achievement could be traced to multiple factors

of which may include the behaviour of students toward a subject and the teaching techniques of the teacher which can affect the students' performance.

### Integrating Instructional Video to Teaching

Teachers are responsible for imparting knowledge, skills, and values to great deal of student every day and ensuring that the learning is permanent (Roberson, 2012). In order to do this successfully, the use of instructional video in the classroom has become an important teaching strategy. Ellis (2001) identified three major benefits of using instructional videos in teaching and learning. First, instructional videos make content easier to understand and learn. Instructional videos also help students separate important information from what might be interesting but not essential information. Second, according to Ellis (2001), instructional videos decrease the necessary semantic information processing skills required to learn the material. By making the organization of content information easier to understand, instructional videos allow materials to be addressed at more sophisticated levels. Finally, students who use instructional videos may become more strategic, in-depth, and dynamic towards learning.

Studies suggest that when information is presented verbally and visually it has a better chance of being remembered. Corroborating research shows that concrete words are remembered better than abstract words, and that pictures alone are remembered better than words alone (Fleming & Levie, 1993). Information is more likely to be remembered by students when given in a visual format than when it is just conveyed orally. The visual dimensions added to the learning material concretize learners' experiences. This is vital because memory is frail and fickle, unless it rests on understanding. This assertion corroborates with the Chinese dictum: What I hear, I Forget, What I see, I remember, What I do, I understand (Adewoyin, 1991).

The educational significance of instructional video as enumerated by Mudasir and Aqueei (2012) is to: help in showing relationships by means of facts, figures, and statistics; understanding of abstract concepts and ideas in visual form; secure the attention of the pupils by their attractive format and simplicity of layout; gaining of concepts of size, distance,

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space, location and direction by means of maps; developing the power of analysis, synthesis and deriving conclusions from data; and the grasping of information easily.

One of the major problems facing tertiary education sector in Nigeria is the low level of the performance of students in both local and standardized examinations. It has become a great concern for researchers, educators and all education stake-holders over the years. It was observed that university students usually fail in examinations owing to improper teaching methods and lack of essential teaching aids for instructional delivery (Olayinka, 2016). Over the years, weaknesses manifested in the students' outcomes as reported by the various schools were poor grammatical expression, scanty explanation of points, and inadequate knowledge of drawing and analysis of graphs, simple calculation and lack of manipulative skills. These deficiencies could be attributed to students' overcrowding in class rooms which deprived smooth communication and interactions between teachers and students, and creates negative attitude towards some subjects, as well as ineffectiveness on the part of teacher due to the lack of instructional materials. This ineffectiveness could result in low teacher-student interaction due to routine conventional teaching technique that does not encourage students' participation during learning process (Galle, Agahu, & Riko, 2020).

### Research Objectives

Specifically, the study sought to:

1. Ascertain the differences in the academic achievement of students taught Educational Technology using instructional video and those taught without instructional videos.
2. Determine the differences in the academic achievement of male and female students taught Educational Technology using instructional videos.

### Research Questions

The following research questions were posed by the researchers to guide the study:

1. What are the differences in the academic achievements of students taught Educational Technology with instructional videos and those taught without instructional videos?

2. What are the differences in the academic achievements of male and female students taught Educational Technology using instructional videos?

### Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

- H01: There is no significant difference in the academic achievement of students taught Educational Technology using instructional videos and those taught without instructional videos.
- H02: There is no significant difference in the academic achievement of male and female students taught Educational Technology using instructional videos.

### METHODOLOGY

The researchers adopted a quasi-experimental design which involved pretest, treatment, and post-test of non-equivalent group design. The design was considered appropriate for this study because the researcher manipulated the independent variable, and purposively selected participants were used.

The population of the study consisted of 415 students who were offering Educational Technology in the faculty of Education, Alex Ekwueme Federal University Ndufu Alike, Ebonyi State, Nigeria. The sample of the study was made up of 80 male and female Students who were selected from two departments in the Faculty of Education, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State using purposive sampling technique. To determine the sample size for this study, cluster sampling technique was used. Cluster sampling is a method of probability sampling that is often used to study large population, particularly those that are widely geographically dispersed. In this cluster sampling, researchers divide a Population into smaller groups known as clusters, they then randomly select among these clusters to form a sample (Thomas, 2023).

The instrument for data collection in this study is a self-developed instrument known as the Educational Technology Achievement Test (ETAT). Questions were developed and used for collection of data, of which the questions were drawn from the Educational

Technology course outline which was administered to 200 level students in two departments of the Faculty of Education Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State (control group taught without instructional videos and experimental group taught with instructional videos). Forty - five questions with multiple choice objectives was drafted, having three options (a, b, c) was used.

## RESULT

In order to answer the research questions, the data for this study from the pretest, post-test, and retention test were compiled and analyzed using the descriptive statistic of mean (X) and standard deviation.

**Table 1:** The experimental and control group at pre-test and posttest Results of the Differences in the Academic Achievements of the Students.

Groups	N	Pre-test Mean	Post-test Mean	Mean gain	Pre-test SD	Post-test SD
Experimental	40	6.70	10.80	4.10	1.98	1.57
Control	40	8.07	8.55	0.48	1.19	1.20

In Table 1, pre-test mean is 6.70, experimental group and the standard deviation for pre-test is 1.98 for the experimental group while control group has the mean score of 8.07 and standard deviation of 1.19 meaning that mean score for control group is higher than mean score of experimental group at pre-test. However, after the administration of the instructional video,

the mean score of experimental group was 10.80 and the standard deviation was 1.57; while the mean score for control group after testing is 8.55 and standard deviation is 1.20, which means that the mean score of experimental group became higher, meaning that there is effect of instructional video in the academic achievement of Educational Technology students.

**Table 2:** Different Tests for the male and female students in control group.

Groups	N	Pre-test Mean	Post-test Mean	Mean gain	Pre-test SD	Post-test SD
Male	20	7.70	8.40	0.70	1.34	1.35
Female	20	8.45	8.70	0.25	0.87	1.03

Table 2 shows that the mean score for male in the post-test is 8.40 while standard deviation for male post-test is 1.35 and the mean gain is 0.70. Consequently, the post-test control group for female is 8.70 and standard deviation

is 1.03, mean gain 0.25. Going by the mean gain and standard deviation, we can see that the male students performed better than female students when taught with instructional videos.

## Hypotheses Testing

**Table 3:** Comparison of the mean scores of the experimental group and control group.

Groups	N	Mean	SD	SE	df	t-cal	P-Value
All Control Post-test	40	8.55	1.20	0.19	78	7.20	0.000
All Experimental Posttest	40	10.80	1.57	0.25			

Table 3 showed that the experimental group taught using video instruction had higher mean score ( $x = 10.80 + 1.57$ ), than the control group taught using the conventional method ( $x = 8.55 + 1.20$ ), which revealed statistically significant difference,  $+ (78) = 7.20$ ,  $p = 0.000$ .

**Hypothesis 2:** There are no significant differences in the academic achievement of male and female students taught Educational Technology with instructional video

**Table 4:** Comparison of the post-test mean achievement scores of male and female in the experimental group.

Groups	N	Mean	SD	SE	Df	t-cal	P-Value
Female Experimental Posttest	20	10.30	1.53	0.34	38	2.10	0.043
Male Experimental Posttest	20	11.30	1.49	0.33			

From the result of the analysis shown in Table 4, the mean achievement scores of males experimental group is 11.30 and that of the females mean achievement score is calculated t-value 2.10 at p-value of 0.043, that means we reject the null hypothesis and conclude that there is significant difference in mean achievement score between male and female students taught Educational Technology using instructional video. A critical look at the table reveals that the males mean achievement score is higher than the female which implies that instructional video has more effect on the mean achievement score of male students. This further shows that gender has effect on the use of instructional video in the learning process.

## DISCUSSION

The result of research question 1 revealed that the mean gain of the experimental group is 4.10 and the SD in the pre-test and post-test is 1.98 and 1.57 respectively. The control group had a mean gain of 0.48 with SD of 1.19 and 1.20. Hence, the difference between the mean achievement score of students taught Educational Technology with Instructional Videos and those taught without instructional videos is 3.62. The finding of this study revealed that the use of Instructional videos had a significant effect on students' achievement in Educational Technology. The students taught using Instructional Videos achieved significantly better than those taught without instructional videos. This is in line with the findings of Enemugha (2008); Okworo (2008); Anulobi (2009); Eshiet (2009) who discovered that the use of instructional video in teaching influences the students' academic achievement. They also affirmed that instructional videos are effective in teaching owing to their ability to capture and hold attention as well as provide direct interaction of students with the learning materials. The use of instructional video is effective and results to more learning in a short time and makes the students retain what is learned. Instructional videos also provide experience not easily obtained through

other media and also contribute to the efficiency and variety of learning. The position and impression of Newby et. al. (2006) about instructional materials like instructional videos is that they complement or play a supportive role in teaching in the bid to bring about adequate implementation of the curriculum. It is in these circumstances that the result of hypothesis one shows that there is a significant difference in the academic performance of the group taught using instructional video and the group taught without instructional video. This finding is in agreement with the findings of Osokoya, (2007), who investigated the effect of video instruction on secondary school students' achievement in History where he found instructional video to be effective in the learning of history. The finding further disagrees with the findings of Sani (2011) who found out that digital video for instruction had no significant effect on student achievement in chemistry.

The result of the research question 2 also revealed that the mean gain of the male experimental group is 0.70 and their SD in the pretest and posttest is 1.34 and 1.35 respectively. The female experimental group had a mean loss of 0.25 with SD of 0.87 and 1.03 in their pretest and posttest respectively. Hence, the difference between the mean retention score of male students taught Educational Technology with Instructional Videos and female students taught Educational Technology with Instructional Videos is 0.45. The finding of this study reveals that the use of instructional video has greater influence on the academic performance of male students than female students, because males pay more attention to watching films than males, which serves as an advantage to male students, that is why the mean achievement scores of males is more than that of the female students which concludes that there is gender effect on the use of instructional video. This is in line with the findings of Aremu and John (2005) who asserted that the use of technology in learning favors male students more than the female



students as males find technology more captivating, easy to manipulate and engaging.

However, Analysis of Covariance shows that there was a statistical significant difference in mean achievement of students taught Educational Technology using instructional Videos and those taught without instructional videos  $p = 0.000$ ,  $p < 0.05$ . The null hypothesis of hypothesis one which proposed no significant difference between the two groups was therefore rejected. Also the null hypothesis of hypothesis two was also rejected as the result shows that there was a statistical significant difference in mean achievement scores of male students taught Educational Technology using Instructional Videos and the female students taught Educational Technology using Instructional Videos =  $p$ -value of 0.043,  $p < 0.05$ .

## CONCLUSION

The study concluded that the use of video assisted instructional package was effective in enhancing the academic achievement of students in Educational Technology classes. However, male students have higher and better academic achievements than their female counterpart after exposure to

instructional videos. Therefore, Videos in education make it possible to overcome practical real-world constraints and explore the far greater possibilities provided by digital spaces. It promotes student-centered learning within the classroom and home. It can also be integrated in online learning systems (Learning Management System (LMS), portal, e-class, among others) and can be combined with other services.

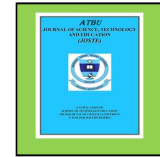
## RECOMMENDATIONS

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

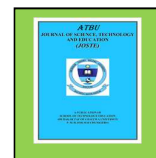
1. The use of Video-assisted instructional package should be used in presenting instructions to students' irrespective of their gender because it is gender friendly.
2. Teachers and students should be encouraged to use video assisted instructional package for teaching and learning to bring about effectiveness.
3. The Federal and State Ministry of Education are to regularly carry out seminars, workshops, refresher-courses and conferences for teachers on design, selection and utilization of instructional videos in teaching

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