

Impact of Video Clips Instructional Platform on Academic Achievement of Students in Maintenance of Electrical Equipment in Colleges of Education in North Central Nigeria

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Abstract

This study investigated the impact of video clips as an instructional platform to enhance the academic achievement and motivation of students in technical education. A pretest-posttest quasi-experimental research design was employed. Four research questions were formulated and tested at a 0.05 level of significance. The subjects were NCE III students from the 2023/2024 session, drawn from Colleges of Education in the North Central states of Nigeria. Out of a population of 2,900 NCE III students, 250 were sampled. Data collection instruments included the Technical Education Achievement Test (TEAT) to assess cognitive achievement and a structured questionnaire to determine levels of motivation, challenges, and strategies for effective use of the video clips instructional platform. The instruments were validated through face and content validation, and the Kuder-Richardson (KR-21) method was used to establish the stability of the achievement test, yielding a reliability coefficient of 0.88. The reliability of the questionnaire was confirmed using the Pearson product-moment correlation coefficient, which resulted in a value of 0.84. Findings from the study revealed that the use of video clips as an instructional medium significantly enhanced students' academic achievement and motivation to learn. The study recommends periodic training and orientation for both staff and students, as well as the installation of smart technology in lecture theaters to make ICT-driven teaching methodologies more accessible and effective.

Keywords: Video clips, Academic Achievement, Students' motivation, Colleges of Education, Nigeria, Technical Education

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I. Introduction/background of study

The teaching and learning process today has transcended the traditional confines of classrooms and school days. According to Adamu and Nathaniel (2019) the present advancement in Technology allows education to be accessed where, when, and how teachers and learners prefer, without the need to remain under the same roof or in the same physical environment. This paradigm shift has been attributed to the advent and transformation of Information and Communication Technology (ICT) which enabled the present day 21st-century teachers to interact with their students beyond the traditional classroom through e-learning platforms.

According to Ogbonna, Ibezim, and Obi (2019), one popular e-learning platform facilitating this change is Asynchronous Instruction. Dada, Alkali, and Oyewola (2019) define asynchronous instruction as an e-learning platform that provides learning materials whenever needed. It offers learners flexibility in terms of learning time, content, and process. Asynchronous learning environments have become popular because they are easier to establish and less costly than synchronous methods. Raymond, Atsumbe, Okwori, and Jebba (2016) emphasized that asynchronous instruction is becoming a favored platform for teachers to engage with students outside the conventional classroom setting. Adamu and Nathaniel (2017) further describe it as a student-centered teaching method that uses e-learning resources to facilitate information sharing, unrestricted by time or location.

One key characteristic of asynchronous instruction, according to Dada, Alkali, and Oyewola (2019), is that instruction does not happen in real-time. Teachers may deliver instruction via video or other digital means, and students respond later. For example, lessons may be delivered through the web or recorded videos, with

feedback provided via email. Smith (2009) lists examples of asynchronous instruction tools, including eLearning applications like hypertext documents, wikis, blogs, email, discussion boards, and social media platforms such as Facebook and WhatsApp. Other tools include DVDs, CD-ROMs, videotapes, Moodle, and YouTube.

A major consideration for any asynchronous technology is the convenience and personal schedule of the participants. Obasai, Eludire, and Ajao (2013) emphasized that learners' convenience and personal schedules are crucial for asynchronous tools. This teaching method allows learning to occur at different times and places, enabling students to learn at their own pace. Consequently, this innovative approach can motivate students by offering greater control over their learning.

Bhatia (2003) supports this assertion, noting that motivation enhances learning once interest is aroused. Scholars have increasingly focused on motivation as a factor influencing outcomes in educational settings (Kumazhege, 2016). As a result, there has been a call for innovative teaching methods that not only stimulate student interest but also ensure effective teaching and learning. Higley (2013) suggests that using familiar e-learning platforms like asynchronous instruction helps capture and maintain students' attention. Asynchronous instruction can make learning more engaging and enjoyable, as students have the opportunity to interact with and review lectures multiple times, ultimately improving their academic performance.

Academic achievement refers to students' performance as measured by exams within a course of study. Atsumbe (2013) notes that achievement is the outcome of education, which involves assessing the learner's mastery of tasks, courses, or programs to which they have been exposed. Gali (2003) similarly defines achievement as a measure of terminal or criterion-based behavior that determines students' performance against a specific standard. Academic achievement is important because it provides valuable feedback on how well students have met the expected learning objectives and can help teachers identify the relative standing of students.

Statement of the problem

The persistent issue of poor academic performance among technical education students in Nigeria's Colleges of Education has been a growing concern for stakeholders, as noted by Kumazhege (2016), Adamu, Atsumbe, and Raymond (2015), Langa (2013), and Chado (2010). Studies such as those by Udofia&Udofia (2013), Elbitar&Umunadi (2011), and Umunadi (2009) have identified a lack of innovative instructional delivery as a key factor contributing to this problem. Teachers have been slow to adopt new instructional methods that leverage the revolution in ICT. Innovative approaches, such as using video clips as instructional tools, can make teaching more flexible, realistic, and engaging. These innovations can improve academic achievement, stimulate student interest, enhance interaction quality, and motivate students to learn. As ICT continues to bridge global educational gaps, the use of innovative platforms such as video clips is spreading worldwide across educational institutions. There is a pressing need to assess the impact of these platforms on students, particularly in technical education programs.

Aim and objectives of the study

This study was designed to determine the impact of Video clips instructional platform as a tool for enhancing the academic achievement and motivation of students' in technical education.

Specifically, the study determines:

- i.) Students' academic achievement when taught with Video clips instructional platform
- ii.) The level of motivation of Students when taught with Video clips instructional platform
- iii.) Challenges associated with the use of Video clips instructional platform
- iv.) Strategies to promote effective use of Video clips instructional platform

Research questions:

The following research questions guide the study:

- i.) What is the impact of Video clips instructional platform on students' academic achievement?
- ii.) What is the level of motivation of Students when taught with Video clips instructional platform?
- iii.) What are the Challenges associated with the use of Video clips instructional platform
- iv.) What are the strategies that can promote effective use of Video clips instructional platform

II. Methodology

The study adopted the Pre-test, Post-test, Non-equivalent Control Group, Quasi-experimental Design. This approach was considered appropriate because intact classes were used for the study cannot be disorganized because of the research. Thus, this measure was necessary in order not to disrupt the normal schools' class structure and time-table. The use of intact classes in a quasi-experimental research was supported by Shadish, Cook and Campbell (2001) and Sambo (2008). A technical education achievement test was subsequently used to determine the achievement test while a well-structured questionnaire was used to determine the strategies for

promoting effective use of video clips instructional platform. The instruments for data collection was subjected to face and content validity while Kuder-Richardson (KR-21) was used to establish the stability of the achievement test and it yielded a result of 0.88. These values were considered good enough for the reliability of an instrument as affirmed by Uzoagulu (2011). On the other hand, the reliability of the instrument was established using the Pearson product moment correlation coefficient formula and was found to be 0.86.

The target population for this study consists of 2900 NCE III students of 2023/2024 academic session from the College of Education under study. Stratified random sampling technique was subsequently adopted to select the subjects for the study. Ary, Jacobs and Razavieh (2002) recommends the use of a stratified sampling technique in a research population that consists of a number of sub groups or strata that may differ in the characteristics being studied. On the other hand, Yaro Yamane’s sampling formula was used to sample 250 students for the research, 125 for the experimental and 125 for control group.

III. Result And Findings

Research Question 1: What is the impact of Video clips instructional platform on students’ academic achievement?

TABLE 1:
Pretest and Posttest Mean Scores of Experimental and Control Groups

Group	N	Pre-test	Post-test	Mean Gain
		\bar{X}	\bar{X}	
Experimental	125	62.70	75.55	12.85
Control	125	55.10	66.59	11.49

Table 1 shows that the experimental group had a mean score of 62.70 in the pretest and a mean score of 75.55 in the posttest making a pretest, posttest mean gain in experimental group to be 12.85. On other hand, the control group had a mean score of 55.10 in the pretest and a posttest mean of 66.59 with a pretest, posttest mean gain of 11.49. This result is an indication that the academic achievement of the experimental group is higher than the academic achievement of the students in the control group. Consequently, it could be affirmed that the use of video clips as a medium of instruction is more effective than the conventional teaching method.

Research Question 2

What is the level of motivation of Students when taught with Video clips instructional platform?

Table 2
Pretest and Posttest Mean Scores of Experimental and Control Groups

Group	N	Pretest	Posttest	Mean Gain
		\bar{X}	\bar{X}	
Experimental	125	44.45	48.95	4.50
Control	125	42.20	45.40	3.20

Data presented in Table 2 shows that the Experimental group had a mean score of 44.45 in the pretest and a mean score of 48.95 in the posttest hence making a pretest, posttest mean gain of the Experimental group to be 4.50. Meanwhile, the Control group had a mean score of 42.20 in the pretest and a posttest score of 45.40. Thus producing pretest posttest mean gain of 3.20. Consequently, this result is an indication that the students are slightly more motivated to learn when video clips were used as a medium of instruction.

Research Question 3: What are the Challenges associated with the use of Video clips instructional platform?

TABLE 3: Mean ratings of Challenges associated with the use of Video clips instructional platform

S/N	ITEM STATEMENT	Mean	Remark
The following are Challenges associated with the use of Video clips			
1	Inadequate training background on ICT usage among both the lecturers and students	4.55	SA
2	Nonchalant attitude of the College management towards the implementation of ICT policies	4.00	SA
3	Inherent resistance to changes among the students	4.35	SA
4	Lack of motivation by the College management	3.85	A
5	Insufficient provision of ICT facilities by the College management	3.76	A
6	Irregular and epileptic power supply by the electricity authority	3.45	A
7	Lack of skills and competence to operate the ICT devices by both the lecturers and students	4.25	SA
8	Poor internet connectivity and services within the college	3.78	A
9	Absence of power point projectors and interactive boards in the lecture theatres	4.55	A
10	Lack of interest on ICT usage by the students	4.00	A
11	Computer phobia among the students	3.50	SA

Data in Table 3 above revealed that all the statements had mean scores above the cutoff point of 3.00. This is an indication that the students concurred that all the items listed constitute barriers to the effective use of video clips as a medium of instruction.

Research Question 4: What are the strategies that can promote effective use of Video clips instructional platform among students

TABLE 4: Mean ratings of strategies to promote effective use of Video clips among students

S/N	Item Statement	Mean	Remark
	Strategies To Promote Effective Use Of Asynchronous instruction Among Students:		
1	Provision of steady and reliable power supply by the electricity authority	4.35	SA
2	Provision of high speed internet connectivity such as 5G within the lecture halls and Campus in general	4.85	SA
3	Enforcement of ICT polices by the school management	4.45	SA
4	Provision of well-equipped ICT centre by the college management	4.25	SA
5	Provision of power point projectors and other related technology based facilities in the lecture theatres	4.70	SA
6	periodic orientation to acquaint students with the use of innovative e-learning platform should be organized	4.20	SA
7	Close monitoring and supervision of lecturers' method of instructions by the College management	3.55	SA
8	Free access to software and virtual classrooms for students	3.40	A
9	Provision of alternative solar powered system for ICT facilities	3.75	SA
10	Students should be actively involved in activities that involved the use of eLearning in classroom	4.65	SA
11	Provision of subsidized I pads, Tablets, and laptops	4.25	SA
12	Provision of smart/ interactive boards in the lecture halls	3.80	SA

Table 4: Mean Ratings of Strategies to Promote the Use of Video clips among Students

Data in Table 4 indicates that all the statements had mean scores above the cutoff point of 3.00. This is an indication that the students agreed that all item statements are strategies that can be effectively utilized to encourage effective use of Video clips among students of electrical/ electronics in the institution under study.

IV. Discussion

This study was conducted to assess the impact of using video clips as a medium of instruction in the educational process. The findings indicated that video clips are significantly more effective in the teaching and learning process when compared to conventional teaching methods. Data analysis from research question one revealed that students taught using video clips demonstrated higher cognitive achievement than those instructed through the traditional face-to-face method. This finding aligns with the assertion of Ogbonna, Ibezim, and Obi (2019), who posited that asynchronous instructional platforms, such as video clips, allow students to re-watch lecture materials, download documents, and communicate with peers and teachers at their convenience. This flexibility fosters deeper understanding and improves academic achievement. Dada, Alkali, and Oyewola (2019) further corroborated this view, asserting that the use of video clips provides learners with greater flexibility in terms of content delivery, learning time, and process. The availability of learning materials on-demand enhances students' engagement and motivation, facilitating better learning outcomes.

Research question two, as explored through data presented in Table 2, revealed that students taught with video clips exhibited significantly higher levels of motivation compared to those in the conventional group. This result echoes the findings of Ogbonna, Ibezim, and Obi (2019), who explained that exposure to new information encourages students to connect it with existing knowledge or experiences, thereby creating a mental image that enhances learning. Innovative e-learning platforms such as video clips encourage active student participation, which is essential for improved academic performance. Literature consistently indicates that students perform better when they are actively engaged with the learning material, particularly through e-learning platforms that provide interactive and stimulating content.

Regarding research question three, which sought to identify the challenges associated with the use of video clips as an instructional platform, the data in Table 3 demonstrated that all item statements had mean scores above the cutoff point of 3.00. This indicates that students agreed on the various challenges, including poor internet connectivity, irregular power supply, lack of skills in operating ICT devices, and insufficient ICT infrastructure in colleges. Other significant barriers include resistance to change among both staff and students, and inadequate ICT training. These findings are in line with the study conducted by Kamar, Kubo, and Ibrahim (2016), who emphasized the challenges of integrating ICT in teaching despite its numerous benefits. The major barriers identified include unreliable power supply, weak internet connectivity, and a lack of ICT skills among both lecturers and students. The researchers contend that for countries like Nigeria to achieve technological advancement, stakeholders in education must work towards eliminating these barriers to facilitate the adoption of innovative teaching methodologies, including video clips and other ICT platforms.

In response to research question four, the findings highlighted several strategies to promote the use of video clips as an instructional tool. These include the provision of high-speed internet connectivity (such as 5G), reliable power supply, and well-equipped ICT centers by college management. Additional recommendations include offering free access to software and virtual classrooms, as well as the installation of alternative solar-powered systems for ICT facilities. These strategies align with the suggestions of Adamu (2017) and Adamu and Nathaniel (2019), who emphasized the importance of steady power supply, well-equipped ICT infrastructure, and subsidized devices (e.g., tablets and laptops) for students and teachers. Furthermore, respondents suggested organizing periodic orientation and capacity-building programs to train students on the concept of e-learning, alongside regular workshops for both staff and students to stay updated on the latest technologies in e-learning. Kamar, Kubo, and Ibrahim (2016) also advocated for regular capacity-building initiatives, including sponsorships for staff and students to attend national and international workshops, seminars, and conferences, as effective measures to promote the use of innovative ICT-based instructional methods in tertiary institutions.

V. Conclusion:

The use of innovative teaching and learning platforms especially those that involves the use of ICT such as video clips has become inevitable in higher institutions because of the numerous benefits and potentials which includes the ability to perform better as well as stimulate the interest of students to learn. Sadly enough, it has been discovered that the inability of both the students and teachers to adopt these innovative eLearning teaching platforms has been acknowledged as one of the major factors responsible for the persistent failure of students in most colleges of education in Nigeria. It was against this backdrop that this study was conducted to determine the impact of video clips as a medium of instruction on academic achievement and motivation of students' of technical education. The study found out that the use of video clips was more effective than the conventional method of instruction in enhancing the students' cognitive achievements. The study also revealed that the students were highly motivated as a result of exposure to a relatively new approach to learning. This finding was consistent with other previous studies on the use of innovative eLearning platforms such as the ones that involves the use of video clips instructional platform.

VI. Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance the effectiveness of ICT-based learning platforms, particularly the use of video clips as an instructional tool:

1. Periodic Training and Orientation: The college management should organize regular training and retraining programs for staff, alongside orientation sessions for students, to improve their competence in using innovative e-learning platforms.
2. Improved Internet Connectivity: The provision of high-speed internet connectivity is essential within the college premises to facilitate the seamless use of video clips and other e-learning platforms.
3. Well-Equipped ICT Centers: The school authority should establish fully equipped ICT centers, providing students and staff with access to the necessary tools for effective e-learning.
4. Subsidized Devices: The provision of subsidized devices, such as tablets, laptops, and iPads, for both students and staff will ensure broader access to digital learning resources.
5. Reliable Power Supply: A consistent and reliable power supply should be ensured by the electricity authority to prevent disruptions during e-learning sessions.
6. Alternative Power Solutions: The installation of solar-powered systems for ICT facilities will provide an alternative power source, mitigating issues caused by power outages.
7. Smart Technology in Lecture Theaters: The installation of PowerPoint projectors and smart/interactive boards in lecture theaters will enhance teaching effectiveness and facilitate more interactive learning experiences.

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