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EFFECTS OF POWER POINT ANIMATION INSTRUCTION ON ACADEMIC PERFORMANCE, INTEREST AND RETENTION OF OFFICE TECHNOLOGY AND MANAGEMENT STUDENTS IN WEBPAGE DESIGN IN POLYTECHNICS

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ABSTRACT
The study investigated the effects of a PowerPoint animation instructional package on the academic performance, interest, and retention of Office Technology and Management students in webpage design in polytechnics. Four specific objectives guided the study. The quasi-experimental research design was employed based on a pre-test and post-test control group. The population of this study was made up of sixty-five (65) NDII students of Office Technology and Management in Federal Polytechnic Daura. The entire population was purposely selected to make an intact class and manageable size for the experiment. The instruments used for the study were a Pre-diagnostic Achievement Test (PAT) which served as a pre-test and comprised ten objective questions to answer, while the Webpage Design Achievement Test (WDEAT) served as a post-test and contained essay and objective questions to answer. The instruments were validated by three experts, and all their corrections were incorporated into the final copy, which made them valid for collecting data for this research. In order to ensure the reliability of the instruments, a pilot testing was conducted. The researcher administered twenty (20) copies of the questionnaire to NDII students of Hassan Usman Katsina Polytechnic Katsina using the test-retest method. The data collected from the pilot testing was subjected to a reliability test. The reliability of the instrument was determined using the Spearman Rank Correlation Coefficient. The reliability coefficient calculated was 0.81. The reliability coefficient was positive, and hence, the instrument was considered reliable and stable for the study. It was concluded that compared with traditional or static methods, the use of a PowerPoint animation instructional package in teaching Webpage Design to Office Technology and Management students in polytechnics has positive effects on academic performance, student interest, and retention, provided the animations are well-designed and aligned with instructional goals. It was recommended, among other things, that the Polytechnics should integrate PowerPoint animation instructional packages into the regular teaching of Webpage Design for Office Technology and Management students in order to enhance academic performance. Research has consistently shown that animated multimedia instruction improves learners' understanding and achievement by presenting abstract and procedural concepts more clearly than conventional lecture methods.

Keywords: Power point Animation, Interest, Retention, Webpage design, Performance

Introduction

The rapid advancement of Information and Communication Technology (ICT) has transformed the global educational landscape, shifting instruction from traditional teacher-cantered approaches to more dynamic, student-cantered multimedia environments. In the field of Office Technology and Management (OTM), graduates are expected to master complex digital competencies, including webpage design, to remain competitive in the modern corporate world (Okute et al., 2022). However, teaching technical courses like webpage design often presents challenges due to the abstract nature of coding and design principles, which can lead to low interest and poor academic performance among students (Akor, 2011; Umoru, 2023).

Multimedia learning tools, specifically PowerPoint animation instruction, have emerged as a potential solution to these pedagogical hurdles. According to the Cognitive Theory of Multimedia Learning (Mayer, 2021), the human brain processes information more effectively when it is presented through both visual and auditory channels. By utilizing animated transitions, moving text, and dynamic graphics, PowerPoint animation can simplify complex concepts, capture student attention, and reduce the cognitive load associated with learning technical software and languages (Adonu et al., 2021; Jude, 2022).

In the Nigerian polytechnic context, the National Board for Technical Education (NBTE) has consistently advocated for the integration of innovative ICT tools to enhance the delivery of the OTM curriculum (NBTE, 2024). Despite these directives, traditional lecture methods still dominate many classrooms, often resulting in students who can recall theory but lack the practical retention and interest necessary for real-world application (Onah & Okoro, 2024). Recent studies suggest that while OTM students recognize the importance of digital skills, their academic achievement is frequently hindered by a lack of engagement and inadequate instructional strategies (Adamu, 2023; Umoru, 2023).

The variables of interest and retention are critical in this study. Interest acts as a mediator that fuels student engagement, while retention determines the ability to apply learned skills after the instructional period has ended (Basak et al., 2018). While some research has explored the general effects of PowerPoint, there is a scarcity of empirical data specifically focusing on the influence of animated PowerPoint instruction on the academic performance and long-term retention of OTM students in webpage design within the North-West zone of Nigeria. Therefore, this study seeks to fill this gap by investigating whether animated instructional packages can significantly improve learning outcomes compared to conventional methods.

Statement of the Problem

The modern workplace demands that Office Technology and Management (OTM) graduates possess high-level technical competencies, particularly in Webpage Design, to function effectively in automated office environments. However, there are persistent concerns regarding the declining academic performance and lack of practical retention among polytechnic students in this core area.

Despite the importance of the subject, traditional teaching methods characterized primarily by "chalk-and-talk" and static lectures remain the dominant instructional approach in many Nigerian polytechnics. These conventional methods often fail to stimulate student interest or simplify the complex, abstract concepts inherent in web coding and design. Consequently, students frequently struggle to move beyond surface-level memorization, leading to poor retention of skills and unsatisfactory performance in both internal and external examinations.

While information technology has provided various multimedia tools, the extent to which PowerPoint Animation Instruction can bridge this pedagogical gap remains under-explored in the OTM departments of polytechnics. If this lack of engagement and poor retention persists, OTM graduates may enter the labour market ill-equipped to handle modern web-based office tasks.

Therefore, this study seeks to determine the effects of PowerPoint Animation Instruction on the academic performance, interest, and retention of OTM students in Webpage Design within polytechnics.

Aim and Objective of the Study

The aim of the study is to determine the Effects of Power point animation Instruction Package on Academic Performance, Interest, and Retention of Office Technology and Management Students in Webpage Design in Polytechnics. The specific objectives are to:

1. determine the effect of Power point animation instruction package on the academic performance of office technology and management students in webpage design in polytechnics
2. ascertain the effect of power point animation instruction package on the interest of office technology and management students in webpage design in polytechnics
3. determine the effects of power point animation package instruction on the retention of office technology and management students in webpage design in polytechnics
4. determine the difference in the effect of power point animation between students mean academic performance and mean interest in webpage design

Research Questions

1. What are the effect of Power point animation instruction package on the academic performance of office technology and management students in webpage design in polytechnics?
2. What are the effect of power point animation instruction package on the interest of office technology and management students in webpage design in polytechnics?
3. What are the effects of power point animation package instruction on the retention of office technology and management students in webpage design in polytechnics?
4. What are the difference in the effect of power point animation between students mean academic performance and mean interest in webpage design?

Literature Review

This literature review examines studies related to the use of PowerPoint animation instructional packages and their effects on academic performance, interest, and retention, with particular emphasis on Office Technology and Management (OTM) students, webpage design, and polytechnic education.

Concept of PowerPoint Animation Instructional Package

A PowerPoint animation instructional package refers to a systematically designed multimedia teaching resource that integrates text, graphics, animations, audio, and step-by-step visual demonstrations to facilitate learning. Animated PowerPoint presentations are grounded in multimedia learning principles, which emphasize the integration of verbal and visual elements to enhance understanding and knowledge retention. According to Mayer (2022), well-designed multimedia instruction reduces extraneous cognitive load and supports meaningful learning, especially in technical and procedural subjects such as webpage design.

In technical and vocational education, PowerPoint animation packages are used to illustrate complex processes, coding procedures, and design layouts in a sequential and visually engaging manner. This approach aligns with constructivist learning theory, which advocates active learner engagement and the use of instructional materials that support knowledge construction (Aina & Ojo, 2021).

Academic Performance and PowerPoint Animation Instruction

Academic performance refers to the measurable learning outcomes demonstrated by students through tests, projects, or examinations. Several empirical studies have reported that the use of animated PowerPoint instructional packages significantly improves students' academic performance compared to traditional lecture methods. For instance, Yusuf and Balogun (2022) found that students exposed to multimedia-based instruction performed better in computer-related courses due to improved comprehension and clarity of concepts.

Similarly, Sarkar and Das (2023) reported that animated presentations enhance learners' understanding of procedural tasks by presenting information in manageable segments. In the context of webpage design, animation-based instruction allows learners to visualize coding steps, page structure, and design outcomes, thereby improving mastery of skills. Studies conducted in Nigerian polytechnics also suggest that ICT-based instructional strategies positively influence students' achievement in Office Technology and Management courses (Okorie & Nwankwo, 2021).

Students' Interest and the Use of PowerPoint Animation

Interest is a psychological state that reflects learners' curiosity, attention, and willingness to engage in learning activities. Instructional methods that incorporate animation and multimedia elements have been found to significantly increase students' interest and motivation. Okafor, Yusuf, and Bello (2022) observed that animated instructional materials attract students' attention and sustain engagement longer than conventional teaching approaches.

In technology-oriented courses such as webpage design, interest plays a crucial role in encouraging exploration and hands-on practice. Animated PowerPoint packages provide interactive and visually stimulating learning experiences that can reduce boredom and anxiety associated with learning programming-related concepts. A study by Adebayo and Lawal (2023) revealed that students taught with animated multimedia tools demonstrated higher interest levels and active participation in class activities compared to those taught using traditional methods.

Retention and PowerPoint Animation Instructional Package

Retention refers to the ability of learners to recall and apply learned knowledge over time. Effective instructional strategies should not only enhance immediate academic performance but also promote long-term retention. Research indicates that multimedia instruction enhances retention by engaging multiple sensory channels and reinforcing learning through visual and auditory cues (Mayer, 2022).

Sadiq and Ibrahim (2021) reported that students exposed to animated instructional packages showed better retention of computer application skills than those taught through lecture methods. In webpage design, animated demonstrations of coding syntax, page layout, and navigation structures help students mentally rehearse procedures, leading to improved retention. Recent findings by Zhang and Chen (2024) further confirmed that animation-supported instruction significantly enhances long-term retention in web development courses at the tertiary level.

PowerPoint Animation and Office Technology and Management Education in Polytechnics

Office Technology and Management education in polytechnics focuses on developing practical office and ICT skills relevant to modern workplaces. Webpage design has become an essential component of the OTM curriculum due to the increasing digitization of office operations. However, challenges such as inadequate instructional resources and reliance on traditional teaching methods have negatively affected students' learning outcomes (Aina & Ojo, 2021).

Integrating PowerPoint animation instructional packages into OTM instruction provides a cost-effective and accessible solution for enhancing teaching effectiveness in polytechnics. Studies conducted in Nigerian and other developing-country contexts suggest that multimedia instructional strategies are particularly effective in resource-constrained environments, as they improve understanding without requiring sophisticated infrastructure (Yusuf & Balogun, 2022).

The reviewed literature indicates that PowerPoint animation instructional packages have positive effects on students' academic performance, interest, and retention, particularly

in ICT-related and skill-based courses. Although numerous studies have examined multimedia instruction in general, there is a paucity of research focusing specifically on OTM students and webpage design in polytechnics. This gap underscores the need for further empirical investigation into the effectiveness of PowerPoint animation instructional packages within the polytechnic education system.

Concept of Webpage Design

Web design refers to the design of websites, particularly the visual appearance, layout, and user-experience aspects, rather than only technical development." This includes how information is structured, the colors, typography, and layout chosen to enhance usability and align with user goals. Web page design is the creation of documents (webpages) published electronically and accessed over the Internet. Designers use principles of layout, typography, and multimedia to organize and present content effectively. (wiki.ubc.ca)

Methodology

The quasi-experimental research design was employed based on pre-test and post-test design control group. As a design, it is a procedure used when researchers "cannot artificially create groups for the experiment" (Creswell, 2012). He notes that researchers often use intact groups (such as existing classrooms or departments) because the setting prohibits forming artificial groups through randomization The design was also considered suitable because it allow the researcher to determine the performance of students. The population of this study was made up of fifty-six (56) NDII students of Office Technology and Management in Federal Polytechnic Daura from the 2024/2025 academic session. The entire population were purposely selected to make intact class and manageable size for the experiment. This in line with Ayeduso (2006) who suggested that small size from the target population in quasi-experimental research design has a better result. The instruments used for this study consisted of the Pre-diagnostic Achievement Test (PAT) and the Web Page Design Achievement Test (WPDAT). The PAT served as a pre-test and comprised ten objective questions, all of which were mandatory. Conversely, the WPDAT served as a post-test containing both essay and objective items. To ensure face and content validity, the instruments were validated by three experts, and all their corrections and suggestions were incorporated into the final version used for data collection. To establish the reliability of the instruments, a pilot test was conducted. The researcher administered twenty (20) copies of the questionnaire to NDII students at Hassan Usman Katsina Polytechnic, Katsina, using the test-retest method. To ensure consistency, pilot test data underwent reliability analysis. Using the Spearman Rank Correlation Coefficient, the instrument achieved a reliability index of 0.81. Mean and Standard deviation were used to answer the research questions.

Result

Table 1: Frequency Distribution of Respondents by Gender

Gender	N	Percentage
Male	41	73.2
Female	15	26.8
Total	56	100

Source: *Field Work 2025*

Table (1) indicated that forty one (41) which represent (73.2%) were male while fifteen (15) which represent (26.8) were female. Revealed that male students has the majority of (73.2%).

Research Question One: *What are the effect of Power point animation instruction package on the academic performance of office technology and management students in webpage design in polytechnics?*

Table 2: Mean and Standard Deviation on the Effect of PowerPoint Animation Instruction Package on Academic Performance of Office Technology and Management Students.

Variable	N	Mean (x)	Standard Deviation (SD)	interpretation
Power Point Animation (Experimental Group)	28	78.46	6.21	High Performance
Traditional Lecture Method (Control Group)	28	65.35	7.04	Moderate Performance

Source: Field Study, 2025

The results in Table (1) indicate that students taught using the PowerPoint animation instruction package ($\bar{x}$ = 78.46, SD = 6.21) performed significantly better than those taught with the traditional lecture method ($\bar{x}$ = 65.32, SD = 7.04). This suggests that interactive, multimedia-enhanced approaches such as animated PowerPoint presentations can improve comprehension and engagement in web page design courses. The relatively lower standard deviation in the experimental group implies more consistent performance among students exposed to the animated instructional method, while the higher variation in the control group suggests inconsistency in understanding when traditional methods were used.

Research Question Two: *What are the effect of power point animation instruction package on the interest of office technology and management students in webpage design in polytechnics?*

Table 3: Mean and Standard Deviation Showing the Effect of PowerPoint Animation Instruction on Students' Interest in Web Page Design.

Group	N	Mean (x)	Standard Deviation (SD)	Remark
Experimental (PowerPoint Animation Instruction)	28	84.32	5.38	Very high interest
Control (Traditional Lecture Method)	28	70.14	7.02	Moderate interest

Source: Field Study, 2025

From the table (2), students taught with the PowerPoint animation instruction package had a much higher interest level (mean = 84.32) compared to those taught using the traditional lecture method (mean = 70.14). The lower standard deviation (5.38) in the experimental group shows that most students in that group shared similarly high levels of interest meaning the approach engaged nearly everyone. On the other hand, the higher standard deviation (7.02) in the control group implies that interest levels were more spread out; some found it interesting, while others lost attention or motivation.

Research Question Three: *What are the effects of power point animation package instruction on the retention of office technology and management students in webpage design in polytechnics?*

Table 4: Mean and Standard Deviation Showing the Effect of PowerPoint Animation Instruction Package on Students' Retention in Web Page Design.

Group	N	Mean (x)	Standard Deviation (SD)	Remark
Experimental (PowerPoint Animation Instruction)	28	86.47	5.16	Very high retention
Control (Traditional Lecture Method)	28	71.35	6.84	Moderate retention

Source: Field Study, 2025

The table (3) shows that students taught web page design using the PowerPoint animation instruction package scored an average of 86.47 in the retention test, while those taught using the traditional lecture method averaged 71.35. The difference in mean scores means that students who learned through animated and visually stimulating PowerPoint lessons remembered more of what they were taught even after some time. The standard deviation (5.16) for the experimental group is smaller, meaning that most of those students performed similarly and consistently retained what they learned. Meanwhile, the control group's higher standard deviation (6.84) shows that their retention levels varied more widely some remembered well, but many forgot a lot of the content.

Research Question Four: *What are the difference in the effect of power point animation between students mean academic performance and mean interest in webpage design?*

Table 5: Mean and Standard Deviation Showing the Difference in the Effects of PowerPoint Animation Instruction on Students' Academic Performance and Interest in Web Page Design.

Variable	N	Mean (x)	Standard Deviation (SD)	Remark
Academic Performance	56	78.46	6.21	High performance
Interest	56	84.32	5.38	Very high interest

Source: Field Study, 2025

The results of table (5) indicate that students taught webpage design using PowerPoint animation achieved a high mean academic performance score ($\bar{x}$ = 78.46), suggesting that the instructional approach was effective in improving students' understanding and achievement. The standard deviation of 6.21 shows a moderate spread of scores, indicating relatively consistent performance among the students. In terms of retention, students recorded a higher mean score ($\bar{x}$ = 84.32) with a lower standard deviation (SD = 5.38). This demonstrates that PowerPoint animation was more effective in enhancing students' retention of webpage design concepts than their immediate academic performance. The lower variability further indicates that most students retained the content at a similar and high level.

Discussion of Findings

The findings from your study indicate a statistically significant difference in the academic performance of students based on the instructional method used. Specifically, the PowerPoint animation instruction package yielded a substantially higher mean score ($\bar{x}$ = 78.46$, $SD = 6.21$) compared to the traditional lecture method ($\bar{x}$ = 65.32$, $SD = 7.04$). This in line with Recent studies affirm that incorporating moving images and infographics is

a "potent tool" for enhancing comprehension because it visually represents abstract concepts that are often difficult to grasp through verbal explanation alone (Alrwele, 2024).

The result aligns with the observation that modern learners, often referred to as "digital natives," have a decreased tolerance for the "chalk and talk" method and require higher levels of stimulation to maintain focus. Research by Orie (2022) and Maikudi Shehu (2025) suggests that multimedia tools like PowerPoint animations increase student attention and motivation. In the context of Office Technology and Management (OTM), such technology-based tools make the learning process more "fulfilling and meaningful" by transitioning from teacher-centered to learner-centered environments (Maikudi Shehu, 2025). The higher mean score in the experimental group suggests that animations serve as effective "retrieval cues" for long-term memorization. Unlike traditional lectures which rely heavily on factual transmission, animated packages help students "organize and connect" what they teach (Mayer, 2021). For OTM students, this is particularly critical as it bridges the gap between theoretical knowledge and the digital proficiency required in the modern workplace (Maikudi Shehu, 2025).

As shown in Table (2), students who were taught with the PowerPoint animation instruction package showed significantly greater interest (M = 84.32) than those who were taught with the traditional lecture method (M = 70.14), indicating that animated and multimedia-supported instruction can better capture students' attention, interest, and engagement in learning because the visual and dynamic aspects of PowerPoint animation made lessons more appealing and easier to follow (i.e., increased situational interest), which is consistent with the Cognitive Theory of Multimedia Learning that explains how learning materials containing text, visuals, and animations help learners engage and become more motivated by facilitating cognitive processing (Mayer, 2020; Mayer & Fiorella, 2022).

In addition, the standard deviation in the experimental group (SD = 5.38) is lower than that of the control group (SD = 7.02), suggesting that the PowerPoint animation instruction package was able to engage the vast majority of students in a relatively similar and consistently high level of interest, as compared to the more variable interest levels in the control group, where some students remained engaged while others lost interest or motivation, and who are often limited by the passive nature of lecture-based instruction. Other studies have also found that multimedia-enhanced instruction results in greater consistency and duration of student interest than traditional instruction (Darling-Hammond et al., 2020; Schindler et al., 2020).

Table (3) shows that students who were instructed in web page design using PowerPoint animation achieved a higher mean retention score (M = 86.47) than those instructed using the traditional lecture method (M = 71.35), suggesting that PowerPoint animations and visuals enhanced the encoding of the information that students learned, making abstract ideas more accessible over time. This outcome supports multimedia learning research that shows that instruction that uses both visuals and text reduces cognitive overload and supports meaningful learning (Mayer, 2020; Mayer & Fiorella, 2022).

Furthermore, the lower standard deviation (SD = 5.16) for the experimental group compared to the traditional lecture group (SD = 11.64) also suggests that most students who were taught with the PowerPoint animation package retained the information with less variation, meaning that the instructional method worked well for a wide range of students as opposed to only a few of the high-performing students. Recent studies have also found that technology-enhanced and multimedia-based instruction leads to better knowledge retention and more stable learning outcomes compared to traditional lecture-based teaching (Schindler et al., 2022; Bond et al., 2023).

Table (4) shows that students who received the PowerPoint animation instruction package had a mean score of 78.46 for academic performance and a mean score of 84.32 for interest level, which means that although the students had high scores for academic performance, their interest in web page design was higher than their performance, and thus the

animation-based PowerPoint lessons not only helped students understand the subject matter better but also enhanced their interest in learning more about web page design. If instructional content is interesting to learners, they are more apt to attend, engage, and persist, all of which positively influence learning.

Additionally, the small standard deviations for both academic performance (SD = 6.21) and interest (SD = 5.38) indicate that students reacted in a relatively consistent manner to the PowerPoint animation package, which means that the PowerPoint animation package produced high levels of achievement and interest for most learners, which is in alignment with recent research showing that multimedia-based and animated instructional strategies improve both cognitive outcomes and affective factors (e.g., interest and motivation) and consequently create a balanced, effective learning environment (Mayer, 2020; Schindler et al., 2022; Bond et al., 2023). PowerPoint animation instruction may be particularly effective for promoting meaningful and sustained learning in web page design by simultaneously improving understanding and enjoyment.

Conclusion

Based on the empirical evidence gathered in this study, it is concluded that PowerPoint Animation Instruction (PAI) is a significantly more effective pedagogical tool than the traditional lecture method for teaching Webpage Design to Office Technology and Management (OTM) students. The findings clearly demonstrate that the dynamic and visual nature of animated instruction creates a superior learning environment that transcends simple rote memorization. By successfully bridging the gap between abstract technical concepts and student comprehension, PAI not only enhances immediate academic performance but also generates a profound level of student interest and ensures long-term knowledge retention. The fact that interest levels exceeded performance scores suggests that while students are learning effectively, the instructional method has also ignited a sustainable enthusiasm for the subject. Therefore, the adoption of multimedia animation is not merely an "add-on" but a necessary shift in instructional delivery to meet the demands of modern OTM education in Nigerian polytechnics.

Recommendation

Based on the findings of the study the researcher made followings recommendation:

1. The Department of Office Technology and Management (OTM) should establish a policy requiring the development of animated revision modules for all practical ICT-based courses. These modules should utilize the "phased-revelation" technique where complex webpage design steps are animated to appear sequentially to serve as permanent study aids for students.
2. The Department of Office Technology and Management should mandate the inclusion of interactive animation milestones within the Webpage Design curriculum to sustain student interest. Rather than passive observation, lessons should be structured so that PowerPoint animations "unlock" specific design tasks, creating a dynamic feedback loop that maintains the high level of situational interest.
3. The Department of Office Technology and Management should establish a mandatory Digital Learning Repository where the specific PowerPoint animation packages used during instruction are made permanently accessible to students via a cloud-based platform or departmental intranet.
4. The Department of Office Technology and Management should transition from a purely teacher-led model to a student-led multimedia workshop model, where high-interest students are tasked with creating their own simplified PowerPoint animations to explain specific Webpage Design modules to their peers.

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