

EFFECT OF POWERPOINT PRESENTATION ON SENIOR SECONDARY STUDENTS' ACHIEVEMENT IN CIVIC EDUCATION

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ABSTRACT

This study examined the effect of PowerPoint Presentation (PPP) on the academic achievement of Senior Secondary (SSII) students in civic education within the Ogun Central Senatorial District, Nigeria. Guided by one research question and two null hypotheses, the study employed a pre-test, post-test, control group quasi-experimental design. A sample of 140 students was selected, and achievement was measured using the validated Civic Education Achievement Test (CEAT), which yielded a reliability index of 0.85. The experimental group received instruction via multimedia PowerPoint presentations, while the control group was taught using conventional "chalk-and-talk" method. Findings of hypothesis one show significant effect of PPP on students' achievement ($F_{(1,137)} = 214.472, P < 0.05$). Since p is less than 0.05, it shows significant difference in the post-test mean achievement scores of students taught with PPP and those taught with chalk and talk method. Findings of hypothesis two revealed no significant interaction effect of treatment and gender on students' achievement ($F_{(1, 137)} = .521, P > 0.05$). This shows there is no significant interaction effect of treatment and gender on the post -test mean achievement scores of students. Since p is greater than 0.05, this implies that there is no significant difference in the mean achievement scores of male and female students in the experimental group. Based on these findings, it is recommended that the Ministry of Education and school stakeholders prioritize teacher training workshops on the integration of multimedia technologies in the civic education curriculum to enhance pedagogical outcomes.

Keywords: *Academic Achievement, Civic Education, Curriculum, Multimedia, Powerpoint Presentation*

I. INTRODUCTION

The primary objective of civic education is to ensure that citizens acquire a foundational civic orientation from an early age. However, Adeosun (2021) argued that there is significant doubt regarding whether a substantial proportion of Nigerians possess adequate civic training. This deficit has severely hindered the cultivation of informed and responsible citizens capable of driving the nation's political, social, and economic development. Recognizing this challenge, Busola (2017) noted that the Nigerian government is making concerted efforts to address the issue directly by introducing civic education as a core subject in the secondary school curriculum. Contextualizing this need, Junaidu (2019) pointed out that during the 1980s, as Nigeria navigated the complexities of an emerging democracy, it became evident that the absence of civic education had created a profound gap in the populace's understanding of their socio-political responsibilities. Fundamentally, civic education is a deliberate process aimed at imparting the knowledge, skills, and dispositions necessary for active citizenship (Peterson, 2011). Its inclusion in the Nigerian secondary school curriculum is specifically designed to transmit appropriate values to the youth, empowering them to act responsibly and constructively within society (Abubakar, 2021). Furthermore, Muleya (2018) emphasized that the concept encompasses the competencies and attitudes children must acquire to become ethically grounded and civically engaged members of society.

Ugwuogo (2019) posited that civic education prepares youth for effective participation in democratic life, equipping them for future leadership roles. This educational framework aims to cultivate citizens who are politically active, informed, responsive, and responsible (Rob van Otterdijk, 2016). Williams (2014) observed that Nigerian society highly values civic virtues such as honesty, tolerance, justice, and integrity. Consequently, Junaidu (2019) argued that integrating civic education as a core secondary school subject promotes leadership training, participatory democracy, and nation-building. Ultimately, equipping students with an in-depth understanding of their rights and responsibilities ensures they can make informed decisions as citizens and act ethically as future leaders. Despite the curriculum's emphasis on this subject, Ugwuogo (2019) noted that students often struggle to comprehend key concepts, raising concerns among educational stakeholders. For instance, the West African Senior School Certificate Examination (WASSCE) Chief Examiners' reports from 2020 to 2023 indicate that a majority of candidates struggle with questions related to citizenship, democratic duties, and human rights, which negatively impacts their overall performance. This widespread difficulty suggests that the curriculum's objectives remain largely unfulfilled, potentially leaving future leaders with inadequate civic training.

This widespread underachievement can be attributed to several pedagogical factors. Adeyemi (2020) and Abubakar (2021) identified teachers' reliance on conventional, teacher-centered methods, poor communication skills, and outdated instructional media as primary culprits. To ensure effective civic training, Adeosun (2021) advocated for a paradigm shift from traditional methods to innovative, technology-driven strategies, such as multimedia simulations, artificial intelligence, and interactive media. Currently, Nigerian classrooms across all educational levels are predominantly equipped with traditional markerboards. These analogue tools are ill-suited for large group instruction, lack data storage capabilities, and fail

to foster creativity, critical thinking, or collaborative skills (Onah et al., 2020). To improve learning outcomes, educators must adopt multimedia presentations that engage the visual, auditory, and kinesthetic senses. PowerPoint Presentation (PPP), a digital multimedia application, offers a viable solution (Aifan, 2022; LeFebvre et al., 2022). By integrating diverse multimedia elements such as images, videos, animations, and charts, PowerPoint accommodates varied learning styles and transforms content delivery into a more interactive and memorable experience, particularly for students who benefit from cognitive multimedia processing (Chung & Intan, 2025).

Extensive research underscores the efficacy of emerging instructional technologies in enhancing academic achievement across various subjects (Wijayasundara, 2020). Academic achievement, defined as a specified level of learning accomplishment assessed through standardized tests or teacher evaluations (Bhat & Bhardwaj, 2014), is frequently linked to teaching methodologies and instructional media (Eslamian & Khademi, 2017). While the direct impact of Information and Communication Technology (ICT) on student performance has been heavily debated with some studies reporting no significant relationship (Hussain, 2022), methodological gaps in previous research remain unresolved (Olufemi et al., 2024; Mensah et al., 2023). Furthermore, the influence of gender on academic achievement remains a contested issue (Ozturk et al., 2020). While some studies suggest girls outperform boys in the humanities and social sciences (Njoku & Usman, 2013; Pitan & Muller, 2020), others find persistent female underperformance in STEM fields (Keller et al., 2022). Regarding multimedia instruction specifically, Oke et al. (2018) found no significant gender differences in achievement when using PowerPoint, whereas Peter (2014) reported that female students benefited significantly more than males. Given these inconsistencies, it is necessary to examine the moderating effect of gender on students' achievement in civic education when taught using PPP.

Ultimately, while numerous theoretical studies have addressed the challenges in teaching civic education, there is a notable dearth of empirical research employing innovative technological tools. Although, multimedia PowerPoint has been shown to enhance learning outcomes in other disciplines, empirical studies investigating its application in civic education are scarce. To address this knowledge gap, this study empirically examines the effect of PowerPoint Presentations on the academic achievement of Senior Secondary (SSII) students in civic education within the Ogun Central Senatorial District of Nigeria.

1.2 Research Hypotheses

H₀1: There is no significant main effect of treatment on students' achievement in civic education

H₀2: There is no significant main effect of treatment and gender on students' achievement in civic education

II. LITERATURE REVIEW

2.1 Empirical Review

Empirical literature presents mixed findings regarding the instructional efficacy of PowerPoint presentations. While numerous studies indicate that PPT enhances students' academic achievement, a subset of research suggests its impact is not universally significant across all subjects. Among the studies demonstrating positive outcomes, Erdemir (2022) compared traditional lectures with audio-visual PPTs among 90 physics student-teachers, finding that the PPT group achieved higher scores. Similarly, Imizuokena (2022) observed a significant performance difference in senior secondary biology, with the PPT-instructed group outperforming the lecture group (mean scores of 59.3 and 57.5, respectively). This positive trend is echoed across various disciplines. For instance, Adamu (2018) reported that senior secondary students taught metalwork technology using PPT performed significantly better than those taught via conventional methods. Comparable improvements were documented in geography (Roberts, 2018), geometry (Mensah & Nabi, 2021), and English Language (Uzun & Kilis, 2019), all of which concluded that PPT-instructed students significantly outperformed their control group counterparts.

Conversely, several studies report no significant academic advantage to using PowerPoint. Diepiribo (2022) conducted a quasi-experimental study with 87 biology students in Yenagoa, Nigeria, and found no statistically significant difference in achievement between students taught with a PPT-enhanced strategy and those taught using the traditional "chalk and talk" method. Similarly, Lari (2014) observed that social studies students instructed with PPT were not significantly more motivated than the control group, and Hassan et al. (2014) reported that PPT did not significantly enhance the performance of medical students compared to conventional teaching methods.

Another critical variable of interest is the interactive effect of gender on students' academic achievement when taught using PowerPoint. The role of gender in academic performance has historically generated considerable debate due to conflicting empirical results, and the literature currently lacks a consensus regarding gender-based differences in civic education achievement. Several studies report no significant gender differences following multimedia interventions. For instance, Ani et al. (2021) found no significant difference in the post-test achievement of male and female Basic Science students after a six-week intervention. Equivalent improvements were also observed among male and female students taught with PPT in Christian Religious Studies (Ikwuka et al., 2021) and Social Studies (Ikwuka & Onimisi, 2024), suggesting the technique was equally effective for both sexes. Vera (2024) corroborated these findings, reporting no significant moderating effect of gender on student performance. In contrast, other studies highlight distinct gender disparities. Osijirin et al. (2025) found that male secondary school students significantly outperformed their female counterparts in computer studies. Conversely, Emudianughe et al. (2025) employed a quasi-experimental design to investigate the effect of graphics on Upper Basic 8 social studies students, revealing that female students experienced a significantly higher mean gain in academic performance following the intervention.

2.2 Theoretical Framework:

This study is anchored in the Cognitive Theory of Multimedia Learning (CTML), developed by Richard Mayer (1997), which posits that individuals learn more effectively from multimedia presentations than from single-channel formats like text alone. According to Mayer (2024), CTML explains that learning occurs through two distinct processing channels: a verbal channel for auditory and textual information, and a visual channel for graphics and images. The contemporary understanding of CTML emphasizes the cognitive processing of information, taking into account the human information processing system, the limited capacity of working memory, and the dual-channel nature of learning (Mautone & Mayer, 2001). As a cornerstone framework in educational psychology, CTML underscores the efficacy of integrating multimedia tools such as PPT with videos, simulations, smartboards, and interactive AI-generated content to optimize learning. Mayer's theory asserts that presenting information simultaneously through both channels facilitates deeper comprehension and superior knowledge retention (LeFebvre et al., 2022). This theory is highly relevant for understanding how multimedia presentations can elevate student achievement in civic education. By utilizing PowerPoint to integrate computer graphics, audio, video, animations, and simulations of democratic scenarios, educators can create immersive and memorable learning experiences that adhere to CTML principles, thereby enhancing overall academic achievement in civic education, especially in Nigerian secondary schools.

III. RESEARCH METHODS

This study adopted a pre-test, post-test, control group quasi-experimental design with 2x2 factorial matrix: instructional strategy (PowerPoint vs. conventional method) and gender (male vs. female). This design was selected because it allows for the manipulation of independent variables and the analysis of gain scores (the difference between pre-test and post-test scores). The target population comprised all Senior Secondary School II (SSII) students in the Ogun Central Senatorial District of Ogun State, Nigeria. This specific class level was chosen because the students were not preparing for any imminent external examinations, ensuring their consistent availability throughout the experiment. A total of 140 students constituted the sample for the study. Two local government areas within the district were randomly selected, and one public co-educational senior secondary school was purposively chosen from each area. These two schools were then randomly assigned to either the experimental or the control group. Finally, one intact class was selected from each of the two schools.

3.1 Instrumentation: Instructional Guide (IGCEP)

The Instructional Guide for Civic Education PowerPoint (IGCEP) was a self-developed instrument utilized by the research assistants for the experimental group. It contained comprehensive lesson plans for the six-week treatment period, divided into two primary sections. The first section detailed the administrative and pedagogical framework: week, date, subject, class, topic, sub-topic, duration, period, reference materials, instructional media, students' previous knowledge, and behavioral objectives. The second section outlined the instructional procedure, breaking down the content delivery, presentation steps, evaluation, and

assignments. The IGCEP provided clear, step-by-step guidelines for delivering the lesson content using PowerPoint Presentations (PPP) as the primary instructional medium. To ensure face and content validity, the draft was reviewed by experts in political science, experienced secondary school civic education teachers, and educational technology specialists, whose feedback was incorporated into the final version.

3.2 Instrumentation: Achievement Test (CEAT)

The Civic Education Achievement Test (CEAT) was a self-developed instrument designed to measure students' academic performance in the subject. Section A collected demographic data, such as gender. Section B comprised 50 multiple-choice objective questions (with options A–D and one correct answer) based on selected topics from the SSII civic education syllabus. The items were drawn from standardized, past West African Examinations Council (WAEC) Civic Education papers from 2019 to 2023. The covered topics included: citizenship, duties and obligations of citizens, promotion of traditions and customs, integrity, unity, democracy, and reasons leaders fail to protect followers' interests. The questions were designed to assess Bloom's taxonomy of cognitive domains, specifically focusing on knowledge, comprehension, and application.

To establish validity, the CEAT was evaluated by test construction experts and veteran civic education teachers. To determine the psychometric properties of the test items, an initial pool of 120 questions was administered to 30 students who shared similar characteristics with the target population but were not part of the study sample. Item analysis was conducted to evaluate difficulty and discrimination indices, while acceptable range of 0.30 or above was considered satisfactory since they effectively distinguished between high and low performing students. The 50 items that performed best in this analysis were selected for the final instrument. To measure internal consistency, the finalized test was administered to 20 non-participating students with similar attributes. The results were analyzed using the Kuder-Richardson Formula 21 (KR-21), yielding a strong reliability index of 0.85. During the data collection phase, the researchers visited the two selected schools. After fully explaining the study's objectives, they sought formal permission from the school principals and enlisted the cooperation of the school's civic education teachers, who served as research assistants. The specific treatment procedures for the two groups were implemented as follows:

3.3 Treatment Procedure: Experimental Group

The experimental procedure spanned nine weeks. During the first week, the research assistant (the school's regular civic education teacher) received training on the procedures for administering both the instructional guide (IGCEP) and the achievement test (CEAT). In the second week, the teacher administered the pre-test (CEAT) to establish the students' baseline knowledge. From the third to the eighth week, the teacher delivered the civic education curriculum using PowerPoint Presentations (PPP), which were projected onto an interactive smartboard in the classroom. The PPP interface integrated computer graphics, audio narrations, documentary illustrations, video clips, and multimedia simulations to illustrate concepts such as democratic principles, the electoral process, customs and traditions, citizens' rights, and civic duties related to civic education topics. This multimedia approach was designed to engage and

motivate students, fostering a highly interactive learning environment intended to enhance academic performance. To monitor student progress, a brief formative assessment comprising ten multiple-choice questions and a take-home assignment were administered at the conclusion of each lesson. Finally, in the ninth week, the post-test (the same CEAT instrument) was administered to the students.

3.4 Treatment Procedure: Control Group

The control group followed a similar nine-week timeline. During the first week, the teacher introduced the general objectives of the upcoming lessons to the students. In the second week, the pre-test (CEAT) was administered. From the third to the eighth week, the research assistant taught the exact same civic education content to the students; however, instruction relied solely on the conventional "chalk-and-talk" (traditional lecture) method, without any multimedia integration. In the ninth week, the post-test (CEAT) was administered. Following the conclusion of the experiment, the hypotheses raised were statistically tested with analysis of covariance (ANCOVA) at 0.05 level of significance.

IV. RESULTS: Data analysis of the hypotheses has been changed to ANCOVA as suggested by the reviewers in the revised version.

Table 1: Mean and standard deviation results showing differences in mean gain in civic education

Instructional strategies		N	Mean	SD	Mean Gain/loss
PowerPoint Presentation	Pre-test	68	51.24	3.241	9.18
	Post-test	68	60.42	5.176	
Conventional Method	Pre-test	72	48.25	2.321	6.07
	Post-test	72	54.32	3.294	
Total	Pre-test	140	49.75	2.413	7.62
	Post-test	140	57.37	3.268	

Table 1 presents the descriptive statistics comparing the academic achievement of the experimental and control groups. The results indicate that the experimental group, which was instructed using PowerPoint Presentations (PPP), attained a post-test mean score of 60.42. In contrast, the control group, instructed via conventional methods, recorded a lower post-test mean score of 54.32. Furthermore, an analysis of the mean gain (calculated as the difference between post-test and pre-test scores) reveals that students in the experimental group experienced a higher mean gain of 9.18, compared to a mean gain of 6.07 for the control group. These findings suggest that the integration of multimedia PowerPoint presentations into the civic education curriculum resulted in a more substantial improvement in student achievement compared to traditional teaching methods.

Table 2: T-test of independent sample results showing civic education achievement between students taught with PowerPoint Presentation and those taught with conventional method

Test	Group	N	Mean	Std. Deviation	t	df	Sig.(2-tailed)
Post Test	Experimental Group	68	60.42	5.17	4.02	138	0.025
	Control Group	72	54.32	3.29			

Table 2 presents the results of the independent samples t-test comparing the post-test academic achievement scores of students in the experimental and control groups. The analysis yielded a calculated t-value of 4.02 with 138 degrees of freedom. The associated p-value (Sig. 2-tailed) of 0.025 is less than the alpha level of 0.05. Consequently, the null hypothesis, which posited no significant difference in the academic achievement of students taught civic education using PowerPoint Presentations (PPP) and those taught using conventional methods, is rejected. This indicates a statistically significant difference in achievement between the two groups, with the experimental group demonstrating superior performance.

Table 3: T-test of independent samples results showing differences in achievement of male and female taught civic education with PowerPoint

Test	Group	N	Mean	Std. Deviation	t	df	Sig.(2-tailed)
Post Test	Male	37	60.41	5.12	1.44	66	0.095
	Female	31	60.40	5.16			

Table 3 illustrates the comparative analysis of post-test scores between male and female students within the experimental group to determine the influence of gender on achievement when taught via PowerPoint. The analysis yielded a calculated t-value of 1.44 with 66 degrees of freedom. The associated p-value of 0.095 exceeds the alpha level of 0.05. These results indicate no statistically significant difference in the academic achievement of male and female students when exposed to PowerPoint-enhanced instruction. Consequently, the null hypothesis which posited that gender does not significantly influence the academic achievement of students in the experimental group is accepted. This suggests that the use of multimedia PowerPoint presentations as an instructional strategy is equally effective for both male and female students in the context of civic education.

V. DISCUSSION

The results of this study indicate that students in the experimental group, who were instructed using PowerPoint Presentations (PPP), recorded a substantially higher mean gain in civic education achievement compared to those in the control group. Furthermore, the test of hypothesis one confirmed a statistically significant difference in academic performance between the two groups. These findings provide empirical support for Mayer's (1997) Cognitive Theory of Multimedia Learning, demonstrating that the dual-channel processing of verbal and visual information significantly enhances retention and understanding compared to the single-channel format of traditional 'chalk-and-talk' instruction. These findings align with

those of Erdemir (2022), who observed that physics student-teachers taught with PPP-supported lectures achieved higher grades than their peers instructed through traditional methods. Similarly, the results corroborate Imizuokena (2022), whose study on biology students demonstrated that projected multimedia presentations significantly enhanced performance over conventional teaching strategies.

This observed superiority of PPP-based instruction may be attributed to the integration of multimedia elements such as images, graphics, videos, and animations. These features provide significant motivation, encouraging students to engage more deeply with the material and sustain their attention in the classroom. By transforming abstract concepts such as democracy, citizenship, traditions, and civic duties into concrete visual and auditory experiences, multimedia tools facilitate a deeper cognitive understanding civic education. While the use of PPP is a primary factor, it is likely that contextual variables, including teacher delivery, classroom environment, and students' prior exposure to ICT, also contributed to the overall achievement gains.

Regarding hypothesis two, the results revealed no statistically significant difference in academic achievement between male and female students within the experimental group. This finding is consistent with the literature; for example, Ikwuka et al. (2021) and Ikwuka and Onimisi (2024) reported that gender did not moderate academic improvement in Christian Religious Studies and Social Studies, respectively, when taught using PowerPoint. Similarly, Ani et al. (2021) found no significant gender-based disparity in achievement among Basic Science students exposed to PPP. The lack of gender-based divergence in this study suggests that PowerPoint is a gender-neutral instructional strategy in the context of civic education. The inclusion of interactive multimedia content such as simulations of civic duties and responsibilities likely renders the lesson equally entertaining, interesting, and motivating for all learners, effectively neutralizing traditional gender-based differences in academic performance. By providing a rich, multimodal learning experience, PPP allows all students, regardless of gender, to process information more effectively.

VI. CONCLUSION AND RECOMMENDATIONS

This study established that the use of PowerPoint Presentation (PPP) as an instructional tool significantly enhances students' academic achievement in civic education compared to traditional "chalk-and-talk" methods. Furthermore, the findings demonstrated that PowerPoint is a gender-neutral instructional package, as evidenced by the lack of significant performance disparity between male and female students exposed to the intervention. These results suggest that multimedia-driven instruction effectively caters to diverse learners and promotes equitable academic outcomes.

In light of these findings, the application of PowerPoint as an innovative instructional device is highly recommended for the delivery of civic education. To facilitate this transition, the following recommendations are proposed:

1. The Ministry of Education and school administrators should organize regular workshops, webinars, and symposia to train civic education teachers on the effective design and implementation of PowerPoint-driven instruction.
2. Educational stakeholders must prioritize funding for the development and supply of multimedia instructional software and the necessary hardware (e.g., projectors and smartboards) to secondary schools.
3. Schools should actively encourage and incentivize civic education teachers to integrate digital tools into their daily pedagogical practices, ensuring that the benefits of multimedia learning are realized in classrooms where infrastructure is available.

VII. LIMITATION

While the findings are compelling, the study's scope was limited to one senatorial district, only two schools two intact classes; thus, the results should be generalized cautiously. This suggests that further research across diverse geographical and socioeconomic contexts in Nigeria is warranted.

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