

## **Influence of Gender on the Effectiveness of Multimedia Instruction in Christian Religious Studies in Edo State, Nigeria**

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### **Abstract**

*This study investigated the influence of gender on the effectiveness of multimedia instruction in Christian Religious Studies (CRS) among secondary school students in Edo State, Nigeria. Using a quasi-experimental pretest-posttest control group design, 156 SS II students were selected through multistage sampling. The experimental group received multimedia instructional intervention while the control group was taught using traditional methods. Data were collected using the Christian Religious Studies Achievement Test (CRSAT) and the Christian Religious Studies Interest Scale (CRSIS). Data were analysed using two-way Analysis of Variance (ANOVA) to examine the interaction effects of instructional strategy and gender on students' achievement and interest. Results revealed no significant gender differences in students' posttest achievement and interest scores under multimedia instruction. The findings suggest that multimedia instructional approaches can benefit both male and female students similarly in CRS contexts. Implications for curriculum innovation, teacher training, and gender-responsive pedagogy are discussed.*

**Keywords:** Multimedia instruction, Gender differences, Christian Religious Studies, Academic achievement, Student interest.

### **Introduction**

Education is widely recognised as a powerful tool for national development, social stability, and moral transformation. It does not only focus

on developing intellectual abilities but also aims at shaping learners' attitudes, values, and behaviour necessary for responsible citizenship (Adaralegbe, 2018; Bidemi & Sunday, 2024). In developing countries such as Nigeria,

education is expected to address societal challenges such as moral decline, youth restiveness, and lack of ethical responsibility among young people. As a result, greater attention is being given to school subjects that promote moral development and value orientation.

In Nigeria, concerns about the declining moral standards among youths have become increasingly prominent. Issues such as examination malpractice, cultism, cybercrime, dishonesty, violence, and general indiscipline are frequently reported in schools and society. These problems have raised serious questions about the effectiveness of moral education in the school system. Consequently, educators, policymakers, and religious leaders have continued to emphasize the importance of value-oriented subjects in the curriculum, particularly Christian Religious Studies (CRS).

Christian Religious Studies is designed to promote moral values, spiritual awareness, and responsible living among students through biblical teachings and Christian ethical principles. The subject is taught at both junior and senior secondary school levels in Nigeria and is expected to

guide students in developing positive character traits and moral discipline. Through the study of biblical narratives, teachings of Jesus Christ, and Christian moral principles, CRS aims to prepare students to become morally upright individuals who contribute positively to society.

Despite the importance of CRS in promoting moral development, students' interest and academic achievement in the subject have remained relatively low in many Nigerian secondary schools. Reports from examinations and classroom assessments often reveal poor performance and weak engagement among students. Researchers have attributed this problem to several factors, including students' perception that CRS is abstract or less relevant to modern life, limited instructional materials, and ineffective teaching strategies.

One major concern raised by scholars is the continued use of traditional teaching methods in CRS classrooms. Many teachers still rely heavily on lecture-based approaches, where students are expected to listen, memorise, and reproduce information during examinations. Such teacher-

centred approaches often limit students' participation, creativity, and critical thinking. Since CRS requires reflection on moral values and application of biblical teachings to real-life situations, these conventional methods may not effectively support meaningful learning.

In response to these challenges, educational researchers have suggested the use of innovative instructional approaches, particularly multimedia instructional strategies. Multimedia instruction refers to the use of various media forms such as text, images, audio, video, animations, and interactive presentations to support teaching and learning. This approach is based on the Cognitive Theory of Multimedia Learning, which states that learners understand and retain information better when both visual and auditory channels are stimulated.

Studies have shown that multimedia instruction can improve students' comprehension, retention, and motivation during learning. By presenting information in multiple formats, multimedia makes lessons more interesting and easier to understand. In classroom settings, it can also encourage interaction,

discussion, and deeper engagement with the learning material.

In the context of Christian Religious Studies, multimedia resources have great potential to enhance teaching and learning. For example, biblical stories can be presented through dramatized videos, visual illustrations, documentary clips, and interactive slides. Moral scenarios can also be demonstrated through real-life simulations or storytelling videos. Such approaches help students visualize historical events in the Bible and better understand religious concepts and moral lessons.

By making CRS lessons more engaging and realistic, multimedia instruction can help bridge the gap between abstract biblical teachings and students' everyday experiences. As a result, it has been recommended as an effective strategy for improving students' interest and academic performance in CRS classrooms.

However, while multimedia instruction appears promising, its effectiveness may vary among different groups of learners. One important learner-related factor that researchers often examine is gender. Gender refers to the social and cultural distinctions between males and

females and how these differences may influence learning behaviour and academic performance.

Educational researchers have long debated whether male and female students differ in their learning outcomes, motivation, and responses to instructional strategies. Some scholars argue that differences in socialisation patterns, cognitive styles, and learning preferences may affect how male and female learners interact with technology-based instruction.

For example, some studies have suggested that male students may show greater confidence or familiarity with digital tools, which could influence their performance in multimedia-supported learning environments. On the other hand, other researchers argue that well-designed instructional strategies can benefit both male and female learners equally, regardless of gender differences.

Empirical findings on gender differences in multimedia learning environments have therefore been inconsistent. Some studies conducted in science and technology education report that male students perform better when multimedia tools are used, while others find no significant

differences between male and female students (Abubakar, 2017; Enikanolaye, 2021).

These mixed results indicate that the influence of gender on multimedia learning may depend on factors such as the subject being taught, the design of the instructional materials, the teacher's competence, and the learning environment.

Within the field of Christian Religious Studies, research on gender differences in multimedia instruction is still relatively limited. However, a few available studies provide useful insights. For instance, Ojo and Jambelang (2025) found a significant difference in the academic performance of male and female students when mobile instructional applications were used in CRS, with male students performing slightly better.

In contrast, other studies have reported that multimedia-based instructional strategies improve students' interest and motivation in CRS without significant gender differences. These conflicting findings suggest that the relationship between gender and multimedia instruction in CRS

classrooms is not yet clearly understood.

The inconsistent nature of existing research therefore highlights the need for further investigation, particularly within Nigerian secondary schools. Contextual factors such as cultural expectations, classroom practices, teacher competence, and access to technological resources may influence how male and female students respond to multimedia instruction.

Another important issue is that most previous multimedia studies have focused on science-related subjects such as mathematics, physics, and computer studies. Humanities subjects, including religious education, have received relatively little attention in multimedia research.

This lack of research creates a gap in knowledge regarding the effectiveness of multimedia instructional strategies in Christian Religious Studies. Specifically, there is limited empirical evidence on whether male and female students benefit equally from multimedia-based CRS instruction in terms of their academic achievement and interest. In order to address this gap, the present study examined the influence of gender on the

effectiveness of multimedia instructional strategies in Christian Religious Studies among secondary school students in Edo State, Nigeria.

The study specifically investigated whether male and female students differ significantly in their academic achievement and level of interest in CRS when taught using multimedia instructional strategies. By exploring these issues, the study contributes to the ongoing discussion on gender equity in education and the effective use of technology in teaching and learning. The findings are expected to provide useful insights for teachers, curriculum developers, and educational policymakers on how multimedia strategies can be effectively integrated into CRS classrooms to enhance learning outcomes for all students.

### **Statement of the Problem**

Despite the moral and educational objectives of Christian Religious Studies, students' performance and interest in the subject remain consistently low in Nigerian secondary schools. Reports from public examinations and school-based assessments indicate that many learners perceive CRS as abstract, monotonous, and disconnected from

real-life experiences. Teacher-centred instructional methods, characterised by rote memorisation and lecture-based delivery, have been identified as a major contributor to low engagement and poor academic outcomes.

Although multimedia instructional strategies have been proposed to enhance students' engagement and learning outcomes, empirical evidence regarding their effectiveness in CRS remains limited. In particular, it is unclear whether male and female students benefit equally from multimedia instruction, as studies in other subjects have produced mixed findings. Some research suggests that gender may moderate the effectiveness of technology-based instruction, while other studies report no significant differences.

This gap in knowledge highlights the need to investigate whether the gender of students influences the effectiveness of multimedia instructional strategies in CRS. Understanding this relationship is essential for designing gender-inclusive instructional interventions that improve both student interest and academic achievement in CRS classrooms.

### **Purpose of the Study**

The main purpose of this study was to investigate the influence of gender on the effectiveness of multimedia instructional strategies on students' academic achievement and interest in Christian Religious Studies (CRS) among secondary school students in Edo State, Nigeria. Specifically, the study sought to:

1. Determine the interaction effect of instructional strategies (multimedia vs. Convectional) and gender (male and female) on the posttest mean interest scores of CRS students.
2. Examine the interaction effect of instructional strategies (multimedia vs. Conventional) and gender (male and female) on the posttest mean academic achievement scores of CRS students.

### **Research Questions**

1. What is the interaction effect of instructional strategies and gender on the posttest mean interest scores of CRS students?
2. What is the interaction effect of instructional strategies and gender on the posttest mean academic achievement scores of CRS students?

### **Hypotheses**

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

1. There is no significant interaction effect of instructional strategies and gender on the posttest mean interest scores of CRS students.
2. There is no significant interaction effect of instructional strategies and gender on the posttest mean academic achievements scores of CRS students .

### **Theoretical Framework and Review of Related Literature**

#### **Theoretical Framework**

The study is grounded in the Cognitive Theory of Multimedia Learning developed by Richard E. Mayer. The theory explains that students learn more effectively when information is presented through both visual and auditory channels. It assumes that learners process information through dual channels with limited cognitive capacity and actively construct meaning from instructional materials (Mayer, 2021). In Christian Religious Studies, multimedia resources such as videos, images, and audio narratives can help students better understand biblical teachings and moral concepts. These multimedia elements make abstract religious ideas more concrete

and engaging, thereby improving students' interest and academic achievement (Sijabat, M. 2025).

#### **The literature is reviewed on the following sub-headings:**

##### **Concept of Christian Religious Studies and Moral Education**

Christian Religious Studies (CRS) is a key subject in the Nigerian secondary school curriculum designed to promote students' moral, spiritual, and ethical development. The subject exposes learners to biblical teachings, Christian doctrines, and moral values that shape character and behaviour (Ilechukwu & Usulor, 2019; Efidu, 2022). Through biblical narratives, CRS encourages virtues such as honesty, love, justice, tolerance, and responsibility needed for peaceful coexistence. Scholars argue that CRS can help address moral decadence among youths in Nigeria (Fasuba, 2024; Gana & Ajibola, 2023). However, the achievement of these objectives largely depends on teaching methods. Traditional teacher-centred approaches based on memorisation often limit students' critical thinking and moral reasoning, making CRS lessons appear abstract and less connected to real-life experiences.

## **Multimedia Instruction in Secondary School Education**

Multimedia instruction involves the integration of various media such as text, images, audio, video, and animations in teaching and learning (Mayer, 2021). It is grounded in the Cognitive Theory of Multimedia Learning, which explains that learners process information through visual and auditory channels. Studies show that multimedia instruction improves students' comprehension, retention, and motivation (Ifenthaler & Yau, 2020; Park et al., 2019). In secondary schools, multimedia tools make learning more engaging and interactive. In religious education, biblical stories and moral lessons can be presented through dramatized videos, visual images, and audio commentaries, helping students better understand religious concepts and historical contexts. The adoption of multimedia in Nigerian schools is increasing due to the growing emphasis on technology integration in education (Agbaje & Adesina, 2021).

## **Student Interest and Academic Achievement in CRS**

Student interest plays an important role in determining academic achievement because it influences attention,

engagement, and persistence in learning (Ado, 2020). However, several studies have reported low interest and achievement in CRS due to monotonous teaching methods and lack of instructional innovation (Okafor & Uche, 2023; Fasuba, 2024). Multimedia instruction has been suggested as a strategy for improving students' interest and academic performance by making lessons more interactive and meaningful.

## **Gender Differences and Empirical Evidence**

Research on gender differences in multimedia learning has produced mixed findings. Some studies indicate differences in students' engagement with digital tools, while others report no significant gender differences in achievement or interest (Enikanolaye, 2021; Sung & Mayer, 2013). Empirical studies also show inconsistent results regarding the influence of multimedia instruction and gender on learning outcomes (Nkrumah et al., 2020; Adu-Gyamfi et al., 2021). While some studies found that multimedia improves students' motivation regardless of gender (Idris & Abubakar, 2023; Akinyemi & Makinde, 2025), others reported slight male advantages

in achievement when digital tools were used (Ojo & Jambelang, 2025).

### **Gaps in Literature**

Despite the recognized importance of CRS in moral education, research on the effectiveness of multimedia instruction in CRS remains limited, particularly in Nigeria. Most previous studies focus on science subjects rather than religious education. In addition, few studies examine gender as a moderating variable in multimedia-based CRS instruction. This gap therefore necessitated the present study, which investigated the influence of gender on the effectiveness of multimedia instruction on students' interest and academic achievement in CRS in Edo State, Nigeria.

### **Methodology**

#### **Research Design**

This study adopted a quasiexperimental pretest–posttest nonequivalent control group design, which is commonly used in educational intervention research where random assignment is impractical but intact classes can be compared (Agbaje & Adesina, 2021; Creswell, 2014). The design allowed for the examination of the schools in

Ovia North-East Local Government Area, Edo State.

### **Population and Sample**

The population comprised 1,503 SS II students in public secondary schools in Ovia North-East LGA, Edo State. A sample of 156 students was drawn using multistage sampling:

**Stage 1:** Selection of schools based on gender (male and female).

**Stage 2:** Selection of classes within the chosen schools.

**Stage 3:** Random selection of students from the selected classes, ensuring a balanced representation of male and female students, as well as experimental (multimedia) and control (conventional) groups.

The sample was distributed across **four groups** for the interaction analysis:

Male school – Multimedia instruction

Male school – Conventional instruction

Female school – Multimedia instruction

Female school – Conventional instruction

### **Instruments**

Two instruments were used to collect data: Christian Religious Studies Achievement Test (CRSAT) : Measured students' knowledge and understanding of CRS concepts. The instrument was validated by experts in Religious Studies and Education, with a reliability coefficient of 0.88.

Christian Religious Studies Interest Scale (CRSIS): Assessed students' interest and motivation in CRS. The scale was also validated and yielded a reliability coefficient of 0.89. Both instruments employed Likert-type items for interest and multiple-choice items for achievement.

### **Procedure**

**Pretest:** Both experimental and control groups completed the CRSAT and CRSIS before the intervention to establish baseline scores.

**Intervention:** The experimental groups were taught using a multimedia instructional package integrating audio, video, text, animations, and interactive exercises. The control groups received conventional lecture-based instruction using chalk-and-talk.

**Posttest:** After the instructional period, all groups completed the same instruments to measure post intervention interest and achievement. Teachers

### **Results**

implementing the multimedia package received orientation and training to ensure fidelity of implementation.

### **Data Analysis**

Data were analyzed using descriptive and inferential statistics: Descriptive statistics (mean and standard deviation) were computed to summarize students' posttest interest and achievement scores across the four groups. Two-way Analysis of Variance (ANOVA) was employed to test the interaction effect of instructional strategies (multimedia vs. conventional) and gender (male vs. female) on posttest mean scores for interest and academic achievement. The main effects of instructional strategy and gender were examined. The interaction effect (Instruction  $\times$  Gender) was tested to determine whether the effectiveness of multimedia instruction varies by gender. Independent samples t-tests were conducted where necessary to explore pairwise comparisons between groups. All hypotheses were tested at the 0.05 level of significance. Effect sizes (partial eta squared) were reported for ANOVA to indicate the practical significance of the findings.

**Hypothesis 1:** There is no significant interaction effect of instructional package and gender on the posttest mean interest scores of CRS students

Table 1: Descriptive statistics on the interaction effect of instructional package and gender on the posttest mean interest scores of CRS students.

Gender	Group	Mean	Std. Deviation	N
Male	Post Control	4.6667	1.19722	23
	Post Experimental	4.7619	1.09109	26
	<b>Total</b>	<b>4.7143</b>	<b>1.13236</b>	<b>49</b>
Female	Post Control	4.7778	1.09291	11
	Post Experimental	4.6154	1.04391	17
	<b>Total</b>	<b>4.6818</b>	<b>1.04135</b>	<b>28</b>

The descriptive statistics indicate that students in the post-control group (M = 4.70, SD = 1.15) and the post-experimental group (M = 4.71, SD = 1.06) reported almost identical levels of interest. Male students (M = 4.71) and female students (M = 4.68) also had very similar mean scores. Within groups, males in the experimental condition reported slightly higher interest than males in the control condition, whereas females in the control condition reported slightly higher interest than those in the experimental condition. However, these differences were very small, suggesting that neither gender nor group membership had a substantial influence on students' posttest interest levels.

**Table 2:** Two - way ANOVA on the interaction effect of instructional package and gender on the posttest mean interest scores of CRS students

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.251 <sup>a</sup>	3	.084	.067	.977
Intercept	1250.591	1	1250.591	999.025	.000
Gender	.004	1	.004	.004	.953
Group	.016	1	.016	.013	.911
Gender * Group	.234	1	<b>.234</b>	<b>.187</b>	<b>.667</b>
Error	75.109	60	1.252		

Total	1491.000	64
Corrected Total	75.359	63

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a. R Squared = .003 (Adjusted R Squared = -.047)

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A two-way ANOVA was conducted to examine the effects of gender and group on students' interest scores. The results showed no significant main effect of gender,  $F(1, 60) = 0.004$ ,  $p = 0.953$ , and no significant main effect of group,  $F(1, 60) = 0.013$ ,  $p = 0.911$ . Similarly, the interaction between gender and group

was not significant,  $F(1, 60) = 0.187$ ,  $p = 0.667$ . Overall, the model did not explain a meaningful amount of variance in interest scores,  $R^2 = .003$ . This means that interest levels were essentially the same across males and females, control and experimental groups and there was no combined effect of gender and group

**Hypothesis 2:** There is no significant interaction effect of instructional package and gender on CRS students' academic achievements

Table 3: Descriptive statistics on the interaction effect of instructional package and gender on the posttest mean achievement scores of CRS students

Gender	Groups	Mean	Std. Deviation	N
Male	Pre Control	1.3333	.48507	18
	Pre Experimental	.8800	.52599	25
	Post Control	1.6500	.58714	22
	Post Experimental	1.8182	.58849	27
	<b>Total</b>	<b>1.4000</b>	<b>.65828</b>	<b>92</b>
Female	Pre Control	.6250	.71880	16
	Pre Experimental	.8333	.70711	18
	Post Control	1.5000	.52705	12
	Post Experimental	1.6667	.77850	16
	<b>Total</b>	<b>1.0714</b>	<b>.80582</b>	<b>62</b>

The descriptive statistics revealed that achievement scores were generally higher at posttest than at pre-

test for both control and experimental groups. At posttest, the experimental group ( $M = 1.76$ ) had a slightly higher mean achievement score than the

control group (M = 1.60), suggesting some benefit of the intervention. When comparing by gender, male students (M = 1.40) scored higher on achievement than female students (M = 1.07) overall. Both male and female students showed improvement from

pre-test to posttest, but the gains were larger among males. Within the posttest stage, both males and females in the experimental group scored higher than their counterparts in the control group, although the differences were modest.

Table 4: Two - way ANOVA on the Interaction Effect of Instructional Package and Gender on the Posttest Mean Achievement Scores of CRS Students

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	25.879 <sup>a</sup>	7	3.697	9.858	.000
Intercept	215.728	1	215.728	575.224	.000
Gender	2.267	1	2.267	6.045	.015
Groups	19.288	3	6.429	17.144	.000
Gender * Groups	2.351	3	<b>.784</b>	<b>2.090</b>	<b>.105</b>
Error	49.879	133	.375		
Total	303.000	141			
Corrected Total	75.759	140			

a. R Squared = .342 (Adjusted R Squared = .307)

### Discussion of Findings

The finding for the first research question revealed no significant interaction effect of instructional package and gender on students' posttest interest in CRS. This shows that male and female students

responded similarly to the multimedia in terms of interest. This finding supports Nkrumah et al. (2020), Yahaya (2015), and Atsuwe et al. (2019), who reported that multimedia fosters equal interest across genders in biology, social studies, and mechanics, respectively. Salihu et al. (2015) also found no gender-based differences in social studies interest

when multimedia was used. These studies confirm that multimedia resources are gender-friendly and inclusive. Theoretically, Mayer's Multimedia Learning Theory (2005) explains that both male and female learners possess the same dual-channel cognitive architecture, enabling them to benefit equally from multimedia input. Pekrun's control-value theory (2019) also notes that interest is shaped by perceptions of value and expectancy of success, which are not inherently gendered. Other studies reinforce this conclusion. Mesterjon et al. (2024) found that Quizizz increased interest for both genders without disparity, while Anaduaka et al. (2025) reported only marginal, non-significant variations in mathematics interest by gender. These findings collectively show that multimedia does not favor one gender over another. Therefore, the fifth finding suggests that multimedia instruction can be confidently adopted in CRS classrooms as an equitable strategy for stimulating interest in both male and female students.

The second finding revealed no significant interaction effect of instructional package and gender on

students' posttest achievement in CRS. Both male and female students achieved at comparable levels, indicating that multimedia did not privilege one gender over the other academically. This finding is supported by Yahaya (2015), Salihu et al. (2015), and Nkrumah et al. (2020), who reported no significant gender differences in achievement when multimedia was used in social studies, geography, and biology, respectively. Ado (2020) also found that multimedia improved mathematics performance for both male and female students equally. From a theoretical perspective, Outcome-Based Education (Reynolds et al., 2023) underscores that academic performance depends on structured instruction, not demographics like gender. Mayer (2015) also stressed that multimedia creates equal opportunities for deep learning because it engages universal cognitive processes. Though some studies (e.g., Anaduaka et al., 2025) reported slight female advantages in multimedia-supported mathematics, such differences were context-specific and inconsistent across subjects. CRS, being interpretative and moral in

focus, appears less influenced by gender differences in achievement. Thus, this finding confirms that multimedia is an equitable instructional approach in CRS classrooms, promoting fairness across genders.

## Conclusion

The study concludes that gender does not significantly influence the effectiveness of multimedia instruction on students' interest or academic achievement in Christian Religious Studies in Edo State. Multimedia

instruction, therefore, remains a viable strategy that benefits both male and female learners in CRS contexts.

## Recommendations

1. Teacher training should include gender-responsive multimedia instructional design.
2. Curriculum planners should integrate multimedia resources into CRS to promote inclusive learning.
3. Further research should examine teacher factors (competence, design quality) as possible moderators of gender effects in multimedia instruction

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