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Effect of Online Resources on Students' Academic Achievement and Retention in Financial Accounting in Colleges of Education in Abia State, Nigeria

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Abstract- This study investigated the effects of online resources, specifically YouTube and WhatsApp, on students' academic achievement and retention in Financial Accounting at Abia State College of Education (Technical), Arochukwu (ASCETA). The study adopted a quasi-experimental pre-test, post-test, and control group design. The population comprised all second-year students in the Department of Business Education (Accounting option), from which a sample of 90 students was drawn using purposive and simple random sampling techniques. Data were collected and analyzed using mean and standard deviation to answer the research questions, while Analysis of Covariance (ANCOVA) tested the hypotheses at a 0.05 level of significance. The findings revealed that both YouTube instructional videos and WhatsApp-mediated discussions significantly enhanced students' academic achievement compared to the conventional lecture method, with YouTube showing the strongest effect. YouTube also proved most effective for retention of Financial Accounting concepts, while WhatsApp facilitated collaborative learning and improved understanding. Gender was found to have no significant influence on achievement or retention, indicating that both male and female students benefited equally from these online resources. The study concluded that YouTube and WhatsApp have substantial potential to improve learning outcomes in Financial Accounting, with YouTube being most effective for both achievement and retention. Recommendations include integrating YouTube videos into instruction, using WhatsApp for collaborative discussion and revision, providing institutional support for digital learning, guiding students on responsible use of online resources, and conducting capacity-building workshops for lecturers.

Keywords: Online Resources, Youtube Instructional Videos, Whatsapp-Mediated Discussions, Academic Achievement, Retention, Financial Accounting.

I. INTRODUCTION

The 21st century has witnessed a remarkable shift in teaching and learning due to rapid advancements in Information and Communication Technology (ICT). Social media platforms such as YouTube and WhatsApp are increasingly becoming pedagogical tools, especially among students in higher institutions in Nigeria. YouTube, as a video-sharing platform, provides students with access to instructional videos, demonstrations, and tutorials that can enhance understanding of abstract concepts (Koko, 2022). WhatsApp, on the other hand, supports instant communication, collaborative learning, and information sharing through group discussions (Yusuf, Onasanya, & Adeniran, 2020). In Nigeria, studies (Mohammed & Ogar, 2023; Nwanaka, 2024) have reported positive effects of integrating YouTube and WhatsApp into instruction. However, despite these findings, there is limited empirical research on their effects in Colleges of Education, particularly in the teaching of Financial Accounting at Abia State College of Education (Technical), Arochukwu (ASCETA). Financial Accounting, being a core subject for Accounting Education students, requires not only mastery of principles but also retention for application in real-life business contexts. Many students at ASCETA record low performance in the subject (Iheonunekwu, 2021), which suggests the need for innovative instructional strategies beyond traditional lectures.

Abia State College of Education (Technical), Arochukwu (ASCETA), is a tertiary institution established to prepare teachers with strong pedagogical and technical competencies, particularly in vocational and business-related disciplines. As with many colleges of education in Nigeria, ASCETA operates within a rapidly changing educational environment influenced by advances in information and communication technology (ICT) and increased access to mobile internet services. These developments have expanded students' exposure to online learning resources, especially social media–based platforms such as YouTube and WhatsApp, which are now commonly used to support academic activities beyond the traditional classroom setting (Abia State College of Education, 2023).

Financial Accounting is a core subject in business education programmes and plays a critical role in developing students' analytical, numerical, and decision-making skills. The subject involves both conceptual understanding of accounting principles and mastery of procedural skills such as journal entries, ledger posting, preparation of trial balances, and final accounts. However, evidence from Nigerian colleges of education suggests that many students find Financial Accounting difficult due to its abstract concepts, cumulative nature, and the limited instructional time often available for practice and revision (Oladipo & Akinyemi, 2022). These challenges frequently result in poor academic achievement and weak retention of learned concepts.

The emergence of online resources has introduced new possibilities for improving teaching and learning outcomes in Financial Accounting. YouTube, as a video-sharing platform, provides access to a wide range of instructional videos, worked examples, and demonstrations that students can view repeatedly at their own pace. Research indicates that video-based learning can enhance students' understanding and academic achievement when the content is well structured and aligned with course objectives (Mayer, 2024; Zhang, 2025). For subjects like Financial Accounting, YouTube videos allow learners to pause, rewind, and replay explanations of accounting procedures, which may support deeper comprehension and long-term retention. Similarly, WhatsApp has gained prominence as an educational communication tool due to its ease of use, affordability, and interactive features. In many Nigerian tertiary institutions, WhatsApp groups are used to facilitate academic discussions, distribute learning materials, clarify difficult topics, and encourage peer collaboration. Studies have shown that WhatsApp-supported learning environments can improve students' academic performance, motivation, and retention by promoting continuous interaction between students and instructors outside the classroom (Adeyemi, 2023; Çetinkaya, 2025). The collaborative nature of WhatsApp learning aligns with social learning theory, which emphasizes the role of interaction and shared experiences in knowledge construction.

Despite the growing use of YouTube and WhatsApp among students, empirical evidence on their actual effects on academic achievement and retention in Financial Accounting particularly in colleges of education is still limited. Many existing studies focus on general academic performance or on other disciplines such as mathematics and science, with fewer investigations addressing accounting education in teacher-training institutions (Asanre et al., 2024). Moreover, several studies examine achievement without adequately considering retention, which is a crucial indicator of meaningful learning in cumulative subjects like Financial Accounting.

At ASCETA, anecdotal observations suggest that students increasingly rely on YouTube tutorials and WhatsApp study groups to complement classroom instruction. However, the extent to which these online resources contribute to improved academic achievement and sustained retention of accounting concepts has not been systematically examined. Without empirical evidence, instructors and administrators lack clear guidance on how best to integrate these platforms into teaching strategies to enhance learning outcomes. This study, therefore, seeks to investigate the effects of YouTube and WhatsApp on students' academic achievement and retention in Financial Accounting at ASCETA.

II. STATEMENT OF THE PROBLEM

Financial Accounting remains one of the most challenging courses for students in Colleges of Education across Nigeria, including Abia State College of Education (Technical), Arochukwu. Over the years, students' academic records, course assessments, and certification examination results at

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ASCETA have consistently shown poor achievement and weak retention of key Financial Accounting concepts. Many students struggle to understand abstract principles such as ledger posting, trial balance preparation, and final account drafting, leading to repeated failure, low confidence, and inability to apply concepts in real-life situations. One of the major educational problems contributing to this persistent underperformance is the continued reliance on traditional lecture methods, which are largely teacher-centred, note-dictation-driven, and insufficient for today's digital-native learners. Most ASCETA students already spend considerable time on social media platforms such as YouTube and WhatsApp, yet these technologies are rarely integrated into instructional delivery. As a result, a serious pedagogical gap exists: while students learn and socialize digitally, teaching and learning of Financial Accounting remain predominantly analog.
Despite the increasing popularity of social media platforms among Nigerian students, their potential as instructional tools has not been fully harnessed in Colleges of Education. Many lecturers at ASCETA still rely heavily on the conventional lecture method, which often limits students' engagement and long-term retention of knowledge. This has contributed to persistent cases of low achievement in Financial Accounting, as reflected in examination results and feedback from course lecturers.

Although studies in other contexts (Asanre, 2024; Atah & Egbe, 2022) suggest that YouTube and WhatsApp can improve learning outcomes, empirical evidence specific to ASCETA is lacking. Without such localized studies, lecturers and policymakers may be reluctant to adopt these platforms in formal teaching. The problem of poor achievement and retention in Financial Accounting at ASCETA, therefore, necessitates an investigation into the effectiveness of YouTube and WhatsApp as alternative instructional strategies.

Existing studies from Nigeria and beyond suggest that platforms such as YouTube and WhatsApp can significantly enhance comprehension, participation, and long-term retention. However, no empirical evidence currently exists on how these tools affect Accounting Education students at ASCETA. Without localized evidence, lecturers lack the justification to adopt these platforms, and the institution lacks data to support ICT-based instructional reforms.

Therefore, the major educational problem is the continuous cycle of poor achievement and low retention in Financial Accounting at ASCETA, driven by ineffective teaching methods, underuse of digital tools already familiar to students, and absence of empirical evidence to guide ICT-integrated pedagogical decisions. This problem calls for urgent investigation to determine whether YouTube and WhatsApp can provide meaningful improvement.

III. PURPOSE OF THE STUDY

The general purpose of this study was to investigate the effects of online resources on students' academic achievement and retention in Financial Accounting at ASCETA. Specifically, the study sought to:

1. Determine the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions, and lecture method.
2. Ascertain the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method.
3. Determine the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos.
4. Determine the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions.
5. Ascertain the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos.
6. Ascertain the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos and Whatsapp-mediated discussions.

IV. RESEARCH QUESTIONS

The following research questions guided the study:

1. What are the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions, and lecture method?
2. What are the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method?
3. What are the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos?
4. What are the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions?
5. What are the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos?
6. What are the mean retention scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions?

V. HYPOTHESES

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

Ho_1: There is no significant difference in the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method.

Ho_2: There is no significant difference in the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method.

Ho_3: There is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos.

Ho4: There is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions.

Ho5: There is no significant difference in the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos.

Ho6: There is no significant difference in the mean retention scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions.

VI. METHODOLOGY

The study adopted quasi-experimental research design, specifically the pre-test, post-test, and control group design. In this study, experimental groups were exposed to instructional content delivered through YouTube and WhatsApp respectively, while the control group received conventional classroom teaching without the use of these digital platforms. The study was carried out at the Abia State College of Education (Technical), Arochukwu, located in Arochukwu Local Government Area of Abia State, Nigeria. The population of the study consisted of 120 students comprising 46 male and 74 female second-year students in the Department of Business Education (Accounting option) at Abia State College of Education (Technical), Arochukwu, in the 2024/2025 academic session. A sample of 90 students was drawn from the population using the purposive and simple random sampling techniques. Purposive sampling was used to select students from the Accounting option, while random sampling was employed to assign participants into three groups of 30 students each. The Financial Accounting Achievement Test (FAAT) and Financial Accounting Retention Test (FART) were used for data collection. The tests were used to measure students' knowledge and performance in selected topics in Financial Accounting. The instrument was validated by two experts from the Business Education unit in the Department of Agricultural and Vocational Education

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and one expert from the Measurement and Evaluation unit in the department of Science Education all in Michael Okpara University of Agriculture, Umudike Abia State. The reliability of the instrument was established through a pilot test conducted with 30 students in Abia State University Uturu. The data obtained were analyzed using the Kuder-Richardson formula 20 (KR-20), which yielded a reliability coefficient of 0.76. Data were collected by administering the test in three phases; Pre-test scores before the intervention; Post-test scores immediately after the intervention; and Retention test scores four weeks later. Mean and standard deviation were used to answer the research questions regarding achievement and retention while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. This implied that any p-value that is less than 0.05 is significant and therefore the null hypothesis is rejected and subjected to post hoc analysis to determine the direction of significance. On the other hand, any p-value that is equal to or greater than 0.05 is not significant and the hypothesis is not rejected. The data analysis was computed with a computer software programme; statistical package for the social sciences (SPSS).

VII. RESULTS

Research Question 1
What are the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions, and lecture method?

Table 1: Mean Achievement Scores of Students Taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions, and Lecture Method

Method	N	Pretest		Post-test		Mean
		Mean	SD	Mean	SD	Diff.
Youtube	30	39.50	12.41	84.83	5.645	45.33
Whatsapp	30	37.17	13.50	75.67	7.626	38.50
Lecture method	30	38.83	14.12	61.00	9.135	22.17

Data in table 1 shows some descriptive indicators of students' performance at two stages (Pretest and Post-test) for the YouTube, WhatsApp, and Lecture teaching groups. At the pre-test stage, the mean scores were relatively similar across groups (YouTube = 39.50, WhatsApp = 37.17, Lecture = 38.83), indicating that the students started the experiment with comparable prior knowledge in Financial Accounting. This suggests that any subsequent differences in achievement are unlikely to be due to initial disparities in ability. After the instructional intervention, clear performance differences emerged. Students taught with YouTube achieved the highest post-test scores (M = 84.83, SD = 5.65), followed by those taught via WhatsApp (M = 75.67, SD = 7.63). The Lecture group recorded the lowest achievement (M = 61.00, SD = 9.14). This pattern indicates that YouTube-based instruction was the most effective in improving students' academic achievement based on the correct scores of respondents.

Hypothesis 1
There is no significant difference in the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method.

Table 2: Analysis of Covariance of the Mean Achievement Scores of Students Taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method and Lecture Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2896.911[a]	3	965.637	7.688	.000
Intercept	21622.840	1	21622.861	172.178	.000

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Pretest	12.535	1	12.535	.100	.753
Learning Method	2896.636	2	1448.317	11.532	.000
Error	13939.813	87	125.583		
Total	333644.000	90			
Corrected Total	16831.730	89			

The result in Table 2 shows that there is a significant difference in the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method with p-value of 0.000 at 0.05 level of significance. Thus, the null hypothesis which states that there is no significant difference in the mean achievement scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method is rejected.

Research Question 2
What are the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method?

Table 3: The Mean Retention Scores of Students Taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture methods

		Post-test		Retention scores		
Method	N	Mean	SD	Mean	SD Diff.	Mean
Youtube	30	56.85	10.53	58.62	12.67	11.55
Whatsapp	30	53.10	8.28	64.65	2.04	9.25
Lecture method	30	44.81	14.20	54.06	14.86	1.77

Table 3 shows that students taught Financial Accounting with Youtube videos had a retention mean score of 58.62 with standard deviation of 12.67 and mean difference of 11.55, students taught with Whatsapp-mediated discussions had a retention mean score of 64.65 with standard deviation of 2.04 and mean difference of 9.25 while those taught with lecture method had retention mean score of 54.06 with standard deviation of 14.86 and mean difference of 1.77. Again, the scores are widely spread in the three groups since the standard deviation values are far from the mean. The result indicates that the students taught with Youtube Instructional videos with mean difference of 11.55 had the highest retention followed by those taught using Whatsapp-mediated discussions with mean difference of 9.25 while those taught with lecture method had the least retention with the mean difference of 1.77.

Hypothesis 2
There is no significant difference in the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method.

Table 4: Analysis of Covariance of the Mean Retention Scores of Students Taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	2745.003[a]	3	915.000	5.516	.001
Intercept	20304.342	1	20304.342	122.421	.000
Pretest	969.362	1	969.360	5.844	.017
Learning Method	1666.005	2	833.001	5.021	.008
Error	18409.917	87	165.853		
Total	421115.000	90			
Corrected Total	21153.922	89			

Data in Table 4 reveals that there is a significant difference in the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method with p-value of 0.008 at 0.05

level of significance. Therefore, the null hypothesis which states that there is no significant difference in the mean retention scores of students taught Financial Accounting using YouTube instructional videos, Whatsapp-mediated discussions and lecture method is rejected.

Research Question 3
What are the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos?

Table 5: Mean Achievement Scores of Male and Female students taught Financial Accounting using YouTube instructional videos

		Pretest		Post-test		Mean
YouTube instructional videos	N	Mean	SD	Mean	SD	Diff.
Male	17	30.47	9.93	55.32	10.81	24.85
Female	13	29.42	8.53	58.21	10.22	28.75

Table 5 shows that male students taught using Youtube instructional videos had pre-test mean of 30.47 with standard deviation of 9.93, post-test mean of 55.32 with standard deviation of 10.81 and mean difference of 24.85. Their female counterparts had a pre-test mean of 29.42 with standard deviation of 8.53, post-test mean of 58.21 with standard deviation of 10.22 and mean difference of 28.75. The standard deviation values are still far from the mean, thus showing that the scores are widely spread in the two groups. The mean differences of 24.85 and 28.75 for the male and female students respectively show that learning has taken place. The higher mean difference of 28.81 obtained by the female students indicates that they achieved higher than the male students with mean difference of 24.85 when taught Financial Accounting taught using Youtube instructional videos.

Hypothesis 3
There is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos.

Table 6: Analysis of Covariance of the Mean Achievement Scores of Male and Female Students Taught Financial Accounting using YouTube instructional videos

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1121.956[a]	2	560.978	6.070	.004
Intercept	7733.459	1	7733.459	83.673	.000
Pretest	1015.613	1	1015.613	10.989	.002
Gender	148.316	1	148.316	1.605	.211
Error	4528.813	27	92.425		
Total	173688.000	30			
Corrected Total	5650.769	29			

Data in Table 6 shows that there is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos with p-value of 0.21 at 0.05 level of significance. Thus, the null hypothesis which states that there is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using YouTube instructional videos is not rejected.

Research Question 4
What are the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions?

Table 7: The Mean Achievement Scores of Male and Female students taught Financial Accounting using Whatsapp-mediated discussions

		Pretest		Post-test		Mean
Whatsapp Mediated Discussion	N	Mean	SD	Mean	SD	Diff.
Male	17	32.81	7.59	56.00	5.56	23.13
Female	13	31.31	8.97	50.00	9.68	18.67

Table 7 shows that male students taught Financial Accounting using Whatsapp-mediated discussions had pre-test mean score of 32.81 with standard deviation of 7.59, post-test mean score of 56.00 with standard deviation of 5.56 and mean difference of 23.13. The female students had pre-test mean score of 31.31 with standard deviation of 8.97, post-test mean of 50.00 with standard deviation of 9.68 and mean difference of 18.67. This shows that the scores are widely spread in the two groups since the standard deviation values are far from the mean. The mean differences of 23.13 and 18.67 for the males and females respectively indicate that what they were taught has been acquired. The result shows that the male students had higher achievement than their female counterparts when taught Financial Accounting using Whatsapp-mediated discussions.

Hypothesis 4
There is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions.

Table 8: Analysis of Covariance of the Mean Achievement Scores of Male and Female Students Taught Financial Accounting using Whatsapp-mediated discussions

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	511.179[a]	2	255.589	4.636	.018
Intercept	7435.329	1	7435.329	134.879	.000
Pretest	232.469	1	232.469	4.217	.049
Gender	326.801	1	326.801	5.928	.022
Error	1543.531	27	55.126		
Total	89452.000	30			
Corrected Total	2054.710	29			

Data in Table 8 show that there is significant difference in the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions at 0.05 level of significance (p-value = 0.02 which is less than 0.05). Thus, the null hypothesis which states that there is no significant difference in the mean achievement scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions is rejected.

Research Question 5
What are the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos?

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Table 9: The Mean Retention Scores of Male and Female students taught Financial Accounting using YouTube instructional videos

Youtube Instructional Videos	N	Post-Test		Retention Test		Mean
		Mean	SD	Mean	SD	Diff.
Male	17	55.36	10.83	61.25	12.24	5.81
Female	13	58.22	10.25	56.33	12.47	-2.04

Table 9 shows that male students taught Financial Accounting using YouTube instructional videos had a mean retention score of 61.25 with standard deviation of 12.24 and mean difference of 5.81 while their female counterparts had mean retention score of 56.33 with standard deviation of 12.47 and mean difference of -2.04. The result shows that the male students with mean difference of 5.81 retained higher than their female counterparts with mean difference of -2.04 when taught Financial Accounting using YouTube instructional videos.

Hypothesis 5
There is no significant difference in the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos.

Table 10: Analysis of Covariance of the Mean Retention Scores of Male and Female Students Taught Financial Accounting using YouTube instructional videos.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1310.908[a]	2	655.454	4.670	.014
Intercept	8585.537	1	8585.537	61.170	.000
Pretest	969.048	1	969.048	6.904	.011
Gender	276.109	1	276.109	1.967	.167
Error	6877.399	27	140.355		
Total	186848.000	30			
Corrected Total	8188.308	29			

Table 10 indicates that there is no significant difference in the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos with p-value of 0.17 at 0.05 level of significance. Therefore, the null hypothesis which states that there is no significant difference in the mean retention scores of male and female students taught Financial Accounting using YouTube instructional videos is not rejected.

Research Question 6
What are the mean retention scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions?

Table 11: The Mean Retention Scores of Male and Female students taught Financial Accounting using Whatsapp-mediated discussions

Whatsapp-mediated discussions	N	Post-Test		Retention Test		Mean
		Mean	SD	Mean	SD	Diff.
Male	17	56.00	5.56	66.71	11.38	10.71
Female	13	50.00	9.68	62.35	12.45	12.35

Table 11 shows that male students taught Financial Accounting using Whatsapp-mediated discussions

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had retention mean score of 66.71 with standard deviation of 11.38 and mean difference of 10.71

while the female students had retention mean score of 62.35 with standard deviation of 12.45 and mean difference of 12.35. The mean difference of 12.35 for the female students shows that they retained what was taught higher than the male students who had 10.71 mean difference when taught Financial Accounting using Whatsapp-mediated discussions.

Hypothesis 6
There is no significant difference in the mean retention scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions.

Table 12: Analysis of Covariance of the Mean Retention Scores of Male and Female Students Taught Financial Accounting using Whatsapp-mediated discussions

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	189.804[a]	2	94.902	.639	.535
Intercept	6504.700	1	6504.700	43.810	.000
Pretest	43.308	1	43.308	.292	.593
Gender	130.369	1	130.369	.878	.357
Error	4157.292	27	148.475		
Total	133896.000	30			
Corrected Total	4347.097	29			

Table 12 reveals that there is no significant difference in the mean retention scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions with p-value of 0.36 at 0.05 significant level. Thus, the null hypothesis which states that there is no significant difference in the mean retention scores of male and female students taught Financial Accounting using Whatsapp-mediated discussions is not rejected.

VIII. DISCUSSION OF FINDINGS

The findings of this study revealed that students taught using YouTube instructional videos achieved significantly higher post-test scores than those taught through WhatsApp-mediated discussions and the lecture method. This outcome highlights the pedagogical strength of video-based instruction in facilitating conceptual understanding. The superior performance of the YouTube group may be attributed to the multimodal nature of video learning, which integrates visual demonstration, auditory explanation, and procedural modelling. This aligns with Mayer's Cognitive Theory of Multimedia Learning, which posits that learners process information more effectively when presented through dual channels (Mayer, 2024). The finding also aligns with those of Koko (2022), Mohammed & Ogar (2023) and Zhang (2025) who found that YouTube enhances academic achievement by improving clarity of explanations and enabling repeated exposure to learning content.

In Financial Accounting, where procedural accuracy and conceptual precision are essential, the ability to pause, rewind, and replay instructional videos likely strengthened students' mastery of accounting operations.

The study further established a significant difference in retention scores among the instructional groups. Students exposed to YouTube and Whatsapp demonstrated stronger retention than those taught via the lecture method. This suggests that online resources not only improve immediate achievement but also promote long-term knowledge consolidation. The enhanced retention associated with YouTube may be linked to deeper cognitive processing stimulated by visualised demonstrations, while Whatsapp-mediated discussions may have supported retention through collaborative reinforcement. These findings are consistent with those of Adeyemi (2023) and Çetinkaya (2025) which emphasise that learning is strengthened through interaction, reflection, and active engagement.

With respect to gender, the findings revealed no significant difference in achievement between male and female students taught using YouTube instructional videos. This implies that video-based learning environments may provide equitable cognitive benefits across gender categories. The structured and self-paced nature of YouTube instruction possibly minimized gender-related disparities by allowing individualized learning control. This observation is in line with the findings of Yusuf et al. (2020), and Nwanaka (2024) who noted that technology-mediated instruction often neutralizes traditional gender gaps in academic performance. The finding reinforces the argument that instructional design, rather than gender, plays a more decisive role in determining learning outcomes. However, a contrasting pattern emerged in Whatsapp-mediated discussions, where a significant gender difference in achievement was observed. Male students recorded higher achievement scores than their female counterparts. This difference may be associated with variations in participation dynamics, communication confidence, or engagement intensity within collaborative digital spaces. The finding also aligns with that of Çetinkaya (2025) who opined that interaction-driven platforms may sometimes reflect social behaviour patterns that influence learning contributions. Nevertheless, despite the statistical difference, both gender groups demonstrated meaningful learning gains, indicating that Whatsapp remains instructionally beneficial.

Furthermore, no significant gender differences were observed in retention scores for both YouTube and Whatsapp groups. This suggests that although short-term performance variations may occur, long-term knowledge retention appears largely gender-independent. The finding is consistent with that of Mayer (2024) who asserted that retention is more strongly influenced by cognitive engagement and reinforcement strategies than by demographic variables. Overall, the findings of this study strongly validate the instructional effectiveness of online resources in Financial Accounting. The consistent superiority of YouTube-supported learning, coupled with the collaborative benefits of Whatsapp-mediated discussions, indicates that digital pedagogical tools can significantly enhance both academic achievement and retention. Hence, reliance on the lecture method alone may no longer be sufficient for optimising learning outcomes in cognitively demanding subjects such as Financial Accounting. Technology-enhanced instruction appears not merely supplementary but pedagogically transformative.

IX. CONCLUSION

This study examined the effects of online resources on students' academic achievement and retention in Financial Accounting at Abia State College of Education (Technical), Arochukwu. The findings revealed that technology-supported instructional strategies significantly improve learning outcomes. Students taught using YouTube instructional videos achieved the highest academic performance, followed by those exposed to WhatsApp-mediated discussions, while the lecture method produced the lowest achievement scores. The study further established that online resources enhance knowledge retention. Students exposed to digital learning platforms demonstrated stronger retention than those taught through the conventional lecture method, indicating that multimedia and interactive learning environments promote deeper understanding and longer-lasting learning. With respect to gender, no significant differences were observed in achievement and retention among students taught using YouTube, suggesting that multimedia-based instruction provides equitable learning benefits. Although some variation emerged within WhatsApp-mediated discussions, retention outcomes remained comparable. Therefore, the study concludes that online instructional resources, especially YouTube and WhatsApp, are effective pedagogical tools for improving academic achievement and retention in Financial Accounting.

X. RECOMMENDATIONS

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

1. Lecturers should integrate YouTube instructional videos into Financial Accounting instruction to enhance conceptual

understanding, procedural clarity, and learner engagement.

2. Lecturers should adopt WhatsApp-mediated discussions as a complementary instructional strategy to promote collaborative learning, academic interaction, continuous feedback, and reinforcement of classroom instruction.
3. Institutions should organise capacity-building programmes on digital pedagogy for lecturers which focus on multimedia instructional design, digital classroom management, and technology-enhanced teaching strategies.
4. Educational administrators should provide infrastructural and policy support for technology-enhanced learning such as improving internet accessibility, providing digital learning facilities, and establish clear guidelines for ICT-integrated instruction to ensure effective implementation.
5. Curriculum planners should incorporate digital instructional strategies into Financial Accounting pedagogy.
6. Students should be sensitised on the academic use of online learning resources through academic orientation programmes to encourage structured, responsible, and educationally purposeful use of platforms such as YouTube and WhatsApp.

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