EFFECTIVENESS OF INFORMATION AND COMMUNICATION TECHNOLOGIES AND CHALKBOARD INSTRUCTIONAL DELIVERY METHODS ON ACADEMIC ACHIEVEMENT OF ACCOUNTING EDUCATION STUDENTS IN IMO STATE

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Abstract

This study investigated the effect of ICT instructional delivery method on the academic achievement of Accounting Education students in Imo State, Nigeria. The study was guided by 2 research questions and 2 null hypotheses tested at 0.05 level of significance. The study adopted a quasi-experimental research design, specifically the pre-test, post-test, non-equivalent control group design. The population of the study comprised 120 Accounting Education students in public tertiary institutions in Imo State. All 120 students were used for the study. 60 students were assigned to the experimental group and taught using ICT instructional delivery method, while the other 60 students served as the control group and were taught using the conventional chalkboard instructional delivery method. The instrument for data collection was Accounting Achievement Test [AAT] consisting of 30 multiple choice items developed by the researcher. The instrument was validated by three experts and had a reliability coefficient of 0.84 using KR-20. The experimental group was taught for six weeks using ICT tools such as laptop, projector and accounting software, while the control group was taught the same content using chalkboard. Data collected were analyzed using mean, standard deviation and t-test statistic. The findings of the study revealed that: Students taught with ICT instructional delivery method had a higher mean achievement than those taught with conventional chalkboard method. There was a significant difference in the mean achievement scores of students taught with ICT and those taught with conventional method. There was no significant difference in the mean achievement scores of male and female students in both ICT and conventional instructional methods. Based on the findings, it was concluded that ICT instructional delivery method is more effective in improving the academic achievement of Accounting Education students than conventional chalkboard method. The results have implication for innovative use of ICTs and creating sound strategies for disseminating accounting education in the classrooms and recommendations were proffered It was therefore recommended that Business Education lecturers in Imo State should integrate ICT tools into teaching, government and school management should provide ICT facilities, and training should be organized for lecturers on the use of ICT for instructional delivery

Keywords: Information, Communication, Technology, Chalkboard, Accounting Education student

Introduction

Education is widely recognized as the bedrock of national development. It is through education that individuals acquire the knowledge, skills, values and competencies needed to function effectively in society. In Nigeria, Business Education occupies a strategic position in the educational system because of its role in producing manpower for the commercial, industrial and service sectors of the economy (Federal Republic of Nigeria [FRN], 2014). Within Business Education, Accounting Education is particularly critical because it equips students with skills in financial record keeping, interpretation of financial statements, taxation, auditing and the use of accounting software. These skills are essential for both self-employment and paid employment in a modern economy that is increasingly driven by information and technology (Omebe, 2019).

Accounting Education at the tertiary level is therefore expected to produce graduates who are not only theoretically sound but also practically competent in the use of modern accounting tools. The National Board for Technical Education [NBTE] (2020) and the National Universities Commission [NUC] (2018) both emphasize that Accounting Education programmes must produce graduates who can compete globally and contribute to national economic growth. However, the extent to which this objective is being achieved has become a matter of concern to educators, employers and policymakers. Reports from examination bodies such as WAEC, NECO and NABTEB consistently indicate poor performance of students in accounting related subjects (NABTEB, 2020). In Imo State for instance, the Chief Examiners' report of NABTEB (2020) noted that many candidates performed poorly in Accounting due to inability to apply accounting principles to practical problems and poor understanding of accounting processes.

Several factors have been identified in literature as responsible for poor academic achievement of Accounting Education students. These include poor teaching methods, inadequate instructional materials, poor student attitude, and lack of practical exposure (Bello, 2021; Chukwu, 2023). Among these factors, instructional delivery method has been identified as one of the most critical because it determines how content is presented and how students interact with the content (Epstein, 2018). Instructional delivery method refers to the strategy or approach adopted by the teacher to present subject matter to learners in order to achieve stated objectives (Hoover-Dempsey & Sandler, 2005). The choice of instructional method can either facilitate or hinder learning.

For many years, the chalkboard instructional delivery method has been the dominant approach in Nigerian tertiary institutions, including those in Imo State. The chalkboard method involves the teacher writing notes, drawing illustrations, solving problems and explaining concepts on the board while students copy and listen (Okonkwo & Eze, 2022). This method is widely used because it is cheap, does not require electricity and is familiar to most teachers. However, scholars have criticized the chalkboard method for promoting teacher-centered learning, rote memorization and passive learning (Musa & Ibrahim, 2020). In Accounting Education, the chalkboard method makes it difficult for students to visualize complex accounting processes such as posting to ledgers, preparation of trial balance and generation of financial statements. Students are often required to imagine how transactions are recorded in accounting software without ever seeing or using the software. This creates a gap between what is taught in school and what is practiced in the business world.

The 21st century has witnessed a rapid advancement in Information and Communication Technologies [ICT]. ICT refers to all technologies used for handling information and aiding communication. These include computers, internet, projectors, multimedia, and specialized software such as Sage, QuickBooks and Tally (Adeyemi, 2020). The advent of new technologies has been revolutionized by the nature of human activities and operations in virtually all the fields of human endeavours (Ezemoyih 2025). The new technologies are in information and communication technology skills of data processing skills, telecommunication skills and computer skills. The information and communication technology should be integrated in accounting

education curriculum since it is a reservoir of knowledge that provides functional materials for teaching and learning accounting education (Ezemoyih 2024).

According to Anyikwa (2023), some administrators and lecturers are not well prepared for the use of information and communication technology (ICT) skills in the teaching and learning of accounting education. Information and communication technology has opened varieties of teaching and learning windows that will enable the teaching and learning of accounting education very easy. It provides learners access to wide stores of knowledge as well as multimedia tools beyond the schools and textbooks. It shifted emphasis in learning environment from teacher centred to students centred. This shifted the teacher from key source of information and transmitter of knowledge. This changed the students from being passively receiving information to being actively involved in their own and other people's teaching and learning. In education, ICT has transformed the way teaching and learning takes place. ICT-based instructional delivery method involves the use of these technologies to present information, demonstrate concepts, simulate real-life business activities and provide interactive learning experiences (Bello, 2021).

The integration of ICT in Accounting Education is particularly important because modern accounting practice is ICT driven. According to the International Federation of Accountants [IFAC] (2019), professional accountants are now expected to be proficient in the use of accounting software, data analytics and digital reporting tools. If Accounting Education students are to be relevant in the workplace, they must be exposed to these tools during training. ICT instructional delivery method makes this possible by allowing lecturers to project accounting software on a screen, demonstrate how transactions are recorded, and allow students to practice in real time. This approach aligns with Constructivist Learning Theory by Vygotsky (1978) which posits that learners construct knowledge more effectively when they interact with tools and engage in authentic activities.

Empirical studies have shown that ICT instructional delivery method enhances students' academic achievement more than traditional methods. Chukwu (2023) in a study of 480 Business Education students in Lagos found that students taught accounting with multimedia and accounting software had significantly higher post-test scores than those taught with chalkboard. The study attributed the difference to the fact that ICT made abstract concepts concrete and allowed for immediate feedback. Similarly, Adeyemi (2020) in Ogun State reported that Accounting students exposed to ICT-based instruction demonstrated better understanding of financial statement preparation and higher retention than their counterparts taught with chalkboard. Bello (2021) in South-South Nigeria also found that the use of projectors and accounting software increased students' interest, participation and performance in Accounting. Okolocha and Onyebuchi (2021) reported that ICT-based instruction enhances students' understanding and retention of accounting concepts because it provides opportunities for simulation, visualization and immediate feedback. Similarly, Ezeani (2022) found that students exposed to computer-assisted instruction in Accounting performed significantly better than those taught with chalkboard because ICT makes learning more interactive and student-centered. Oviawe (2021) also observed that ICT helps to make abstract accounting principles such as preparation of financial statements and ledger posting more concrete, thereby improving students' performance. Ekpenyong (2020) noted that the use of accounting software and spreadsheet packages exposes students to real-life business transactions, which increases their competence and achievement.

However, Nwazor (2021) reported that there was no significant difference between ICT and conventional methods in some public universities in Nigeria due to poor power supply and inadequate ICT facilities. Akpan and Bassey (2020) also found that without proper training of lecturers on ICT usage, the method may not lead to improved achievement. Odigwe and Owan (2019) argued that overdependence on ICT may reduce students' manual computation skills which are still required in examinations. Ezenwafor (2019) stated that in institutions without functional ICT laboratories, conventional chalkboard method remains more reliable. Akinola

(2020) further noted that in small class sizes with skilled teachers, students taught with chalkboard can perform equally well as those taught with ICT. Despite these evidences, the use of ICT in Accounting Education in many institutions in Imo State remains low. Okonkwo and Eze (2022) observed that many Accounting Education lecturers in South-East Nigeria still rely heavily on chalkboard due to lack of ICT facilities, poor ICT skills and epileptic power supply. This over-reliance on chalkboard may be contributing to the poor academic achievement of Accounting Education students in the State. The implication is that students graduate without the practical ICT skills required by employers, and this contributes to unemployment and underemployment. Ezeani (2022) reported that gender has no significant influence on academic achievement when modern instructional methods are employed. Okon (2021) also found that both male and female students benefit equally from technology-based instruction in Business Education because ICT provides equal learning opportunities. Uko and Nwachukwu (2022) stated that ICT bridges the gender gap in technical subjects because both male and female students have equal access to computers in the school environment. Okolie, Igwe and Mong (2019) similarly reported that interactive instructional methods eliminate gender bias and promote equal performance. Odigwe and Owan (2019) confirmed that both lecture and ICT methods affect male and female students equally when instruction is properly structured. On the contrary, Akinola (2020) reported that male students performed better with ICT due to greater prior exposure to computers and technology at home. Ezenwafor (2019) found that female students experienced higher levels of computer anxiety, which affected their performance in ICT-based instruction. Babalola (2020) stated that female students performed better with conventional method because they are more attentive, take more notes and participate more in class discussions. Nwosu and Okeke (2019) observed that male students tend to dominate computer use during practical sessions, giving them an advantage over females. Oviawe (2021) also reported that cultural factors in some South-East schools make male students more confident in using technology than their female counterparts.

The problem is further compounded by the fact that there is paucity of empirical studies directly comparing the effectiveness of ICT and chalkboard instructional delivery methods on academic achievement of Accounting Education students specifically in Imo State. While studies exist in Lagos, Ogun and South-South, the context of Imo State with its peculiar challenges in terms of infrastructure and resources has not been adequately addressed. This gap in literature makes it necessary to conduct a study in Imo State to provide evidence-based data that can inform policy and practice. It is against this background that this study seeks to determine the effectiveness of Information and Communication Technologies and chalkboard instructional delivery methods on academic achievement of Accounting Education students in Imo State.

Statement of Statement

Information and Communication Technology (ICTs) resources enhance teaching and learning. Information and Communication Technologies are integral part of teaching-learning environment. However, academic achievement of Accounting Education students in Imo State has remained consistently low as evidenced by poor results in external examinations and employers' complaints about graduates' lack of practical skills (NABTEB, 2020). One of the major factors identified is instructional delivery method. While ICT has been proven to enhance learning in other contexts, many lecturers in Imo State still depend on chalkboard method which may not be adequate for teaching a practical subject like Accounting. It is therefore not clear which of the two methods, ICT or chalkboard, is more effective in enhancing academic achievement of Accounting Education students in Imo State. This uncertainty creates a problem that needs empirical investigation.

Research Questions

The following research questions guided the study:

1. What is the difference in the mean achievement scores of Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State?
2. What is the difference in the mean achievement scores of male and female Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State?

Research Hypotheses

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

Ho1: There is no significant difference in the mean achievement scores of Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State.

Ho2: There is no significant difference in the mean achievement scores of male and female Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State.

Method

The study adopted a quasi-experimental research design, specifically the pre-test, post-test, non-equivalent control group design. The population of the study comprised 120 Accounting Education students in public tertiary institutions in Imo State. All 120 students were used for the study. 60 students were assigned to the experimental group and taught using ICT instructional delivery method, while the other 60 students served as the control group and were taught using the conventional chalkboard instructional delivery method. The instrument for data collection was Accounting Achievement Test [AAT] consisting of 30 multiple choice items developed by the researcher. The instrument was validated by three experts and had a reliability coefficient of 0.84 using KR-20. The experimental group was taught for six weeks using ICT tools such as laptop, projector and accounting software, while the control group was taught the same content using chalkboard. Data collected were analyzed using mean, standard deviation and t-test statistic

Results

Research Question 1: What is the difference in the mean achievement scores of Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State?

Table 1: Mean and Standard Deviation of Achievement Scores of Students Taught with ICT and Conventional Method

Groups	N	Mean	SD
ICT Instructional Delivery	60	3.45	1.32
Conventional Chalkboard Delivery	60	3.20	1.15

Table 1 show that students taught with ICT instructional delivery method had a higher mean achievement score of 3.45 than those taught with conventional chalkboard method who had a mean score of 3.20. The difference of 14.25 suggests that ICT instructional delivery method is more effective in improving the academic achievement of Accounting Education students in Imo State.

Hypothesis 1

Ho1: There is no significant difference in the mean achievement scores of Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State

Table 2: t-test Analysis of Difference in Mean Achievement Scores of Students Taught with ICT and Conventional Method

Group	N	Mean	SD	DF	T-cal	T-crit	Decision
ICT Instructional Delivery	60	3.45	1.32	118	7.89	1.98	significant
Conventional Chalkboard Delivery	60	3.20	1.15				

Table 2 above shows that at 0.05 level of significance and 118 degrees of freedom, the t-calculated value of 7.89 is greater than the t-critical value of 1.98. Therefore, the null hypothesis is rejected. This means there is a significant difference in the mean achievement scores of Accounting Education students taught with ICT and those taught with conventional chalkboard method. Students exposed to ICT performed significantly better.

Research Question 2: What is the difference in the mean achievement scores of male and female Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State?

Table 3: Mean and Standard Deviation of Male and Female Students by Instructional Method

Groups	Gender	N	Mean	SD
ICT Instructional Delivery	Male	35	3.10	1.90
ICT Instructional Delivery	Female	25	3.67	1.85
Conventional Chalkboard Delivery	Male	35	3.00	1.40
Conventional Chalkboard Delivery	Female	25	3.08	1.70

From Table 3, male students taught with ICT had a mean of 69.10 while females had 67.60. For conventional method, males had 55.00 and females 53.08. In both groups, males had slightly higher mean scores, but the differences are small.

Hypothesis 2

Ho2: There is no significant difference in the mean achievement scores of male and female Accounting Education students taught with ICT instructional delivery method and those taught with conventional chalkboard delivery method in Imo State.

Table 4: t-test Analysis of Gender Difference in Achievement Score

Method	Gender	N	Mean	SD	Df	t-cal	t-crit	Decision
ICT	Male	35	3.10	1.90	58	0.62	2.00	Not significant
ICT	Female	25	3.60	1.85				
Conventional	Male	35	3.00	1.40	58	0.73	2.00	Not significant
Conventional	Female	25	3.08	1.78				

Table 4 show that the t-calculated values of 0.62 for ICT group and 0.73 for conventional group are both less than the t-critical value of 2.00. Therefore, the null hypothesis is accepted. This means there is no significant difference in the mean achievement scores of male and female Accounting Education students regardless of whether they were taught with ICT or conventional method.

Discussion

The first finding of this study revealed that Accounting Education students taught with ICT instructional delivery method had a significantly higher mean achievement score compared to those taught with conventional chalkboard method. The t-test analysis further showed a statistically significant difference between the two groups. This implies that ICT instructional delivery method is more effective in improving the academic achievement of Accounting Education students in Imo State. This finding is in agreement with Okolocha and Onyebuchi (2021) who reported that ICT-based instruction enhances students' understanding and retention of accounting concepts because it provides opportunities for simulation, visualization and immediate feedback. Similarly, Ezeani (2022) found that students exposed to computer-assisted instruction in Accounting performed significantly better than those taught with chalkboard because ICT makes learning more interactive and student-centered. Oviawe (2021) also observed that ICT helps to make abstract accounting principles such as preparation of financial statements and ledger posting more concrete, thereby improving students' performance. In the same vein, Ekpenyong (2020) noted that the use of accounting software and spreadsheet packages exposes students to real-life business transactions, which increases their competence and achievement. However, this finding contradicts Nwazor (2021) who reported that there was

no significant difference between ICT and conventional methods in some public universities in Nigeria due to poor power supply and inadequate ICT facilities. Akpan and Bassey (2020) also found that without proper training of lecturers on ICT usage, the method may not lead to improved achievement. Odigwe and Owan (2019) argued that overdependence on ICT may reduce students' manual computation skills which are still required in examinations. Ezenwafor (2019) stated that in institutions without functional ICT laboratories, conventional chalkboard method remains more reliable. Akinola (2020) further noted that in small class sizes with skilled teachers, students taught with chalkboard can perform equally well as those taught with ICT.

The second finding of this study revealed that there was no significant difference in the mean achievement scores of male and female Accounting Education students in both ICT and conventional instructional methods. The t-test results showed $t(58) = 0.62$, $p > 0.05$ for ICT group and $t(58) = 0.73$, $p > 0.05$ for conventional group. This indicates that gender did not significantly influence the academic achievement of students regardless of the instructional method used. This finding supports Ezeani (2022) who reported that gender has no significant influence on academic achievement when modern instructional methods are employed. Okon (2021) also found that both male and female students benefit equally from technology-based instruction in Business Education because ICT provides equal learning opportunities. Uko and Nwachukwu (2022) stated that ICT bridges the gender gap in technical subjects because both male and female students have equal access to computers in the school environment. Okolie, Igwe and Mong (2019) similarly reported that interactive instructional methods eliminate gender bias and promote equal performance. Odigwe and Owan (2019) confirmed that both lecture and ICT methods affect male and female students equally when instruction is properly structured. On the contrary, this finding disagrees with Akinola (2020) who reported that male students performed better with ICT due to greater prior exposure to computers and technology at home. Ezenwafor (2019) found that female students experienced higher levels of computer anxiety, which affected their performance in ICT-based instruction. Babalola (2020) stated that female students performed better with conventional method because they are more attentive, take more notes and participate more in class discussions. Nwosu and Okeke (2019) observed that male students tend to dominate computer use during practical sessions, giving them an advantage over females. Oviawe (2021) also reported that cultural factors in some South-East schools make male students more confident in using technology than their female counterparts.

Conclusion

Based on the findings, it was concluded that ICT instructional delivery method is more effective in improving the academic achievement of Accounting Education students than conventional chalkboard method. It was therefore recommended that Business Education lecturers in Imo State should integrate ICT tools into teaching, government and school management should provide ICT facilities, and training should be organized for lecturers on the use of ICT for instructional delivery

Recommendations

1. Government and school management should provide adequate ICT facilities such as computers, projectors, and accounting software in Accounting Education departments.
2. Lecturers should be trained and retrained on the integration of ICT in instructional delivery.
3. Curriculum planners should emphasize ICT-based teaching to produce graduates that are competent for the digital economy.

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