Re-Engineering Teaching and Learning of Accounting and Word Processing through ICT and Collaborative Learning Approach: Implications on Learning Outcome

Igbinoba, Margaret Osamuede
margaret.igbinoba@gmail.com

Salawu, Moruff Adeyemi
salawumoruff@gmail.com

Oluwole-Moses, Omotayo Martina
obehigold@yahoo.co.uk

Owolabi, Janet Iyabode
janetowolabi2020@gmail.com

Ogunrinbokun, Bamidele Emmanuel
beogunrinbokun@gmail.com

School of Business Education, Federal College of Education (Technical) Akoka, Lagos.

Abstract

This study explored teaching and learning outcome enhanced by Information and Communication Technology (ICT) and collaborative learning approach in accounting and word processing by considering the performance of learners in evaluating this learning approach. The study adopts quasi experimental design involving learners from the School of Business Education, Federal College of Education (Technical) Akoka. Sixty (60) learners from the Nigerian Certificate of Education (NCE II) Accounting and Office Technology Management Education (OTME) Students 2022/2023 were purposefully selected for the study. Content of the training was assessed, and the questions administered were validated by experts in the field of business education and further subjected to test-retest reliability analysis which yielded a coefficient of 0.78 (strong positive correlation) indicating a high degree of reliability. Descriptive statistics were deployed to analyze the questions raised and independent samples t-test was deployed in testing formulated hypothesis. The results revealed a significant difference in performance of the learners before and after being exposed to ICT and collaborative learning approach. Among others, the study recommends that business education course content should be delivered through the use of ICT and a collaborative learning approach.

Keywords*: Accounting; Collaborative learning; ICT; Teaching; Learning; Word processing*

Introduction

The potential of Information and Communication Technology (ICT) and collaborative learning approach in enhancing education in Nigeria has gained more attention in recent years (Ajibade & Zaidi, 2023; Alyoussef, 2023). Through software applications, technology offers an alternative to conventional teaching methods. (Babalola, Manu, Cheung, Yunusa-Kaltungo, & Bartolo, 2023; Selvanathan, Hussin, & Azazi, 2020).

Effective teaching and learning require a harmonious interaction between teachers, students, and the subject matter, which includes the learning resources available. Several studies, including Al-Awidi and Al-Furaih (2023); Shutaleva et al. (2023) have supported this idea. The Nigerian government has launched several initiatives to promote the use of ICT in education. Some examples include the establishment of the National Information Technology Development Agency (NITDA) and the Nigerian Education Research and Development Council (NERDC). To encourage ICT integration in to the classroom, the government has also implemented policies such as the National Policy on Education (NPE) and the National Information and Communication Technology (NICT) Policy. These relationships can include any two or all three of the components. Although the teacher and learners are in the same room in a conventional lecture hall, the role of learning materials varies depending on the lecture technique for instance, the teacher has a smaller role in collaborative learning approach embedded with ICT. Learners are encouraged to interact with learning resources (Su & Zou, 2022). In such situations, rather

than focusing on a teachers-centered approach, the teacher facilitates the parameters for the design of teaching-learning tasks. Questions such as "What is taught?, What is learned?, Who is involved? and What relationships exist among these elements?" will be the primary concern of the teachers under this approach, while the learners are left to provide the lesson content.

The term "collaborative learning" refers to a variety of educational approaches that involve collaborative intellectual efforts by learners or learners and teachers (Said, Wahab, Muhamad Amin, & Rashid, 2020). Learners are typically grouped together in pairs or teams to engage in activities such as seeking understanding, finding solutions, creating products, and other similar activities. In this sense, "collaborative learning" refers to a situation in which two or more people learn or attempt to learn together (Gong, Kannan, & Ramakrishnan, 2022). It is a teaching style that encourages learners to take charge of the teaching activities. As a result, success of one learner positively influences the success of other learners.

In today's rapidly evolving educational landscape, the integration of ICT has become crucial in promoting effective teaching and learning experiences. In the field of accounting education, the incorporation of ICT tools and collaborative teaching methods has transformed the way accounting concepts are taught and understood. Word processing software has emerged as a fundamental component of this transformation, offering significant benefits for both teachers and students. Online Learning Management Systems (LMS) offer platforms where instructors can create virtual classrooms, share resources, and facilitate discussions among students. Video conferencing tools enable remote learners to actively participate in class discussions, ensuring inclusivity and accessibility for all students.

Word processing software plays a pivotal role in collaborative teaching in accounting education. Programs like Microsoft Word and Google Docs provide students with a flexible and dynamic environment for creating, editing, and sharing accounting-related documents. Word processing software offers features such as track changes, comments, and version control, allowing instructors to provide detailed feedback and suggestions on student work. Additionally, online accounting simulation games and virtual case studies enable students to apply their knowledge in realistic scenarios, enhancing their problem-solving and decision-making abilities. The integration of ICT tools, collaborative teaching methods, and word processing software has revolutionized the field of accounting education, providing students with collaborative environments that foster active learning and critical thinking. By embracing these technologies, educators can create engaging and interactive learning experiences, equipping students with the necessary skills and knowledge to succeed in the ever-changing accounting profession.

Statement of the problem

Education is essential for the advancement of any nation, including Nigeria, which has a population of over 200 million. However, numerous issues such as insufficient funding, poor infrastructure, inadequate teacher preparation, outdated curricula, and limited access to quality education are plaguing Nigeria's educational system, leading to low learning outcomes in accounting and word processing. The current approach to teaching and learning accounting and word processing in Nigeria lacks the integration of Information and Communication Technology (ICT) and collaborative learning, which are crucial for improving learning outcomes. Insufficient funding has hindered the availability of technology infrastructure in schools, preventing the adoption of ICT tools that can enhance instruction. Teachers often lack the necessary training

and support to effectively utilize these tools in their teaching practices. Outdated curricula and teaching methods further contribute to the low learning outcomes in accounting and word processing.

The COVID-19 pandemic has highlighted the need for re-engineering teaching and learning approaches that can overcome the limitations of distance learning and disruptions in the conventional classroom environment. This re-engineering process should address the issues of insufficient funding, lack of technology infrastructure, teacher training gaps, and outdated curricula. By embracing innovative approaches that leverage ICT tools and collaborative learning environments, Nigeria can significantly improve learning outcomes in accounting and word processing, ensuring that students are equipped with the necessary skills for success in the digital age.

Theoretical framework

The constructivism theory emphasizes that learners actively construct their own knowledge and understanding through active techniques such as real-world experiences, problem-solving, and reflection. It is highly significant in the context of re-engineering the teaching and learning of accounting and word processing through ICT and collaborative learning approaches. By incorporating ICT tools and collaborative learning strategies, learners are provided with opportunities to engage in active techniques that align with the constructivist approach.

ICT tools, such as accounting software and word processing applications, enable learners to interact with real-world scenarios and tasks. Collaborative learning approaches, where learners work together in groups or teams, promote active engagement and knowledge construction. Through discussions, peer interaction, and sharing of ideas, learners can deepen their understanding and refine their knowledge. Additionally, collaborative learning encourages learners to reflect on their own thinking and communicate their understanding, aligning with the constructivist principle of reflecting on and talking about what they are doing and how their understanding is changing.

The constructivist approach to teaching and learning in accounting and word processing can have significant implications on learning outcomes. Learners are more actively engaged in the learning process, developing critical thinking, problem-solving, and practical skills. They are motivated to explore real-world applications, make connections between theory and practice, and reflect on their learning experiences. This can lead to a deeper understanding of accounting and word processing concepts, improved competency in using relevant software and tools, and enhanced overall learning outcomes.

Research objectives

The aim of this study is to examine the effect of ICT and a collaborative learning approach on learning outcomes. The goal is to provide teachers with insights into how to effectively use ICT and collaborative learning to promote learner self-efficacy and achieve long-term improvements in learning outcomes. The study intends to specifically examine and compare the performance of students who have been exposed to ICT and collaborative learning to their performance in the conventional mode of learning in such a way so as to specifically;

1. Identify the difference in academic performance of learners exposed to ICT and collaborative learning strategy with those taught under conventional method.

2. Determine the difference in the pre-test and post-test mean scores of learners' academic performance to ICT and collaborative learning strategy.

Research questions

The study addressed the following research questions:

1. What is the mean difference in academic performance of learners exposed to ICT and collaborative learning strategy with those taught under conventional method?
2. What is the difference in the pre-test and post-test mean scores of learners' academic performance to ICT and collaborative learning strategy?

Hypothesis

To determine the statistical significance of the findings, the study's null hypothesis was developed and tested at a significance level of 0.05.

$H0_1$: There is no significant difference in the academic performance of learners exposed to ICT and collaborative learning strategy method in School of Business Education.

Literature review

Researchers in teacher education are advocating for a more holistic approach to teaching (Galanti & Holincheck, 2022; Yusuf, 2022). Teacher education in particular focuses on how teachers may tap into their inner potential and resources of their learners in creating ideal teaching environments in which learners can thrive. Conventional teaching education methods must be refused in favor of collaborative teaching that is far more learner-centered, according to the realistic method and core reflection approach (Niyonsaba, Baptiste Nkurunziza, & Hakizimana, 2022).

The demand for innovative educational products which leverages on advancement in information technology and telecommunications has led to deployment of ICT in enhancing learning process. The major features of these systems have been found to support online learning including course management assessment, learners progress tracking, gradebook, communications security and Smartphone access (Najm, Alsamaraee, & Jalal, 2022; Turnbull, Chugh, & Luck, 2020).

Lopes (2014) who used the Moodle as a case study found that ICT provides a platform where learners and educators can combine face-to-face instructions with computer-mediated instruction and blended learning, thereby increasing possibilities for better quantity and quality of human communication in a learning background. Umeana and Tanimowo (2022) also found that blended learning improved students' academic performance in biology. Although this study takes an innovative approach to teaching in Nigerian schools. This has led to positive and optimistic responses from educators and learners regarding preference, utilization, appreciation and satisfaction for teaching and learning using ICT at higher educational institutions (Hassan, Sa'id, & Mohammed, 2021).

The advantages and difficulties of collaborative teaching and learning in higher education were examined by Zhao et al. (2015). The study offered a thorough overview of the body of research on collaborative learning including team-based learning, peer teaching and group work. It offered insights into the advantages of collaborative learning which includes raised student interest, heightened social skills and improved critical thinking. However, it was limited by the fact that it is a review of the literature and does not offer any fresh empirical evidence. Also,

strategies for incorporating collaborative learning in the classrooms were not discussed. To address these limitations, more research is required.

Olabiyi (2015) studied the efficiency of multimedia instructional materials for imparting practical knowledge of automotive technology to students in Nigerian technical colleges. Although the study only focuses on one subject area and offers no insights into the efficacy of other subject areas, it found that the use of multimedia materials improved students' practical skills.

According to Gambari et al. (2013); Olatunde-Aiyedun and Adams (2022), blended learning improved students' academic performance in a Nigerian science education program. Also, the study of Odewumi et al. (2018) examined the effectiveness of podcasts as teaching aids in Nigerian teacher education which observed 40 research participants founds out that podcasts improved students' learning outcomes.

Olanrewaju et al. (2020) evaluated teachers' readiness for integrating technology. They discovered that although teachers had a generally positive attitude toward using technology in the classroom, many are impaired by lack of pedagogical knowledge and technological know-how to do so. This was corroborated by Onajite (2022) who examined teachers' attitudes towards ICT integration and their levels of readiness for it in economics education. Despite the teachers' positive attitudes toward the integration, they discovered that they lacked the knowledge and experience needed to successfully incorporate ICT into their teaching methods.

The academic achievement of secondary school students in Osun State, Nigeria, and the use of digital technology were found to be positively correlated by Adedokun-Shittu et al. (2020).
The potential of game-based learning to advance 21st-century skills in Nigerian primary schools was investigated by Imoke et al. (2021). They discovered that it might improve students' collaborative, critical thinking, and problem-solving skills. This was in line with findings from the study of Amaewhule et al. (2020) that investigated the opportunities and difficulties of gamification in Nigerian classrooms and discovered that it had the potential to raise student motivation and engagement. However, challenges of implementation included poor teacher preparation and limited access to technology. The study gives a broad overview of gamification but does not go into detail about which gamification techniques work best in Nigerian classrooms.

The literature on the connection between ICT and the growth of high-quality education in Nigeria is reviewed by Kabir and Kadage (2017). Although ICT has the potential to improve education, the author found that there are significant infrastructure, policy, and funding challenges. The study offers a thorough analysis of the literature but no empirical information.
The effects of mobile learning on students' academic performance in higher education in Nigeria were assessed by Aremu and Adeoluwa (2021). They discovered that mobile learning improved the academic performance of students.

Methodology

The study adopted the quasi experimental design involving learners from School of Business Education, Federal College of Education (Technical) Akoka. The researchers purposively selected two groups of 30 learners each to make a total of 60 learners from the entire population of the second year, Nigerian Certificate of Education (NCE II) Accounting and Office

Technology Management Education (OTME) Students 2022/2023 academic session. Training was held concurrently for the two groups. An achievement test was conducted before and after the training to ascertain the performance of the students under consideration. Assessment was carried out on the content of the training module. The questions administered were validated by experts in the field of Business Education and also subjected to test-retest reliability analysis using Pearson correlation which yielded a coefficient of 0.78 (strong positive correlation) indicating a high degree of reliability. Descriptive statistics (mean and standard deviation) were used to analyze the performance of learners while independent samples t-test was deployed in testing the formulated hypothesis. The first group (experimental group) was exposed to the usage of ICT and collaborative learning approach while the second group (control group) was taught using the conventional approach which is more teacher-centered in teaching the two modules under consideration. Two modules that were taken into consideration for the study were the preparation and presentation of final accounts for a sole proprietor as well as the writing and typing of business letters, tables and memos using spreadsheet and word processing software.

Results

The results from the analyses carried out are presented as follows;

Research question 1: What is the mean difference in academic performance of learners exposed to ICT and collaborative learning strategy with those taught under conventional method?

Table 1: Mean gain scores of learners' academic performance

Groups	Teaching method	Pre-test (N)	Post-test (N)	Pre-test (M_1)	Post-test (M_2)	Mean gain
Experimental	ICT & collaborative learning	30	30	9.70	20.53	10.83
Control	Collaborative learning	30	30	4.71	8.85	4.14

According to Table 1, the pre-test mean score of the experimental group that introduced ICT and collaborative learning strategy was 9.70, while the control group that used the conventional method was 4.71. The mean post-test scores for the experimental and control groups were 20.53 and 8.85, respectively. The analysis of the experimental and control groups' pre-test and post-test scores revealed a mean gain of 10.83 and 4.14, respectively. The statistically significant difference in mean gain score between the two groups demonstrated that students exposed to ICT and collaborative learning approaches significantly improved their performance.

Research question 2: What is the difference in the pre-test and post-test mean scores of learners' academic performance to ICT and collaborative learning strategy?

Table 2: Performance comparison of learners exposed to ICT and collaborative learning.

Group	Teaching method	N	Pre-test Mean	Post-test Mean	Mean Difference
Experimental	ICT & Collaborative learning	30	9.70	20.53	10.83

Table 2 above showed that the pre-test and post-test mean scores of learners taught with ICT and collaborative learning were obtained as 9.7 and 20.53 respectively, giving a mean difference of 10.83. This is an indication that the performance of learners exposed to ICT and collaborative learning improved.

Hypothesis Testing

$H0_1$: There is no significant difference in the academic performance of the learners exposed to ICT and collaborative learning strategy method in School of Business Education.

Table 3: Independent t-test Results for Pretest and Posttest Scores

Group	Mean	Std. Dev.	t-value	Df	p-value (2-tailed)
Pretest Score	9.70	5.046	6.386	49.645	.000
Posttest Score	20.53	7.802	6.386	58	.000

Note: The pretest scores (Group 1) were significantly lower than the posttest scores (Group 2), $t(49.645) = 6.386$, $p < .05$.

The results of the independent t-test indicate that there is a significant difference between the posttest scores (Group 2) and pretest scores (Group 1) for the learners exposed to ICT and collaborative learning strategy method in School of Business Education. The means indicate that the posttest scores were higher than the pretest scores, with a mean score of 20.53 for Group 2 and a mean score of 9.70 for Group 1. The t-value of 6.386 for both groups is statistically significant at a 95% confidence level, indicating that the difference between the means is unlikely to have occurred by chance alone.

The degrees of freedom are 58 for Group 2 and 49.645 for Group 1. The p-value of 0.000 (or .000) for both groups is less than the study's threshold of 0.05, providing strong evidence against the null hypothesis that there is no significant difference in the pretest and posttest scores of the learners exposed to ICT and collaborative learning strategy method in School of Business Education.

In summary, the results suggest a significant difference in performance of the learners before and after being exposed to ICT and collaborative learning strategy method, indicating that this method is effective in improving student performance in the School of Business Education.

Discussion

In providing answers to research question one; table 1 provided details on the mean gain scores of learners' academic performance. When compared to the control group's conventional method, introducing ICT and a collaborative learning approach improved the experimental group's performance. Statistical analysis of the post-test and gain scores revealed that the experimental group outperformed the control group significantly. This implies that implementing ICT and collaborative learning techniques can be an effective method to enhance learning outcomes and promote active participation in learning process. This result is consistent with Olabiyi's (2015) argument that the use of multimedia materials enhanced learners' practical skills and cognitive abilities.

The mean difference between learners' pre-test and post-test scores, as shown in Table 2, indicated that the use of ICT and collaborative learning strategies improved learners' performance. This demonstrates the effectiveness of innovative teaching methods in improving students' learning outcomes and emphasizes the significance of involving learners in the learning process. This finding conforms with the observations of Lopes (2014), who concluded that there are more opportunities for improved performance when learners are exposed to computer-mediated instruction and collaborative learning approach.

From table 3, the study discovered that the ICT and collaborative learning strategy method had a significant positive impact on students' academic performance in the School of Business Education when compared to their pretest scores. The posttest group's higher mean score indicates a significant improvement in performance. The t-value and p-value indicate that the difference in means between the two groups is statistically significant, indicating that the ICT and collaborative learning strategy method is an effective approach for improving students' learning outcomes. The smaller sample size in Group 1 had no effect on the results. The finding is consistent with the Constructivism theory and the findings of Gambari et al. (2013); Olatunde-Aiyedun and Adams (2022); Umeana and Tanimowo (2022) which revealed an improvement in learners' academic performance after exposure to ICT and collaborative learning approach

Conclusion

The study concluded that ICT and collaborative learning approaches enable learners to learn in groups by sharing their perspectives, ideas and perceptions, thereby promoting learning outcomes. ICT and collaborative learning are viewed as critical tools for promoting a positive learning attitude in students. Thus, when properly implemented, ICT and a collaborative learning approach are regarded as essential for improving instruction delivery in business education.

Recommendations

Based on findings, the study recommends that;

1. Business education course content should be delivered through the use of ICT and a collaborative learning approach.
2. ICT and collaborative approaches to learning should be promoted in educational institutions towards improving social interactions and learning outcomes.
3. Management in educational institutions should make it easier for teachers and learners to collaborate in business education courses such as accounting and OTME.

Acknowledgement

This research was completed with the essential financial assistance of TETFund and the conducive environment provided by management of FCE (T) Akoka, Lagos.

References

Adedokun-Shittu, N. A., Ajani, A. H., Nuhu, K. M., & Shittu, A. J. K. (2020). Augmented reality tool instructional in enhancing geography learners academic performance and retention in Osun state Nigeria. *Education and Information Technologies*, *25*(4), 3021–3033. doi:10.1007/s10639-020-10099-2

Ajibade, S. S. M., & Zaidi, A. (2023). Technological Acceptance Model for Social Media Networking in e-Learning in Higher Educational Institutes. *International Journal of Information and Education Technology*, *13*(2), 239–246. doi:10.18178/ijiet.2023.13.2.1801

Al-Awidi, H. M., & Al-Furaih, S. A. A. (2023). Teachers' informal learning characteristics in using open educational resources in relation to their innovative work behavior. *The International Journal of Information and Learning Technology*, *40*(2), 113–129. doi:10.1108/IJILT-03-2022-0057

Alyoussef, I. Y. (2023). Acceptance of e-learning in higher education: The role of task-technology fit with the information systems success model. *Heliyon*, *9*(3), 1–19. doi:10.1016/j.heliyon.2023.e13751

Amaewhule, E. C., Obikoya, O. G., & Okeowhor, D. O. (2020). Teachers ' Gamification of

Classroom Instructions ffor Secondary Education Goals Attainment in Rivers State, Nigeria. *European Journal of Education Studies*, *7*(11), 738–752. doi:10.46827/ejes.v7i11.3494

Aremu, B. V., & Adeoluwa, O. (2021). Assessing Students' Learning Attitude and Academic Performance Through m-Learning During the COVID-19 Pandemic. *Canadian Journal of Learning and Technology*, *47*(3), 1–21. doi:10.21432/cjlt28085

Babalola, A., Manu, P., Cheung, C., Yunusa-Kaltungo, A., & Bartolo, P. (2023). A systematic review of the application of immersive technologies for safety and health management in the construction sector. *Journal of Safety Research*, *3*(4), 1–20. doi:10.1016/j.jsr.2023.01.007

Galanti, T. M., & Holincheck, N. (2022). Beyond content and curriculum in elementary classrooms: conceptualizing the cultivation of integrated STEM teacher identity. *International Journal of STEM Education*, *9*(1), 1–10. doi:10.1186/s40594-022-00358-8

Gambari, A. I., Shittu, A. T., Ogunlade, O. O., & Osundale, O. R. (2013). Effectiveness of Blended Learning And E-Learning Modes of Instruction on The Performance of Undergraduates In Kwara State, Nigeria. *Malaysian Online Journal of Educational Sciences*, *5*(1), 25–36. Retrieved from www.moj-es.net

Gong, X., Kannan, S., & Ramakrishnan, K. (2022). Impact of Mobile Technology on Collaborative Learning in Engineering Studies. *European Journal of Educational Research*, *11*(3), 1245–1257. Retrieved from https://www.researchgate.net/profile/Suntonrapot-Damrongpanit/publication/356662582_Effects_of_Mindset_Democratic_Parenting_Teaching_and_School_Environment_on_Global_Citizenship_of_Ninth-grade_Students/links/61a6dda685c5ea51abc0f7b6/Effects-of-Mindset-Dem

Hassan, Z., Sa'id, A. S., & Mohammed, H. A. (2021). Is Distance E-Learning Option Acceptable by Nigerians Amidst COVID-19 Pandemic? *African Journal of Education and Practice*, *7*(1), 11–25. doi:10.47604/ajep.1193

Imoke, J. E., Nkanu, C. U., Bisong, A. E., & Edet-Asuquo, A. (2021). Integration of Game-Based Instruction into Teaching-Learning Processes in Tertiary Institutions: Significance to 21 st Century Education. *International Journal of Innovation and Research in Educational Sciences*, *8*(5), 342–350. Retrieved from https://www.researchgate.net/profile/Celestine-Nkanu/publication/356109966_Integration_of_Game-Based_Instruction_into_Teaching-Learning_Processes_in_Tertiary_Institutions_Significance_to_21st_Century_Education/links/618d801e07be5f31b76d5f45/Integration-of

Kabir, F. S., & Kadage, A. T. (2017). ICTS and educational development: The utilization of mobile phones in distance education in Nigeria. *Turkish Online Journal of Distance Education*, *18*(1), 63–76. doi:10.17718/tojde.285716

Lopes, A. P. (2014). Learning Management Systems in Higher Education: A Student Perspective. *EDULEARN14 Conference Proceedings*, (July), 4046–4055. doi:ISBN: 978-84-616-0763-1

Najm, Y. A., Alsamaraee, S., & Jalal, A. A. (2022). Cloud computing security for e-learning during COVID-19 pandemic. *Indonesian Journal of Electrical Engineering and Computer Science*, *27*(3), 1610–1618. doi:10.11591/ijeecs.v27.i3.pp1610-1618

Niyonsaba, A., Baptiste Nkurunziza, J., & Hakizimana, E. (2022). Impacts of Collaborative Learning on Learners' Academic Performance in Chemistry in Three Selected Secondary Schools of Nyamasheke District. *African Journal of Educational Studies in Mathematics and Sciences*, *18*(2), 17–27. Retrieved from http://creativecommons.org/licenses/by-nc-nd/4.0.DOI:https://dx.doi.org/10.4314/ajesms.v18i2.2

Odewumi, M. O., Omoyajowo, B. S., Onojah, A. O., & Ajala, I. R. (2018). Students Exploring Educational E-learning Technology of Podcasts on Fine Arts Instruction in Nigeria Universities. *Pakistan Journal of Education*, *35*(2), 175–192. doi:10.30971/pje.v35i2.549

Olabiyi, O. S. (2015). Design and Utilisation of Educational Technology Resources for Improving Teaching and Learning of Technical Vocational Education and Training Programmes in Nigerian. *Innovative Applications OfEducational Technology Tools in Teaching and Learning*, *2*(1), 121–144.

Olanrewaju, I. S., Ishola, A. K., Nurudeen, S. O., & Ayuba, I. A. (2020). Impact of board diversity on corporate social responsibility of listed oil and gas firms in nigeria. *International Journal of Management and Sustainability*, *9*(4), 194–206. doi:10.18488/journal.11.2020.94.194.206

Olatunde-Aiyedun, T. G., & Adams, O. S. (2022). Effect of Blended Learning Models on Students' Academic Achievement and Retention in Science Education. *Education, Sustainability & Society (ESS)*, *5*(2), 74–80. doi:10.26480/ess.02.2022.74.80

Onajite, G. O. (2022). Investigation of Student-Teachers Readiness and Attitude Towards Utilization of ICT in Studying Business Education in Delta State, Nigeria. *American Journal of Economics and Business Innovation (AJEBI)*, *1*(2), 11–22.

Said, M. M., Wahab, A. A., Muhamad Amin, A., & Rashid, I. Z. (2020). Audit Committee Effectiveness and Sustainability Disclosure of FTSE4G Bursa Malaysia Indexed Companies. *International Journal of Accounting, Finance and Business (IJAFB)*, *5*(30), 248–257.

Selvanathan, M., Hussin, N. A. M., & Azazi, N. A. N. (2020). Students learning experiences during COVID-19: Work from home period in Malaysian Higher Learning Institutions. *Teaching Public Administration*, *4*(1), 13–22. doi:10.1177/0144739420977900

Shutaleva, A., Martyushev, N., Nikonova, Z., Savchenko, I., Kukartsev, V., Tynchenko, V., & Tynchenko, Y. (2023). Sustainability of Inclusive Education in Schools and Higher Education: Teachers and Students with Special Educational Needs. *Sustainability (Switzerland)*, *15*(4), 1–18. doi:10.3390/su15043011

Su, F., & Zou, D. (2022). Technology-enhanced collaborative language learning: theoretical foundations, technologies, and implications. *Computer Assisted Language Learning*, *35*(8), 1754–1788. doi:10.1080/09588221.2020.1831545

Turnbull, D., Chugh, R., & Luck, J. (2020). Encyclopedia of Education and Information Technologies. *Encyclopedia of Education and Information Technologies*, (August), 0–7. doi:10.1007/978-3-319-60013-0

Umeana, M. I., & Tanimowo, R. (2022). Blended learning instructional strategy: A tool for improving students academic achievement in Biology. *Innovations*, *71*(1), 691–697.

Yusuf, H. T. (2022). Teachers Evaluation of Concurrent and Consecutive Teacher Education Models in South-west, Nigeria. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *4*(2), 107–117. doi:10.23917/ijolae.v4i2.17599

Zhao, P., Sara, S., & Kynäslahti, H. (2015). The pedagogical functions of arts and cultural-heritage education with ICTs in museums. *International Journal of Instructional Technology and Distance Learning*, *12*(1), 7–14.