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## UTILISATION OF ONLINE RESOURCES AND LEARNING OUTCOMES OF UNDERGRADUATES IN NIGERIAN UNIVERSITIES

### ВИКОРИСТАННЯ ОНЛАЙН РЕСУРСІВ І РЕЗУЛЬТАТИ НАВЧАННЯ СТУДЕНТІВ В НІГЕРІЙСЬКИХ УНІВЕРСИТЕТАХ

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#### ABSTRACT

*The integration of online learning resources in higher education has profoundly reshaped the educational landscape and the learning outcomes of undergraduates in universities.*

**Purpose.** This study examined the utilization of online resources and learning outcomes of undergraduates in Nigerian universities. The study hinges on the connectivism theory. Connectivism theory is considered relevant particularly in the digital age, where technology plays a crucial role in connecting learners to vast amounts of information.

**Methodology.** The study adopted a descriptive survey research design. Obafemi Awolowo University (OAU), which is adjudged to be the leading ICT university in Nigeria, was purposively selected for the study with a sample size of 600 students using a simple random sampling technique.

*Інтеграція навчальних онлайн ресурсів у вищу освіту глибоко змінила освітній ландшафт і результати навчання студентів університетів.*

**Мета.** Це дослідження вивчало використання онлайн ресурсів і результати навчання студентів нігерійських університетів. Дослідження базувалося на теорії коннективізму. Теорія коннективізму вважається особливо актуальною в епоху цифрових технологій, коли технології відіграють вирішальну роль у залученні студентів до величезних обсягів інформації.

**Методологія.** У дослідженні було прийнято описовий дизайн опитування. Університет Обафемі Аволово (ОАУ), який вважається провідним університетом з використання інформаційно-комукаційних технологій у Нігерії, був обраний для дослідження з розміром вибірки 600 студентів із використанням простої техніки випадкової

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Data was collected using questionnaires, and gathered data were analyzed using descriptive and inferential statistics.

**Results.** The results showed that online resources were seen as valuable tools for improving learning experiences. It further showed that the influence of online resources on academic performance and learning outcomes could vary among individuals, and may depend on factors such as the quality of resources, individual learning styles, and access to technology. The hypothesis tested indicates strong statistical evidence that online resource utilization had a significant influence on the learning outcomes of undergraduates in the study area.

**Conclusion.** The need for educational institutions to improve the accessibility and quality of online resources for their students. The need for policies on the use of online resources to ensure that students use these resources responsibly, and productively was equally recommended.

**Keywords:** online resources, utilization, learning outcomes, undergraduates, information.

вибірки. Дані збиралися за допомогою анкет, а зібрані дані аналізувалися за допомогою описової та інференційної статистики.

**Результати.** Результати показали, що онлайн ресурси розглядаються як цінні інструменти для покращення результатів навчання. Крім того, було показано, що вплив онлайн ресурсів на академічну успішність і результати навчання може відрізнятися серед студентів і може залежати від різних факторів, таких як якість ресурсів, індивідуальні стилі навчання та доступ до технологій. Перевірена гіпотеза вказує на вагомості статистичні докази того, що використання онлайн ресурсів мало значний вплив на результати навчання студентів у досліджуваній галузі.

**Висновок.** Існує потреба закладів вищої освіти у покращенні доступності та якості онлайн ресурсів для своїх студентів. Рекомендовано розробити політику щодо використання онлайн ресурсів, щоб студенти використовували ці ресурси відповідально та продуктивно.

**Ключові слова:** онлайн ресурси, використання, результати навчання, студенти, інформація.

## INTRODUCTION

Assessing the utilization of online learning resources and the influence on learning outcomes of undergraduates in universities is a critical aspect of evaluating the effectiveness of digital learning environments. With the advancement of technology, online learning has become increasingly popular, especially in higher education institutions. However, the success of online learning largely depends on the extent to which students utilize the available resources, and how these resources impact their academic performance. To assess the utilization of online learning resources, various factors need to be considered.

One of the critical factors is the availability of resources. This involves evaluating the number and quality of online learning resources available to students. Universities, as part of their support, are expected to provide a variety of resources, such as lecture notes, textbooks, videos, interactive simulations, and quizzes, to ensure that students have access to the information they need to succeed. Another factor is the ease of access to resources. This involves evaluating the accessibility of online learning resources. The influence of online learning resources on learning outcomes can be evaluated through various metrics, such as grades, test scores, and student engagement.

For instance, students who utilize online resources such as lecture videos and interactive simulations tend to perform better in exams, compared to those who rely solely on traditional classroom lectures. Moreover, online resources can enhance student engagement, motivation, and critical thinking which are essential components of academic success.

The extensive integration of online learning resources in higher education has profoundly reshaped the educational landscape for undergraduate students in universities. However, despite the wide availability and potential advantages of these resources, there exists a substantial variance in their utilization among students, leading to the emergence of various challenges. The paradigm shifts towards online learning, catalyzed by the COVID-19 pandemic, has underscored the imperative for universities to delve into the efficacy of online learning resources in fostering positive learning outcomes.

Even though these resources are readily accessible, there is a dearth of comprehension regarding how students leverage them, and their effects on academic performance. Undergraduate students exhibit a broad spectrum of engagement levels with online learning resources. While some students wholeheartedly embrace these resources, others may underutilize or disregard them altogether. The identification of factors contributing to these divergent utilization patterns is paramount in enhancing resource adoption, and efficacy. Moreover, the influence of online learning resources on the scholastic performance, and learning achievements of undergraduates is not uniform across the student body. Consequently, it is imperative to scrutinize the relationship between resource utilization and learning outcomes to gauge the effectiveness of these tools in enhancing student performance.

Furthermore, several factors can sway students' decisions to employ or shun online learning resources. These factors may encompass technological proficiency, academic motivation, learning preferences, resource accessibility, institutional support, and individual perceptions. The identification and analysis of these factors are pivotal for optimizing resource utilization strategies. This study seeks to provide insights into the prevailing state of online learning resource utilization among undergraduates, and its implications on their academic achievements.

The findings from this research would contribute to the formulation of evidence-based strategies aimed at augmenting the integration of resources, improving the educational experience, and ultimately optimizing academic accomplishments for undergraduate students in higher education. The outcome of this study is expected to provide comprehension of the effectiveness of online learning resources in bolstering the academic achievements of undergraduates and provide guidance for policy decisions pertaining to the integration of online learning resources at Obafemi Awolowo University. The **study purpose** will be guided by two research questions and one hypothesis.

1. What online resources are available to undergraduates in the study area?
2. What is the extent of utilization of online resources in the area?

Research Hypothesis:

Utilization of online resources has no significant influence on learning outcomes of undergraduates in the study area.

## LITERATURE REVIEW

### – Online Learning

Online learning resources have become increasingly popular over the years, providing individuals with a vast array of educational opportunities. These resources have been designed to cater to different learning styles, schedules, and interests. Garrison and Anderson (2003) in Otemuyiwa (2023) refer to the digital materials, tools, and content that are available on the internet, and designed to support various aspects of education and learning.

These resources represent a wide spectrum of options, including, but not limited to digital textbooks, video lectures, discussion forums, learning management systems, and interactive simulations. Online resources are a fundamental component of contemporary education, offering diverse opportunities for self-directed learning, collaboration, and access to information in a digital format. Furthermore, online resources, in the context of education, are digital materials, tools, and content accessible via the internet, designed to support learning. Online resources can include e-books, video lectures, web-based courses, and various digital platforms that facilitate learning.

#### – **The Concept of Utilization and Online Resource Utilization**

Utilization refers to user perceptions, and behavioral impacts pertain to the extent to which individuals employ a particular technology or system in their activities. In the context of online learning, utilization refers to how students engage with, and make use of available online resources. It encompasses actions such as accessing digital materials, participating in online discussions, submitting assignments through digital platforms, and generally leveraging technology for educational purposes.

Understanding utilization is essential for assessing the effectiveness of online resources in facilitating learning. In the same vein, utilization, as articulated by Babalola (2016) refers to the extent to which individuals, including students in Nigerian educational institutions, make use of technological tools and resources for learning purposes. It involves actions such as accessing e-learning platforms, participating in online discussions, and interacting with digital content to enhance their educational experience.

Samuel (2016) described online resources utilization as the ways and means by which students engage with, and harness digital educational materials and tools provided through online platforms. This concept is pivotal for evaluating the effectiveness of e-learning resources in the Nigerian higher education context, and optimizing their integration to enhance learning outcomes. It involves the engagement and interaction of students with the digital materials and tools available through online platforms in the context of their educational endeavors. It encompasses how students access, navigate, and employ these resources to support their learning goals. This concept is pivotal for educational institutions and researchers to assess the impact of online resources on students' academic performance, and to optimize the integration of technology in education (Ajegbelen, 2016).

#### – **Learning Outcomes**

Learning outcomes, simply put signify the measurable knowledge, skills, and competencies that students acquire during their academic journey. Leonard and Snyman (2019) noted the importance of assessing and improving learning outcomes to ensure that education aligns with the objectives, and standards set by universities, and educational authorities. Payal and Kanvaria (2018) described learning outcomes as the measurable knowledge, skills, and abilities that students acquire as a result of their educational experiences. Learning outcomes are the desired end results of the learning process, and provide a clear framework for assessing the effectiveness of education.

These outcomes can include both cognitive aspects, such as knowledge and critical thinking skills, and affective aspects, like attitudes and values. Learning outcomes serve as a means to gauge the impact of educational interventions, and to ensure that education aligns with its objectives. In a nutshell, learning outcomes refer to the academic achievements, performance, and overall learning progress of students. These

outcomes can be assessed through various indicators, such as grades obtained in courses, assessment scores, completion rates, and instructor feedback regarding students' progress, and understanding of course content. (Amaoge & Ejike, 2018)

## **THEORETICAL FRAMEWORK**

The selected theoretical framework is the connectivism theory. Connectivism theory is considered relevant in this digital age, where technology plays a crucial role in connecting teachers, researchers, and learners to a vast amount of information. Connectivism is a learning theory that was introduced by George Siemens in 2005. It is particularly relevant in the context of the digital age, where information is abundant, and the landscape of knowledge is constantly evolving. Unlike traditional learning theories that focus on individual knowledge acquisition or social interactions, connectivism places a strong emphasis on the role of networks and connections in the learning process.

Some key principles and concepts associated with connectivism include networks and connections. Connectivism views learning as the process of making connections within a network. These connections can be formed between people, information sources, and digital technologies. Connectivism recognizes that knowledge is distributed across networks, and that individuals tap into these networks to access information and expertise. Another associated concept is digital age and technology. The theory also acknowledges the impact of digital tools, social media, and online platforms in shaping how individuals learn and acquire knowledge. One of the principles of connectivism is distributed learning. Knowledge is not solely located within an individual's mind, but is distributed across networks.

Connectivism suggests that the ability to tap into this distributed knowledge is a critical skill in the digital era. Learning is not confined to formal educational settings, but occurs through a continuous process of connecting to information sources, and interacting with diverse perspectives. Learning is viewed as network formation, and the process of forming connections, and navigating networks. These connections can be dynamic, and may change as new information becomes available. The theory suggests that the capacity to traverse, and to adapt to various networks is essential for effective learning in a rapidly changing world.

Connectivism shares some similarities with the concept of "rhizomatic learning," which is based on the concept of a rhizome: a continuously growing horizontal stem with interconnected roots. In a rhizomatic approach to learning, knowledge is not hierarchical, but spreads laterally, allowing learners to explore, and connect ideas in non-linear ways. In a nutshell, learning can be said to be continuous.

Learners in a connectivist framework are autonomous, and self-directed. They are responsible for creating their learning paths, actively seeking information, and forming connections within networks. The role of the learner is not just to acquire static knowledge, but to navigate dynamic networks, and adapt to changing information landscapes. Connectivism encourages learning in open, online spaces where individuals can engage with a diverse range of perspectives, and contribute to collective knowledge-building. Social media, online forums, and collaborative platforms are seen as valuable spaces for learning in a connectivist framework.

Connectivism provides a lens through which to understand how individuals learn in the digital age by emphasizing the importance of networks, connections, and the ability to adapt to a rapidly changing information landscape. It acknowledges the role of technology in shaping learning experiences, and underscores the need for learners to be adept at navigating, and contributing to diverse networks of information. This theory is considered relevant to the current study because students, particularly undergraduates, are actively

involved in learning and as such, they need a lot of information which online resources make available. Therefore, the extent to which these resources are utilized becomes very important.

**METHODOLOGY**

This study adopted a descriptive survey of research design. The population comprised all 37, 892 undergraduates across all the thirteen faculties in Obafemi Awolowo University (OAU) in southwest Nigeria. OAU, which is one of the first-generation universities in Nigeria, was selected because it is adjudged to be the leading university in Nigeria in terms of Information and Communication Technology (ICT).

A sample size of 600 students (315 male, and 285 female) from five faculties were selected using a simple random sampling technique. Data was collected using questionnaires. The collection of data took six weeks, and the participants were enthusiastic about the research focus: some of them described it as a very topical issue particularly in this age of artificial intelligence. The data gathered was analyzed using descriptive and inferential statistics. The research questions were analyzed using frequency counts, and percentages while the research hypothesis was analyzed using chi-square statistics. Appropriate ethical clearance was obtained from the Faculty of Education Research Committee which also grants ethical clearance for research conducted within the faculty.

**RESULTS**

**Research Question 1: What online resources are available to undergraduates in the study area?**

**Table 1**

*Analysis of online resources available to undergraduates*

Variable	Always F (%)	Never F (%)	Often F (%)	Sometimes F (%)
Internet	469(78.2)	5(0.8)	86(14.3)	40(6.7)
ChatGPT	129(21.5)	23(3.8)	333(55.5)	115(19.2)
Intranet	77(12.8)	161(26.8)	169(28.2)	193(32.2)
Mobile phone, tablets, iPads, etc.	473(78.8)	2(0.3)	103(17.2)	22(3.7)
E-mail	187(31.2)	8(1.3)	336(56)	69(11.5)
Online digital video	98(16.3)	35(5.8)	315(52.5)	152(25.3)
Laptops	248(41.3)	13(2.2)	274(45.7)	65(10.8)
Wi-Fi	144(24)	16(2.7)	343(57.2)	97(16.2)
E-Books	116(19.3)	26(4.3)	337(56.2)	121(20.2)
E-Library	91(15.2)	35(5.8)	236(39.7)	238(39.7)

**Source:** Field Survey, 2023

Table 1 presents data related to the analysis of online resources available to undergraduates. Respondents were asked to indicate how frequently they used various online resources for their academic pursuits. The data was categorized into four response options: Always, Never, Often, and Sometimes.

The data showed that a substantial majority of undergraduates (78.2%) reported always using the internet for their academic needs. This emphasized the pivotal role of the internet in modern education, serving as the primary gateway to a wealth of online

learning resources, including research materials, online courses, and educational websites. ChatGPT, an AI chatbot, was frequently utilized, with 55.5% of respondents stating that they often accessed it for academic purposes. This indicated a growing trend of students turning to AI-powered chatbots for immediate assistance and information.

The high percentage (78.8%) of students who always used mobile devices, including tablets and iPads, for academic purposes highlighted the importance of mobile-friendly educational content and platforms. The data indicated that e-mail remained a commonly used communication tool for academic purposes, with 56% of students often utilizing it. Online digital video resources, such as educational videos, were frequently accessed by 52.5% of respondents. Video content has proven to be an effective learning tool. Both laptops (41.3%) and Wi-Fi (57.2%) were widely used resources for academic activities. E-books (56.2%) and E-libraries (39.7%) were commonly used resources among students.

The data from Table 1 underscored the diverse array of online resources that undergraduates utilized for their academic needs. Institutions had adapted to these preferences by ensuring reliable internet access, optimizing content for mobile devices, integrating AI chatbots, and leveraging the educational potential of video content. Additionally, they had fostered effective communication through e-mail, and enhanced access to e-books and e-libraries, contributing to a more robust online learning environment. These findings provide valuable insights for educational institutions that seek to enhance the digital learning strategies offered, and support students in their online educational journeys.

**Research Question 2: What is the extent of utilization of online resources in the study area?**

**Table 2**

*Analysis of Extent of utilisation of online resources by undergraduates*

Variable	Daily F (%)	Monthly F (%)	Weekly F (%)	Not at all F (%)
Wi-Fi	197(32.8)	93(15.5)	283(47.2)	27(4.5)
E-journals	36(6.0)	301(50.2)	183(30.5)	80(13.3)
E-textbooks	541(9.0)	178(29.7)	320(53.3)	48(8)
Laptops	319(53.2)	48(8)	210(35)	23(3.8)
Tablet PC	99(16.5)	89(14.8)	119(19.8)	293(48.8)
Smartphone	519(86.5)	17(2.8)	60(10)	4(0.7)
Dedicated ICT laboratory	24(4.0)	135(22.5)	96(16)	345(57.5)
E-library	30(5)	260(43.3)	220(36.7)	90(15)
Google classroom	34(5.7)	197(32.8)	322(53.7)	47(7.8)
E-Mail	141(23.5)	85(14.2)	357(59.5)	17(2.8)
YouTube	130(9.3)	110(18.3)	347(57.8)	13(2.2)

**Source:** Field Survey, 2023

Table 2 provides a detailed analysis of the extent to which undergraduates utilized various online resources, and how frequently they engaged with them. A significant portion of undergraduates relied on Wi-Fi, with 32.8% using it daily, 47.2% using it weekly, 15.5% using it monthly, and only 4.5% not using it at all. E-Journals were predominantly accessed on

amonthly basis by 50.2% of students, with 30.5% using them weekly, and 13.3% not using them. E-textbooks were widely used, with 53.3% using them weekly, 29.7% using them monthly, 9.0% using them daily, and 8.0% not using them. Laptops were the primary daily device for over half of the respondents (53.2%), used weekly by 35.0%, and not used at all by 3.8%. Tablet PCs had limited usage, with 48.8% not using them, 19.8% using them weekly, 14.8% using them monthly, and 16.5% using them daily. Smartphones were the most frequently used devices, with 86.5% using them daily, 10.0% using them weekly, and only 0.7% not using them. Dedicated ICT laboratories were not widely used, with 57.5% not using them, 22.5% using them monthly, 16.0% using them weekly, and 4.0% using them daily. E-libraries were mainly used monthly by 43.3% of students, weekly by 36.7%, daily by 5.0%, and not at all by 15.0%. Google Classroom, E-mail, and YouTube were accessed at varying frequencies, with no single dominant pattern. The data revealed diverse utilization patterns among students, emphasizing the importance of catering to these varying preferences to enhance the digital learning experience.

### **Hypothesis Testing:**

Ho1: Online resources utilization has no significant influence on learning outcomes of undergraduates in the study.

One sample chi-square test was used to test the research hypothesis with corresponding response from the participant.

$$\chi^2 = \sum (O - E)^2 / E$$

Test statistic 385.453

Degree of freedom 3

Asymptotic sig. (2-sided test) .000

The null hypothesis (H1) stated that "Online resources utilization has no significant influence on learning outcomes of undergraduates in the area of the study." The chi-square test statistic (385.453) is very large, indicating a substantial difference between the observed and expected frequencies.

The degrees of freedom (3) indicate that this is a chi-square test with three categories or groups. The p-value of 0.000 is extremely small, well below the typical significance level of 0.05.

The null hypothesis (H0) was therefore rejected. The data provided strong statistical evidence that online resource utilization had a significant influence on the learning outcomes of undergraduates in the study area. The very small p-value (0.000) suggested that the observed differences between the groups were highly unlikely to have been due to chance alone.

This result indicated that there was a statistically significant relationship between online resource utilization and learning outcomes among the undergraduates in the specified area of study.

Therefore, the alternative hypothesis (HA) was accepted: Online resources utilization has a significant influence on learning outcomes of undergraduates in the study area.

### **DISCUSSIONS**

The study findings showed the variety of resources used, and the methods which students used in accessing online resources (Komar, 2020). The use of personal computers, smartphones/tablets, and university/college computer labs were the

primary methods for accessing online resources (Sobchenko, Dotsenko, Smolianiuk, 2025). Also highlighted was the frequency of usage among students. Corroborating this finding, Cheetham and Chivers, (2001) in Otemuyiwa (2023) noted that ICT resources together with computers, smartphones, Wi-Fi, printers, telephones, and the web among others are mostly believed to foster cooperative learning, give a lot of data and, through simulation, create advanced learning experiences that are easier to grasp. However, the foremost ICT tool employed in learning environments were square measure wireless portable computers, smartphones, and tablets.

Gasaymeh (2018) found that the most common ICT resources among students were portable computers and smartphones. Philip and Garcia (2015) indicated that the utilization of smartphones in class has an optimistic impact on students learning. Anne and Anne (2018) showed that among the many factors, some seem to dominate more: educator presence in online settings, interactions between students, teachers and content, and designed connections between online and offline activities as well as between campus-related and practice-related activities. Fasanmi and Adeyemi (2023) equally noted that institutional support and adequate funding are crucial for the effectiveness of online learning.

Further findings showed that a significant portion of respondents had a positive attitude toward online learning resources, indicating openness to digital materials. It also showed that they preferred online video content, and used ICT resources for communication, emphasizing the integration of real-time tools in online learning. This confirms the findings of Gambari, et al. (2010) in Otemuyiwa (2023) that lecturers and students in science-oriented fields exhibited a more favorable attitude towards the integration and utilization of ICT for teaching and learning compared to their counterparts in non-science-oriented disciplines. Baber (2020) in line with this also noted that interaction in the classroom, student motivation, course structure, instructor knowledge, and facilitation are positively influencing students' perceived learning outcome, and student satisfaction.

The study through the tested hypothesis indicated a relatively positive influence of online resources on learning outcomes. This is in line with Gasaymeh (2018), who found that the adoption, and implementation of e-learning among tertiary institution students reflected a growing awareness of technological advancements, leading to improved attitudes towards e-learning, and enhanced proficiency in basic technology skills, ultimately benefiting their learning experiences. This was further supported by the findings of Egoeze et al. (2018) who reported that the rate of knowledge acquired in ICT increased as the undergraduates in university progressed in their academic pursuits.

This was further supported by the findings of Bagdasarov et al. (2017), who noted that ICT can play various roles in the teaching and learning processes. Such roles as impacting great potential to enhance student achievement, and teacher learning; playing a significant part in supporting face-to-face learning in the classroom; helping students to become knowledgeable, reducing the amount of direct instruction given to them, and providing academics the chance to attend students with explicit needs or who require attention. Also, Romeo (2006) noted that ICT resources assist students in their learning by improving their skills, motivation, and knowledge, and help them to complete learning tasks.

## CONCLUSION

The study underscores the significance of online learning resources in higher education. The findings established that online resources have a positive, significant influence on learning

outcomes for undergraduates. Based on the findings of this study, it is recommended that given the widespread use of mobile devices, institutions should optimize online resources and platforms for mobile access. This means ensuring that the content, and interfaces are responsive, and well-suited for smaller screens, providing a seamless learning experience for students who prefer to access materials on their smartphones and tablets. Similarly, to cater for the diverse preferences of students, institutions should offer a wide range of online resources. This includes multimedia content, electronic journals (E-journals), e-textbooks, and e-libraries. Providing a variety of resources allows students to choose materials that best suit their learning styles, and needs.

Furthermore, real-time collaboration tools, such as video conferencing and chat platforms, are essential for group discussions, collaborative projects, and virtual meetings. Institutions should continue to invest in, and support these tools, as they foster engagement and interaction among students and educators. Recognizing that the impact of online resources on learning outcomes can vary among students, institutions should offer tailored support. This might involve providing additional resources or assistance to students who require it, ensuring that each student can succeed in the online learning environment. Lastly, institutions should regularly assess the effectiveness of their online resources, and platforms. Gathering feedback from students is crucial to identify areas that need improvement.

Continuous evaluation allows institutions to make necessary adjustments, and enhancements to provide the best possible online learning experience. Educators should be trained to effectively utilize online resources, and create engaging digital content. This training ensures that faculty can adapt to the changing landscape of education, and deliver high-quality online instruction that aligns with student preferences and needs. Equally, there is the need for regulations and policies on the use of online resources to ensure that students use them responsibly and productively. These findings and recommendations can guide educational institutions in improving the accessibility and quality of online resources to enhance the students' educational experience and outcomes.

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## CONFLICT OF INTEREST

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## REFERENCES

- Achampong, E. K. (2012). Gender Difference in Information and Communication Technology Use among University Students. *Journal of Information Technology and Application in Education*, 1(4), 207–210. <https://www.airitilibrary.com/Article/Detail?DocID=P20150611010-201212-201507310017-201507310017-207-210>

- Ajebelen, A. (2016). The use of ICT to enhance university education in Nigeria. *International Journal of Education, Learning, and Development*, 4(5), 1–11. <https://ejournals.org/ijeld/vol-4-issue-5-june-2016/the-use-of-ict-to-enhance-university-education-in-nigeria/>
- Amaoge, D., & Ejike, U. (2016). Assessment of internet awareness and use by the undergraduates of College of Agricultural and Science Education at the Michael Okpara University of Agriculture Umudike. *American Journal of Educational Research*, 4(2), 200–203. <https://pubs.sciepub.com/education/4/2/8>
- Apagu, V. V., & Wakili, B. A. (2015). Availability and utilization of ICT Facilities for teaching and learning of vocational and technical education in Yobe State Technical Colleges. *American Journal of Engineering Research (AJER)*, 4(2), 113–118. <https://doi.org/10.12691/education-9-1-1>
- Attuquayefio, N. S., & Addo, H. (2016). Gender and age comparison of information communication and technology usage among Ghanaian higher education students. *American Journal of Information Systems*, 4(1), 1–6. <https://doi:10.12691/ajis-4-1-1>
- Ayub, A. F., Hamid, W. H., & Nawawi, M. H. (2014). Use of the internet for academic purposes among students in Malaysian institutions of higher education. *The Turkish Online Journal of Educational Technology*, 13(1), 232–241. <https://files.eric.ed.gov/fulltext/EJ1018186.pdf>
- Babalola, T. (2016). Postgraduate Students' access to and self efficacy in information and communication technology utilization for research in Southwest Nigeria. [Ph.D. thesis, University of Ilorin]. The Department of Science Education, University of Ilorin, Nigeria.
- Badau, K. M., & Sakiyo, J. (2013). Assessment of ICT teachers' competence to implement the new ICT curriculum in northeastern Nigeria. *Journal of Education and Practice*, 4(27), 10–21. <https://www.iiste.org/Journals/index.php/JEP/article/viewFile/9877/10098>
- Bagdasarov, Z., Yupeng, L., & Wuet, W. (2017). The influence of tablet-based technology on the development of communication and critical thinking skills: an interdisciplinary study. *Educational Technology Research and Development*, 49(4), 55–72. <http://dx.doi.org/10.1080/15391523.2017.1293576>
- Cheetham, G., & Chivers, G. (2001). How professionals learn in practice: An investigation of informal learning amongst people working in professions. *Journal of European Industrial Training*, 25(5), 248–292.
- Duță, N., & Martínez-River, O. (2015). Between theory and practice: the importance of ICT in higher education as a tool for collaborative learning. *The 6th International Conference Edu World 2014 "Education Facing Contemporary World Issues", Procedia – Social and Behavioral Sciences*, 180, 1466–1473. Elsevier Ltd. <https://doi.org/10.1016/j.sbspro.2015.02.294>
- Ebrahim, E. A. (2016). Assessment of information communication technology (ICT) usage in sciences education at Debre Tabor University, Ethiopia. *Journal of Multidisciplinary Engineering Science Studies (JMESS)*, 2(4), 413–416. <https://www.jmess.org/wp-content/uploads/2016/05/JMESSP13420084.pdf>
- Egbedokun, A., & Oyewusi, L. (2014). Towards the use of information and communication technology in undergraduates learning: Possession, perception, and problems in

- Obafemi Awolowo University, Ile-Ife, Nigeria. *World Journal of Education*, 4(2), 50–57. <https://doi.org/10.5430/wje.v4n2p50>
- Egoeze, F., Misra, S., Maskeliūnas, R., & Damaševičius, R. (2018). Impact of ICT on universities administrative services and management of students' records: ICT in university administration. *International Journal of Human Capital and Information Technology Professionals (IJHCITP)*, 9(2), 1–16. <https://doi.org/10.4018/ijhcitp.2018040101>
- Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. *Computer & Education*, 64, 175–182. <https://doi.org/10.1016/j.compedu.2012.10.008>
- Fabunmi, F. A. (2012). Undergraduate students' perception of the effectiveness of ICT use in improving teaching and learning in Ekiti State University, Ado-Ekiti, Nigeria. *International Journal of Library and Information Science*, 4(7), 121–130. <https://academicjournals.org/journal/IJLIS/article-full-text-pdf/4F4C6025393>
- Fasanmi S. A. & Adeyemi A. T. (2023). Assessment of the readiness of institutions and undergraduates' attitude to online learning mode in Nigerian universities. *Advances in Research*, 24(5), 149–162. <https://doi.org/10.9734/air/2023/v24i5966>
- Gasaymeh, A. (2018). A study of undergraduate students' use of information and communication technology (ICT) and the factors affecting their use: A developing country perspective. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(5), 1731–1746. <https://doi.org/10.29333/ejmste/85118>
- Komar, O. (2020). European Experience of the Use of Information and Communication Technologies in Initial Education of the English Language Teachers. *Educational Challenges*, 25(1), 55–67. <https://doi.org/10.34142/2709-7986.2020.25.1.05>
- Leonard, A., & Snyman, M. (2019). E-books: Yes or no? A case study of undergraduate students at the University of Namibia. *Collection and Curation*, 38(3), 78–88. <https://doi.org/10.1108/CC-08-2018-0018>
- Nortvig, A. M., Petersen, A. K., & Balle, S. H. (2018). A literature review of the factors influencing e-learning and blended learning in relation to learning outcome, student satisfaction and engagement. *The Electronic Journal of e-Learning*, 16(1), 46–55. <https://files.eric.ed.gov/fulltext/EJ1175336.pdf>
- Ogwu, F. J., Ogwu, E. N., & Eyitayo, O. T. (2010). Computer proficiency among fresh undergraduate students of the University of Botswana: Implications for learning. In *Proceedings of the third IASTED*. <https://dx.doi.org/10.2316/P.2010.685-042>
- Ojeniyi, A., & Adetimirin, A. (2013). Gender influence on ICT use by undergraduates in two university libraries in Nigeria. *Academic Research Centre of Canada*, 62–71.
- Okwuchukwu, O. G. (2015). Access to and pattern of ICT use among undergraduate students of Nnamdi Azikiwe University, Awka-Nigeria. *SSRG International Journal of Humanities and Social Science*, 2(1), 1–11. <https://www.internationaljournalsssrg.org/IJHSS/2015/Volume2-Issue1/IJHSS-V2I1P101.pdf>
- Otemuyiwa O. A. (2023). *Assessment of the utilisation of online resources and the influence of learning outcomes of undergraduates*. [Unpublished long essay in Bachelor of Arts Education].

- Payal, & Kanvaria, K. V. (2018). Learning with ICT: Use & barriers from teachers' perceptions. *International Journal of Recent Scientific Research*, 9(1), 23545–23548. <http://dx.doi.org/10.24327/ijrsr.2018.0901.1489>
- Philip, T. M., & Garcia, A. (2015). Schooling mobile phones: assumptions about proximal benefits, the challenges of shifting meaning, and the politics of teaching. *Educational Policy*. 29(4), 676–707. <https://doi.10.1177/0895904813518105>
- Romeo, G. I. (2006). Engage, empower, enable: Developing a shared vision for technology in education. In D. Hung, & M. S. Khine, (Eds.), *Engaged Learning with Emerging Technologies*. (pp. 149–175) Springer, Dordrecht. [https://doi.org/10.1007/1-4020-3669-8\\_8](https://doi.org/10.1007/1-4020-3669-8_8)
- Samuel, N. (2016). *Perception of university lecturers on the use of mobile technologies for research collaboration in southwest Nigeria*. [Unpublished doctoral dissertation, University of Ilorin]. Department of Educational Technology, University of Ilorin, Ilorin, Nigeria.
- Serumu, I. (2016). Assessment of human and material resources for the teaching and learning of woodwork in Delta State technical colleges [Unpublished master's thesis]. Delta State.
- Sobchenko, T., Dotsenko, S., & Smolianiuk, N. (2025). Mobile learning in the implementation of educational programs for training at the tertiary level: The national aspect. *Educational Challenges*, 30(1), 53–73. <https://doi.org/10.34142/2709-7986.2025.30.1.04>