

Adoption and Management of ICT in Schools: Strategies for the Administrators in Nigerian Tertiary Institution

*Dr. Felicia Olufunke, Agbesanya¹, Dr. James Oladiipo Folorunso², Dr. Adedayo Adeniran Odunlami³

^{1,2,3}Department Of Educational Management, University of Ilesa, Osun State

Corresponding Author*

DOI : <https://dx.doi.org/10.47772/IJRISS.2024.807220>

Received: 21 June 2024; Revised: 13 July 2024; Accepted: 17 July 2024; Published: 19 August 2024

ABSTRACT

It is no longer contestable that the emergence of Information Communication Technology (ICT) over the years has revolutionized all spheres of life. In the realm of education, appropriate utilization of ICTs has gradually altered the traditional teaching methods in most climes, thereby making teaching-learning more interesting and administrative work less complex. Nevertheless, the level of adoption of ICT in tertiary institution in Nigeria appear abysmally low resulting from factors resident in personnel and the education system. This paper therefore explores the spheres of ICT application in tertiary institutions of learning to include learning and teaching, research and collaboration, administrative efficiency, professional development among others. Constraints and considerations in adopting ICT were equally exposed to encompass data security and privacy concerns, technical challenges, poor implementation. Strategies for optimum adoption and integration of ICT by administrators of tertiary institutions in Nigeria. It was recommended among others that management should address the perennial problem of irregular power among others.

Keywords: ICT, Tertiary Institution, School Administrator, university administrators, administrative efficiency.

INTRODUCTION

In Nigeria, adoption and usage of ICT in educational institution has shown promising results across various level of education. Studies emphasize the positive impact of ICT on diverse disciplines, highlighting its potential to enrich students' learning experiences, increase interest in the instructional activities, and improve attitudes towards knowledge acquisition (Umar&Musa,2022). For instance, in the teaching of English language, Computer-Mediated Communication (CMC) has been found to boost students' confidence, online engagement, and overall learning outcomes, advocating for its encouragement and adoption in educational settings (Saidu, 2022).

Furthermore, at the basic education level, research underscores the necessity of ICT tools for effective English language teaching in junior secondary schools, recommending measures such as ICT literacy certification for teachers and facilitating access to computers for both educators and learners (Gomina,2022). Additionally, the post-Covid-19 era has seen a significant positive effect of ICT adoption on teaching and learning in Nigerian schools, particularly in mitigating challenges like overcrowded classrooms and enhancing teacher preparedness, emphasizing the need for curriculum revisions to further leverage ICT for improved education outcomes (Chinenye, Stanley, &Okezie, 2022). Ultimately, the appropriate utilization of ICTs has the potential to revolutionize traditional teaching methods, making teaching-learning more engaging and concrete in Nigerian educational institutions (Adesola, 2022). Nevertheless, the level of adoption of ICT in tertiary institution in Nigeria appear abysmally low.

OBJECTIVES OF THE STUDY

The objective of this paper is to explore:

1. the spheres of ICT application in tertiary institutions of learning and point out the digital platform relevant to each of the sphere
2. constraints and considerations in adopting and managing ICT, and
3. strategies for optimum adoption and integration of ICT by administrators of tertiary institutions in Nigeria.

SPHERES OF ICT APPLICATION IN TERTIARY INSTITUTIONS OF LEARNING

The adoption of Information and Communication Technology (ICT) in tertiary institutions has become a critical factor in enhancing educational delivery, administration, and research. Here are some key aspects of this adoption

- A. Enhanced Learning and Teaching:** Information and Communication Technologies (ICT) play a crucial role in enhancing teaching and learning processes across various educational settings. Studies emphasize the benefits of integrating ICT tools in education, such as improving student performance, developing critical thinking skills, and creating more engaging learning environments (Senad& Emir, 2023). The use of ICT in teaching not only facilitates the acquisition of 21st-century skills but also addresses the challenges faced in traditional teaching methods, making the learning process more dynamic and interactive (Valerio, 2023).

By leveraging technologies like computers, projectors, and the internet, educators can create more interesting and productive classrooms, enabling self-paced learning and better communication between teachers and students (Nasim& Sarkar, 2023). Overall, the integration of ICT in education is essential for promoting student success, enhancing teacher effectiveness, and fostering a more engaging and efficient learning environment. Concisely, ICT enhance teaching and learning by means of:

1. **E-learning Platforms:** Universities and colleges have implemented Learning Management Systems (LMS) like Moodle, Blackboard, and Canvas to facilitate online learning. These platforms provide tools for content delivery, student assessment, and collaboration.
 2. **Digital Classrooms:** The integration of ICT has led to the development of smart classrooms equipped with interactive whiteboards, projectors, and other digital tools that enhance the teaching and learning experience.
- B. Research and Collaboration:** The integration of Information and Communication Technology (ICT) in research processes is crucial for enhancing outcomes in various fields. Studies have shown that factors influencing the successful integration of ICT in research work include digital skills, digital flow, anxiety in ICT use, digital ethics, quality of digital resources, and behavioral intention (Francisco, Guillén-Gámez, Ruiz-Palmero& Gómez, 2023). Additionally, the real use of ICT among high school students has been found to positively impact their academic activities and collaborative skills, emphasizing the importance of integrating technology beyond mere communication into daily educational processes (Neha &Sharad, 2023).

Furthermore, research indicates that ICT tools are extensively utilized by students and researchers to enhance educational and research outcomes, underscoring the potential of ICT in alleviating stress and boosting academic performance according to Balol (2023). The influence of ICT applications on collaborative learning has been examined, demonstrating the significant role of ICT in bolstering collaborative learning settings and enhancing language proficiency among students. The increasing trend of publications on ICT in mathematics education has been observed, with a particular emphasis on topics such as "memory assistance," "efficacy," and "grades," signaling promising avenues for further exploration in this domain as noted by Natalia & Svetlana (2022).

Access to Digital Libraries and Databases: Information and Communication Technology (ICT) empowers students and educators to tap into a wide range of academic materials and research repositories, nurturing a more research-focused atmosphere conducive to scholarly endeavors. **Collaboration Tools:** Various platforms like Google Scholar, ResearchGate, and academic social networking sites serve as facilitators of collaboration and knowledge exchange among researchers on a global scale, fostering a vibrant scholarly community.

- C. Administrative Efficiency:** The pivotal role of Information Communication Technology (ICT) in enhancing administrative efficiency across diverse sectors has been underscored in studies from regions such as Nigeria,

Japan, and Tanzania, highlighting the positive outcomes of ICT integration in administrative functions as emphasized by Abdul-Razak (2023). The incorporation of electronic administrative methodologies like enterprise content management and document management systems has shown a strong correlation with enhanced organizational efficiency, resulting in cost savings and improved service delivery quality according to Nwinyokpugi & Dornanu (2022).

Challenges such as insufficient budget allocations, lack of standardized ICT infrastructure, and unreliable internet connectivity pose obstacles to realizing the full potential of ICT in administrative processes as identified by Takafumi, Miki & Daisuke (2022). Recommendations put forth entail investments in standardized ICT infrastructure, provision of training for personnel, and promotion of innovative ICT solutions tailored to specific administrative requisites in line with suggestions from Qing (2021). Summarily, leveraging ICT effectively can optimize administrative operations and contribute to overall efficiency and effectiveness.

Student Information Systems (SIS): These systems manage student data, academic records, and administrative processes, making administration more efficient and reducing paperwork.

Online Admissions and Registrations: ICT tools streamline the admissions process and course registrations, making them more user-friendly and accessible.

D. Distance and Blended Learning: Information and Communication Technologies (ICTs) play a crucial role in shaping modern educational practices, particularly in the context of distance and blended learning. Studies emphasize the significance of cloud-based ICTs in higher technical education institutions, highlighting their role in facilitating blended learning models that integrate traditional, online, and mobile technologies (Rashevskaja & Nataliia, 2023). Long, Manteng and Song (2022) opined that the impact of virtual education during the pandemic underscores the need for effective techno-pedagogical designs and teacher training programs to bridge the gap between institutional proposals and actual practices in utilizing ICTs for teaching.

Marina (2021) had earlier posited that the global shift towards Education 4.0 emphasizes the pivotal role of technology in reshaping educational paradigms, with blended learning emerging as a standard approach that combines classroom and online modes, leveraging ICT tools for enhanced engagement and success in online teaching. Furthermore, best practices in distance and blended learning models, informed by experiential learning theories, are essential for adapting to the new educational landscape prompted by the COVID-19 pandemic, emphasizing learner-centered approaches and innovative pedagogical strategies (Maisa, 2021). Theoretical discussions on distance and blended learning underscore the importance of digital tools and effective online learning strategies, highlighting the roles of teachers and students in leveraging ICTs for successful crisis learning scenarios (Andrea, & Judit, 2021).

Distance Education: ICT has made it possible for institutions to offer distance education programs, allowing students from remote areas to access quality education.

Blended Learning Models: A combination of online and face-to-face learning, enabled by ICT, provides flexible learning opportunities and caters to diverse learning needs.

E. Professional Development: Information and Communication Technologies (ICT) play a crucial role in enhancing academic staff professional development by providing tools for continuous learning and innovation (Sotonye, 2021 and Kariyeva, 2022). The integration of digital competencies through training programs like Digital Technologies in Teaching can significantly improve faculty members' readiness to implement educational innovations (Suvrajeet, 2022). Moreover, the impact of technological globalization on academic staff development in tertiary institutions highlights the importance of aligning with ICT advancements for improved academic outcomes.

Recognizing the need for a dynamic approach to academic staff development, especially in the face of rapid globalization, emphasizes the importance of incorporating ICT skills to adapt to the evolving educational landscape and meet the demands of the modern information society (Ivala, 2016). By leveraging ICT tools and resources, academic staff can enhance their professional competence and contribute effectively to the educational

process.

Online Training and Workshops: Faculty and staff can participate in professional development through webinars, online courses, and virtual workshops.

Continuous Learning: ICT promotes continuous learning and skill development, which is essential in adapting to the evolving educational landscape.

F. Communication and Community Building: ICT, as delineated by Jessen (2022), plays a pivotal role in enriching university community engagement through the facilitation of timely and efficient information sharing among universities, farmers, and various stakeholders. Jessen (2022) highlights the significance of ICT in fostering closer working relationships between universities and smallholder farming communities by providing real-time information through models like the Multi-Channel ICT-based Model. This model, as described by Bloomberg (2020), can significantly enhance university engagement with smallholder farmers, thereby enabling effective access to vital knowledge for improving farming practices.

Moreover, the integration of suitable technologies such as mobile technology, wireless technology, and cloud computing in e-learning, as emphasized by Jessen (2022), can support participatory engagement activities within the university community, leading to enhanced interactive learning experiences and the achievement of desired learning outcomes for learners. Effectively leveraging ICT tools, as highlighted in the literature, enables universities to bridge the information gap, empower smallholder farmers, and reinforce their engagement with the broader community.

In the realm of virtual communication platforms, revolutionary tools like Zoom, Microsoft Teams, and Slack have transformed communication within institutions by enabling virtual meetings, discussions, and collaborations. These platforms have become indispensable for fostering seamless communication and collaboration among stakeholders within higher education settings. Furthermore, institutions harness the power of social media and networks for communication, community building, and engagement with students, alumni, and various stakeholders. Social media platforms serve as valuable tools for institutions to maintain connections, disseminate information, and cultivate a sense of community among their diverse audiences.

CONSTRAINTS AND CONSIDERATIONS IN ADOPTING ICT

When it comes to the challenges and considerations in adopting and managing ICT in higher education institutions, it is essential to acknowledge the myriad of advantages that integration brings, while also recognizing the obstacles it presents. The complexities involved in effectively incorporating ICT into existing institutional structures require careful planning, resource allocation, and ongoing support to ensure successful implementation and utilization. Addressing issues such as digital literacy, infrastructure constraints, data privacy, and security concerns is paramount in navigating the landscape of ICT integration in higher education. Therefore, a comprehensive understanding of these challenges and considerations is crucial for institutions seeking to harness the full potential of ICT for enhancing teaching, learning, and community engagement. The following are some of the primary challenges encountered in this context as documented by Umar & Musa, (2022); Natalia & Svetlana, (2022); Saidu, (2022); Chinenye, Stanley, & Okezie, (2022); and Senad & Emir, (2023)

Data Security and Privacy Concerns: The increased utilization of information and communication technology (ICT) exposes educational institutions to various cybersecurity threats, such as hacking, data breaches, and ransomware attacks, which can compromise sensitive information like student and staff records. Safeguarding this data poses a significant challenge that requires the implementation of robust data protection measures to ensure the confidentiality and integrity of the information stored within the systems.

Furthermore, Technical Challenges may emerge during the integration of new ICT systems with existing legacy systems, often necessitating extensive customization to ensure compatibility and seamless operation. Additionally, providing adequate technical support to address any operational issues that may arise and to guarantee the smooth functioning of ICT systems can be a complex and resource-intensive task that demands careful attention and expertise.

Moreover, the lack of comprehensive Training and Development programs for faculty, staff, and students can hinder the effective adoption and utilization of ICT within educational settings. The ever-evolving nature of technology highlights the need for continuous learning and professional development initiatives to keep individuals updated on the latest advancements and best practices in utilizing ICT tools and resources effectively.

Inadequacies in Policy and Governance structures related to ICT can lead to inconsistencies and inefficiencies in its implementation within educational institutions. Achieving compliance with both national and international regulations concerning data protection and ICT usage presents a multifaceted challenge that requires careful planning and adherence to legal and ethical guidelines to safeguard sensitive information and ensure responsible ICT practices.

Moreover, the Digital Divide stemming from disparities in access to digital devices and high-speed internet connectivity can result in unequal opportunities and benefits derived from ICT, particularly affecting marginalized groups and individuals with disabilities. Addressing these inequities and ensuring inclusivity in ICT initiatives is crucial for promoting equal access and participation for all members of the educational community.

Effective Change Management strategies are essential for facilitating the transition from traditional methods to ICT-based processes within educational institutions. Engaging all stakeholders, including faculty, staff, and students, in the change process is vital for building consensus, gaining support, and ensuring the successful integration of ICT solutions into the institutional framework.

Financial limitations pose a significant obstacle in the implementation of Information and Communication Technology (ICT) infrastructure, which includes hardware, software, and network components. The initial investment required for setting up such infrastructure can be quite substantial and may deter institutions from pursuing technological advancements. Furthermore, the continuous need for financial resources to support maintenance, upgrades, and technical assistance adds to the financial constraints faced by educational organizations. Sustaining the ICT infrastructure over time requires a consistent flow of funds, emphasizing the importance of financial planning and resource allocation in ensuring the longevity of technology integration.

Resistance to change presents a formidable challenge in the realm of ICT adoption within educational settings. Cultural barriers among faculty, staff, and students can impede the acceptance of new ICT practices, as individuals may be hesitant to deviate from established routines and processes. Moreover, skill gaps among academic and administrative personnel can further complicate the effective utilization of emerging technologies, highlighting the need for targeted training and development programs to bridge these gaps effectively. Addressing resistance to change necessitates a comprehensive approach that considers the diverse perspectives and capabilities of stakeholders involved in the ICT integration process.

Infrastructure limitations act as a hindrance to the seamless integration of ICT within educational institutions. Insufficient high-speed internet connectivity and unreliable power supply are common challenges that impede the efficient operation of ICT systems. Additionally, scalability issues may arise when existing infrastructure is unable to support the increasing demands placed on technological resources. Overcoming infrastructure limitations requires strategic planning, investment in upgrading essential facilities, and ensuring the sustainability of ICT operations through robust infrastructure development initiatives.

Evaluation and feedback mechanisms play a crucial role in assessing the impact of ICT integration on academic and administrative processes. However, evaluating the effectiveness of ICT initiatives can be complex due to the diverse range of factors influencing their outcomes. Establishing mechanisms for continuous feedback and improvement is essential for identifying areas of improvement and maximizing the benefits derived from ICT implementation. By fostering a culture of evaluation and feedback, educational institutions can enhance their ICT strategies, address potential challenges, and optimize the use of technology in supporting teaching and learning activities.

STRATEGIES FOR INTEGRATING ICT IN UNIVERSITY ADMINISTRATION

Integrating Information and Communication Technology (ICT) in university administration requires a

multidimensional approach encompassing factors like technology, curriculum, pedagogy, institutional readiness, lecturer competence, and long-term financial planning (Muslimov, & Usman, 2023). To enhance the effectiveness of ICT implementation, universities must address technical and non-technical challenges such as poor connectivity, unstable power supply, and lack of training (Oreku, 2021; and Precious & Taisir 2022). Strategies should focus on creating an integrated academic system that streamlines educational processes, supports decision-making, and improves administrative services (Chopra, 2021). Integrating Information and Communication Technology (ICT) in university administration can yield profound effects on the efficiency, accuracy, and accessibility within the academic setting, as highlighted by Nwinyokpugi & Dornanu (2022).

The integration of ICT in this particular domain possesses the potential to bring about notable enhancements across various facets of administrative procedures. One pivotal approach to take into account involves the establishment of a supportive infrastructure for facilitating ICT integration. This encompasses making investments in a resilient IT infrastructure that encompasses components like high-speed internet connectivity, dependable servers, and secure data storage solutions, all of which are indispensable for ensuring the seamless functioning of digital platforms. Furthermore, the utilization of cloud computing services has the capacity to provide adaptable and versatile storage and processing capabilities, thereby augmenting the overall efficiency of administrative duties.

Furthermore, a critical area that warrants attention is the refinement of administrative frameworks through the deployment of sophisticated technologies. The incorporation of Enterprise Resource Planning (ERP) systems can be instrumental in harmonizing and overseeing fundamental administrative operations such as financial management, human resource allocation, and student data management in an efficient manner, as proposed by Gomina (2022). Moreover, the deployment of Learning Management Systems (LMS) can rationalize the handling of educational materials, student assignments, grading processes, and communication channels within the academic sphere.

Efficient handling of data and leveraging analytics represent crucial components to take into consideration when incorporating ICT into university administration. The establishment of a centralized repository to house and regulate student records, faculty particulars, and administrative data can bring about significant enhancements in data accessibility and organization, as suggested by Adesola (2022). Additionally, the integration of data analysis tools empowers informed decision-making processes grounded on variables such as student performance metrics, enrollment patterns, and resource distribution strategies.

Communication and collaboration tools play a crucial role in facilitating efficient interaction within the academic community. Standardizing communication channels through email and messaging platforms for both staff and students can enhance overall connectivity (Bloomberg, 2020). Furthermore, leveraging collaboration tools such as Microsoft Teams, Slack, or Zoom can improve meeting efficiency, project collaboration, and support remote work arrangements.

Automation and workflow optimization play a crucial role in enhancing efficiency and productivity within university administration. Strategies such as automating repetitive tasks like payroll processing, admissions, and course registration through technologies like Robotic Process Automation (RPA) can result in significant time savings and efficiency improvements. Moreover, the development of digital workflows for activities such as document approvals, feedback processes, and administrative tasks can decrease manual labor and expedite overall processes in university administration, as highlighted by Valerio (2023).

The importance of ensuring security and compliance in Information and Communication Technology (ICT) systems cannot be overstated, as it is vital for safeguarding sensitive data and upholding regulatory standards, as emphasized by Abdul-Razak (2023). The implementation of strong cybersecurity measures, including encryption, firewalls, and regular security audits, is essential to protect against potential threats. Furthermore, adherence to relevant laws and regulations such as the General Data Protection Regulation (GDPR) is necessary to uphold data privacy and protection standards.

Effective user training and support are critical for the successful integration of ICT tools and systems within university administration. Providing regular training programs for faculty, staff, and students can enhance their

proficiency in utilizing ICT resources, as noted by Rashevskva & Nataliia (2023). Establishing a dedicated IT support team to handle technical issues and offer troubleshooting assistance is imperative for ensuring smooth operations and user satisfaction.

The development of comprehensive ICT policies and the establishment of governance structures are vital for the seamless integration of ICT within university administration. Creating clear policies that govern the usage, data management, and security practices of ICT systems can promote consistency and compliance, according to Nasim & Sarkar (2023). Forming an ICT governance committee to supervise integration efforts, tackle obstacles, and align initiatives with the university's strategic objectives are essential for successful implementation and long-term sustainability.

Continuous improvement is crucial for maximizing the advantages of ICT integration in university administration. By implementing feedback mechanisms to collect user input on system effectiveness and areas for improvement, ongoing enhancements can be achieved, as outlined by Francisco, Guillén-Gámez, Ruiz-Palmero & Gómez (2023). Regularly evaluating and updating ICT systems to incorporate new technologies and best practices ensures that the university remains at the forefront of technological advancements and sustains operational efficiency.

Integrating ICT with academic functions can further enhance the overall educational experience within the university setting. Utilizing ICT tools such as Research Management Systems can streamline research project management, grant applications, and publication records (Takafumi, Miki & Daisuke, 2022). Additionally, leveraging e-Learning platforms and virtual classrooms can facilitate online learning through webinars, digital resource libraries, and interactive learning environments, thereby expanding educational opportunities and accessibility for students.

CONCLUSION

The challenges and considerations for integrating ICT in Nigeria tertiary institutions are enormous. However, the prospects and transformation that follows makes the adoption worthwhile. Inferably, the adoption of the suggested strategies by administrators could invariably help in surmounting the identified challenges and pave way for optimization of ICT facilities in the institutions.

RECOMMENDATIONS

The following recommendations were made:

1. Tertiary institution management should address the problem of irregular power supply
2. Conscious and concerted efforts should be placed on provision of ICT facilities
3. Administrators should upgrade their skills by embracing cloud computing in order to improve their efficiency.
4. Tertiary institution management should partner with relevant organizations to train their staff periodically.

REFERENCES

1. Abdul-Razak, A. (2023). The Effects of Information Communication Technology on Administrative Efficiency of Tamale Technical University. *American Journal of Industrial and Business Management*, doi: 10.4236/ajibm.2023.135025
2. Adesola, S. A. (2022). The Place of Information and Communication Technology in the Effective Teaching and Learning of History in the Nigerian Educational Institutions In The 21st Century. *International Journal of Educational Review*, doi: 10.33369/ijer.v4i2.23689
3. Andrea, T. & Judit, B. (2021). ICT-supported Learning: Concepts going viral. doi: 10.1109/SACI51354.2021.9465605
4. Balol, N. (2023). The Use of ICT to Encourage Student's Engagement with Collaborative Learning. *International journal of linguistics, literature and translation*, doi: 10.32996/ijllt.2023.6.2.6
5. Boniface, M. W., Nyambura, H. & Muriuki, N. (2022). An Analysis on the Effectiveness of ICT

- Integration In Learning in Higher Education Institutions in Covid-19 Era. *International Journal of Computer Applications Technology and Research*, doi: 10.7753/ijcatr1112.1009
6. Chinenye, D., Stanley, E. U. & Okezie, M. D. (2022). Ict adoption and effects on teaching and learning in post covid-19, Nigeria. *International Journal of Engineering Applied Sciences and Technology*, doi: 10.33564/ijeast.2022.v07i06.043
 7. Chopra, N. (2021). E-governance in Higher Education Institutions in India: Status and Prospects. doi: 10.32559/ET.2020.4.9
 8. Francisco, D., Guillén-Gámez, J., Ruiz-Palmero, M. & Gómez, G. (2023). Digital competence of teachers in the use of ICT for research work: development of an instrument from a PLS-SEM approach. *Education and Information Technologies*, doi: 10.1007/s10639-023-11895-2
 9. Gomina, K. (2022). ICT Needs Assessment for Teaching and Learning of English Language in Junior Secondary Schools in North Central Nigeria. *International Journal of Social Science and Education Research Studies*, doi: 10.55677/ijssers/v02i12y2022-15
 10. Ivala, E. (2016). Educational Technology Training: Staff Development Approaches. *International Journal of Embedded Systems*, doi: 10.1080/09751122.2016.11890493
 11. Jessen, N. (2022). Monitoring and evaluation mechanisms of community engagement initiatives in Universities of Technology in South Africa. doi: 10.51415/10321/3939
 12. Kariyeva, D. U. (2022). Exploring the academic staff development programme for newly appointed academic staff members in Universities of Technology : a systems approach. doi: 10.51415/10321/3920
 13. Karkuzhali, S. & Senthilkumar, S. (2020). Digital Transformation Using ICT Tools for Blended Teaching and Learning. doi: 10.1201/9780429276484-3
 14. Linda, D, Bloomberg. (2020). Developing a Learning Community Through an Online University's Community Engagement Platform: An Analysis of the Experiences of Students and Faculty. doi: 10.5281/ZENODO.3711101
 15. Long, Y., Manteng, K. & Song, L. (2022). ICT Self-Efficacy, Organizational Support, Attitudes, and the Use of Blended Learning: An Exploratory Study Based on English Teachers in Basic Education. *Frontiers in Psychology*, doi: 10.3389/fpsyg.2022.941535
 16. Maisa, M. (2021). Towards blended learning: Stakeholders' perspectives on a project-based integrated curriculum in ICT engineering education:. *Industry and higher education*, doi: 10.1177/0950422221994471
 17. Marina, P. D. (2021). ICT training strategies in a blended learning scenario. doi: 10.1109/JICV53222.2021.9600321
 18. Muslimov, N., A., Usman, I. B. (2023). E-Administration Usage for Service Delivery in Universities: Highlights of Selected Survey Findings. *African journal of social sciences and humanities research*, doi: 10.52589/ajsshr-vyofj4ky
 19. Nasim, A. & Sarkar, A. (2023). Enhancement teaching and learning process through the application of ICT in physical education. doi: 10.58914/ijyesspe.2022-7.1-2.5
 20. Natalia, M. & Svetlana, K. (2022). The use of information and communication technology (ict) in higher education: advantages and disadvantages. doi: 10.32840/1992-5786.2022.81.43
 21. Neha, L. & Sharad, K. S. (2023). Use of Information Communication Technology (ICT) in Library and Information Science Education and Research. doi: 10.14429/djlit.42.6.18371
 22. Nwinyokpugi, N.P. Dornanu, L. (2022). Civil Service Efficiency: Leveraging on Electronic Administration Tools. *African journal of law, political research and administration*, doi: 10.52589/ajlpra-jdqam9cd
 23. Obaa, B. (2016). Developing and piloting a multi-channel ICT-Enabled Model to enhance University engagement with smallholder farming communities in Uganda. *Journal of Rural and Development*, doi: 10.22004/AG.ECON.263572
 24. Oreku, G. S. (2021). Adopting the ICT Innovation to Administrative and Activity Procedures in a University. doi: 10.51986/IJER-2021.VOL3.02.07
 25. Precious, K. & Taisir, M. H. (2022). Review of the IT Integration Framework for a University's Institutional Performance Setting in Zimbabwe. *International journal of academic research in business & social sciences*, doi: 10.6007/ijarbss/v12-i1/12054
 26. Qing, G. (2021). Optimization of Administrative Efficiency and Educational Methods Based on Information Technology. doi: 10.1145/3456887.3457108

27. Rashevsk N., V. & Nataliia, M. K. (2023). Improving blended learning in higher technical education institutions with mobile and cloud-based ICTs. *Osvìtnijvìmir*, doi: 10.31812/ed.608
28. Saidu, Y. O. (2022). The Use of ICT for the Teaching and Learning of English as a Second Language in Nigeria: The "What", "Why", and "How". *South Asian research journal of arts, language and literature*, doi: 10.36346/sarjall.2022.v04i04.004
29. Senad, O.& Emir, S. (2023). ICT as a Didactic Tool to Facilitate the Learning Process in the Subject of Mathematics in Combined Classes. doi: 10.58806/ijirme.2023.v2i5n01
30. Sotonye, S. A. (2021). Technological Globalization and Academic Staff Development in Tertiary Institutions in Rivers State, Nigeria. *Journal of Education and Practice*,
31. Suvrajeet, S. (2022). Professional Accreditation Pathways in Higher Education: Enabler or Block to Technology-Enhanced Learning Professional Development?.doi: 10.1007/978-981-19-5587-7_6
32. Takafumi, S., Miki, M. &Daisuke, S. (2022). Study on efficient administrative management of local governments through interdisciplinary cooperation on smart city project. *Aij Journal of Technology and Design*, doi: 10.3130/ajjt.28.1420
33. Umar, A.,&Musa, S. (2022). ICT and Learning of Mathematics in Nigeria. doi: 10.58421/misro.v1i3.40
34. Valerio, T. E. (2023). Integrating ICT in Language Teaching and Learning. *Advances in higher education and professional development book series*, doi: 10.4018/978-1-6684-7275-0.ch016