

Transforming Teaching and Learning through ICT: The Role of Academic Staff in the New Normal

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ABSTRACT

Technology is fast reshaping the entire landscape of education and academics are charged with more responsibilities as they navigate through the new normal in education. The initial transformation which the ICT trend has brought to teaching and learning in educational institutions in scope and content, has made teaching a challenging profession where knowledge is expanding exponentially. It has also provided leverage for the sustained relevance of ICT in the transformation of teaching and learning, in this critical period in which the new normal has become inevitable to adopt. This paper therefore discusses the challenges and roles of academics in the new normal. Models of transformation were reviewed and a framework which provides approaches for transformation of teaching and learning through ICT in the new normal guided the study. It is recommended among others, that educational institutions establish a department of learning technology to support academics in their new functions, while ensuring the provision of relevant infrastructures to facilitate transformation of the teaching and learning process.

Keywords: *ICT, Emerging Technologies, Technology Competence, Operational Framework.*

INTRODUCTION

In contemporary society, Information and Communication Technology (ICT) is seen as an indispensable tool to fully transform teaching and learning. It is considered as an essential toolkit that affords new transformative models of development, that is, knowledge, learning, and competitive skills that help to navigate the new environment (Thomas *et al.*, 2016). The corona virus pandemic (COVID-19) has increased the demand for a shift in learning, from a formal classroom setting to technology aided teaching where emphasis has shifted from memory-based to inquiry-based learning. Thus, the digital transformation of teaching and learning around the world is progressing faster than ever. Looking ahead to the new normal, academics all over the world face major digital transformations which yearn for a lot of attention and new role play (Mitsuru, 2020). According to Kenechukwu & Oboko (2013), ICT includes all automated means of teaching with the aid of computers and web-related resources which has substantially affected instructional methods and techniques.

Transforming the teaching and learning processes in education has attracted a lot of policies and efforts. In Nigeria for instance, the development and use of ICT at all levels of education is gradually gaining ground, although the developmental pace is slow. This is compounded by a wider gap created by the COVID-19 pandemic, which craves more applications in the new normal. Reacting to the emerging phenomenon, Olele & Williams (2014) then reiterated that advancement of technology initiated by the digital revolution through technological innovations, has caused a paradigm shift in the way we do things of which the entire landscape of education is included.

The emerging technologies have changed educational institutions in both scope and content, making teaching a challenging profession where knowledge is expanding exponentially (Robinson & Latchem, 2003). Emerging technologies refers to innovative technologies that largely impact teaching and learning. According to Bozalek (2011), these are technologies that emerged to represent a new paradigm in education. Examples are virtual classrooms and laboratories, computer simulations, digital and mobile devices. Technology is enabling schools to take advantage of new opportunities, build new capabilities and improve efficacy as well as efficiency. The whole structure of the school, roles of academics as well as students have changed from the traditional and instructional classroom approach to digital aided teaching and learning. Hence, academics are expected to facilitate learning and make it meaningful to learners and, meet the challenges of teaching in the new normal. ICT transformational tools ranging from video conferencing through multimedia to web sites can be used by academics to facilitate delivery of instruction (Jung, 2005). It covers all emerging technologies that support teaching and learning activities. Academics have the enormous task of combining new technologies with effective pedagogy to address the new normal situation.

The goals of education change to reflect the needs of the society, making it imperative for new technologies to transform the teaching learning process. This made it imperative for intensive effort and attempts to go beyond integration, to transforming the teaching and learning process through ICT. This paper looks at different stages of digital transformation in teaching and learning through ICT use in higher institutions. These stages are reviewed within a framework which provides teachers with different and unique ways of handling the transformation challenges.

Model for Transforming Teaching and Learning through ICT

The paper is anchored on Welliver's Instructional Transformational Model. It highlights the systematic arrangement of information and communication processes along different stages from familiarisation to evolution to conceptualise and structure its use in teaching and learning. The continuum of these stages involves familiarisation, utilisation, integration, re-orientation, and evolution.

Welliver's instructional transformation model progresses through five stages, and it was developed to guide teachers, as well as allowing for maturity in their pedagogical use of ICT (Olele & Williams, 2014). It is a model that emphasises the transformation of teaching and learning through ICT with a process starting with familiarisation and ends in evolution. The model supports the use of technology in both the traditional setting of classroom instruction and contemporary setting of e-learning. In a similar dimension, some other authors (Majumdar, 2005; Anderson, 2010) considered the five stages of the instructional transformation model as a continuum of steps comprising emerging, applying, infusing, and transforming.

The familiarisation stage is also represented in the Mapped Model of ICT Integration as the emerging stage where the teacher supports work performance with ICT knowledge and skills. The teacher at this stage is expected to be aware of the different technologies as well as know their uses. The awareness also transforms to understanding basic technology concepts and skill acquisition to be able to move to the next stage. The role of academics at this stage is to design instructional activities using Technology, Pedagogical and Content Knowledge (TPCK).

The utilisation stage which is also termed the applying stage involves the actual usage of ICT knowledge and skills acquired in teaching and learning. This stage as depicted in Figure 1 focuses on utilising technology in the classroom for innovative tasks and activities. The success of this stage depends on understanding the implication of technology usage and provision of technical support to enhance ICT utilisation.

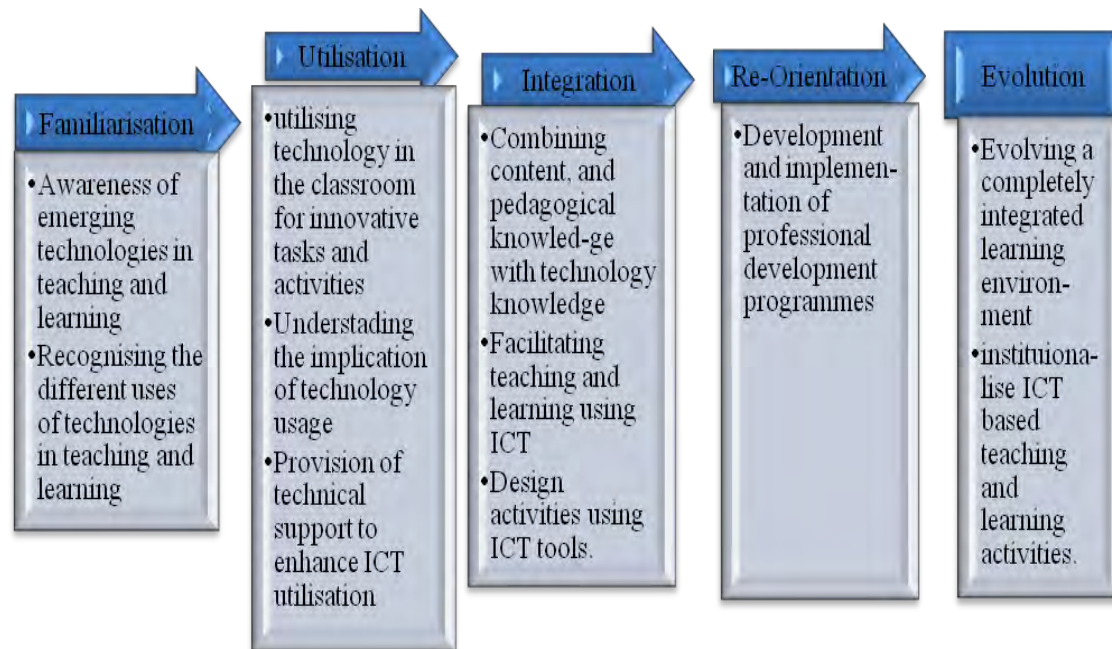


Figure 1: Welliver's Instructional Transformation Model

Note: Process-oriented instructional transformation model. From "Infusing educational technology into mainstream educational computing," by L. Rieber and P. Welliver, 1989, *International Journal of Instructional Media*, 16 (1), p. 24.

The integration stage or infusion stage involves combining content and pedagogical knowledge with technology to facilitate teaching and learning. The stage emphasises the availability, adequacy, and accessibility of ICT tools in the learning environment.

The re-orientation stage incorporates the need for implementation of professional development programmes (training). In the technology driven world, new technologies emerge, and the teacher must be abreast of them. In-service training is important at this stage as it is an ICT enabler. This training not only focuses on improving ICT skills but also provide academics with the opportunity of learning innovative ways of ICT in teaching and learning (Cubukcuoglu, 2013). Although in the Mapped Model of ICT integration, it was not emphasised, specialisation is the key to change and can be acquired at the re-orientation stage. The roles of ICT translate into learning skills in the use of new technological tools, and this stage affords teachers the opportunity to learn new concepts and skills in ICT. This will enhance their teaching capacity and they will be better equipped in the discharge of their duties, as well as bring about transformation.

The evolution or transformation stage is concerned with the act of evolving a completely integrated learning environment where teaching and learning through ICT becomes institutionalised. Increased complexity in the processes and global requirement for excellence demand more than ICT integration, thus, continuous improvement and innovation in processes and systems is required. The transformation stage ushered in a lot of innovations and creativity in

using ICT to teach and learn. While this stage keeps evolving in the face of emerging technologies, it is a progression in terms of assessment and reflection of ICT strategies and tools.

All the five stages in the instructional transformation model are relevant to the transformation in the new normal as academic staff are expected to design their instruction using technology. These transitional stages support the building of educational experiences around learning skills, which gives more leverage to the teaching and learning processes.

Transforming Teaching and Learning through ICT

ICT as denoted by its contents comprises information and communication facilitated by technology. Assan & Thomas (2012); Idumange (2008); and Thakur & Raghuvanshi (2016) described ICT as technological equipment used in the automatic acquisition, storage, manipulation, management, control, display, switching and transmission of information. ICT encompasses computer hardware and software, the networks, and other related devices (Nwabueze & Ukaigwe, 2015). It is the automation of processes, task and activities based on technology.

Transforming teaching and learning through ICT is the process of using innovative practices, strategies, and techniques, as well as creativity supported by ICT tools. Innovations are inevitable for sustaining the learning environment due to technological development. It allows for restructuring of the integration process and evaluation of performance of ICT integration in schools. The focus is on innovative ways of delivering instruction using new technological tools (email, Internet, Google, Facebook, Twitter, LinkedIn, You tube, Blackboard, Moodle, Google drive and forms, polling software and other software technologies). Olele & Williams (2014) described the transformation of teaching and learning as a process that involves the creation of dynamic ways of promoting student learning. It offers academics the opportunity of promoting pedagogy most especially with new technologies in a creative way to bring about meaningful changes in teacher and student engagement.

The conclusion from the study of Cubukcuoglu (2013) on the factors enabling the use of technology in subject teaching, showed that although ICT integration into teaching has grown rapidly over the past decade, its use is still at the infantile stage. While more academics are proficient in the use of ICT than in the past, they are scarcely utilised for instructional purposes. The reason adduced for this condition is that ICT skills are not being transformed into the instructional processes. The analytical judgement from the instructional transformational model is that the re-orientation stage is a preparatory stage or the transformation stage. In other words, at the transformation stage, academics are expected to put into use the new skills acquired at the re-orientation stage.

The framework for transforming teaching and learning through ICT based instructional delivery is shown in Figure 2. Transforming teaching and learning through ICT requires creative and innovative use of ICT tools and activities in three knowledge areas (content, pedagogy, and technology) affecting the curriculum of each subject. This further confirms the assertion of Olele & Williams (2014) that better use of technology by academics depends on the knowledge they possess. Koehler *et al.*, (2017) used the technological, pedagogic, and content knowledge (TPACK) framework to conceptualise the knowledge required to teach effectively. The TPACK framework explains the interaction between the domains of knowledge (content, pedagogy, and technology) and suggests that academics must understand them to transform teaching and learning processes. According to Olele & Williams (2014, p.20), “the knowledge base of academics must include technology, and they must be aware of their limitations”. In other words, they must recognise that they are not technology experts that master the technology hardware and software, but they are master of content and pedagogy and only need technology skills to

facilitate the teaching and learning processes. This is where transformation in terms of innovative use of technology tools becomes paramount. The framework as presented in Figure 2 also point to three approaches in transforming the teaching and learning through ICT, these include content creation, pedagogy deepening, and technology literacy.

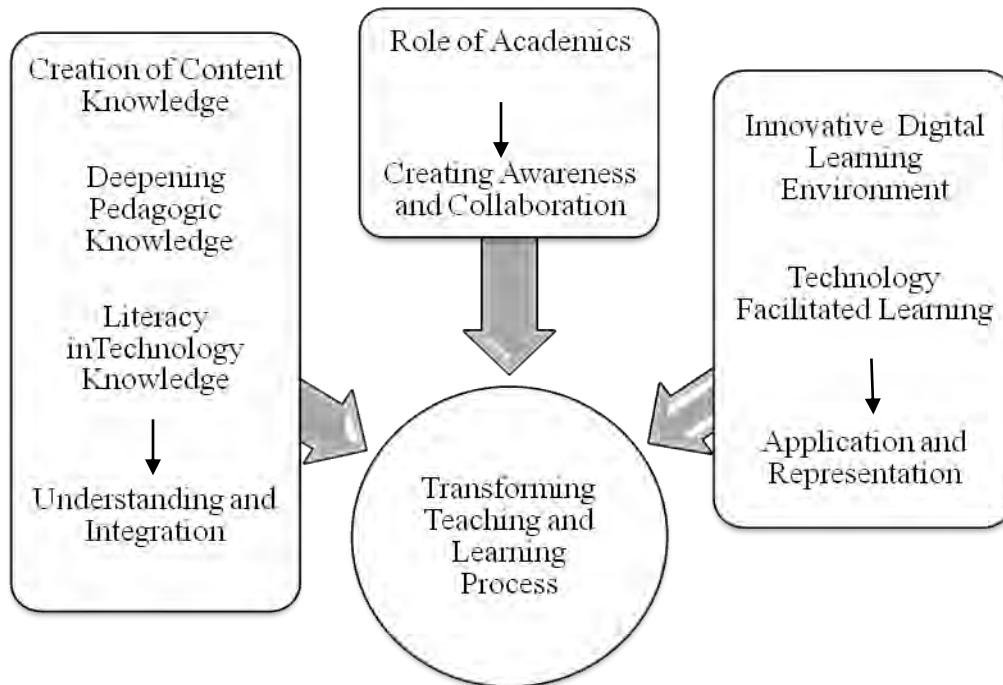


Figure 2: Framework for Transforming Teaching and Learning through ICT in the New Normal

The content creation approach focuses on the school curriculum and programmes. It involves continuous creation of knowledge and improvement of learning with an appreciable synergy which allows teachers to use technology to support student learning, to create new knowledge and activities. The pedagogy deepening approach concentrates on the use of constructivist, collaborative, reflective and integrative styles to navigate the learning environment using technology. The technology literacy approach refers to the ability to use contemporary skills in technology for instructional delivery of content created.

The Role of Academics in Transforming Teaching and Learning through ICT in the New Normal

ICT in education has greatly affected teaching and learning bringing in change and reforms. Academics as the main actors in the scheme of change are expected to transform schooling to learning. Their new roles include application, exploration, experimentation, and modelling of good practices in teaching. However, the question remains, how prepared are academics for the new roles ushered in by technology and probably the corona virus pandemic? In addition, these roles require that academics have a good understanding, attitude, and disposition. Koehler & Mishra (2009) acknowledged teaching as a complex and dynamic phenomenon in which academics have to practice their skills and constantly develop their understanding. It is also worthy to note that the transformation of the teaching and learning process involves innovations and creativity and these can be sustained by academics understanding and knowledge of applied technology. In addition there is need for academics to update their skills for the new roles.

The role of academics is vital to the growth and development of learners, thus in performing their task in the new normal they must redefine their methods of instructional delivery and embrace the role of initiator and creator of content, developer of knowledge and skills and promoter of competence. As a content creator, the needs of learners are adequately considered, and the curriculum is more practical and skill oriented. In this role, academics prepare a personalised curriculum that enables the learner to navigate beyond the classroom. It also highlights innovative methodologies where the academics become more personalised in the delivery mode that is based on case-demand.

ICT infrastructure and tools are not readily available, and, in some cases, there are problems of accessibility in schools, hence, academics will need to improvise in addition to knowing how, where, when and for what purpose to use technology for learning activities. Professionalism (skills and competence) is required to create alignment between content, teaching, assessment, and learning. This assertion was buttressed by Mitsuru (2020) who emphasised that academics in the new normal must possess core skills such as facilitating, interpersonal, digital, critical thinking, communication, innovative and adaptability skills for hybrid delivery of content and facilitating student learning.

Interestingly, in the new normal, academics are seen as team players in the teaching learning process. They become an integral part of the process that provides support structures for learners' experience and empowerment. The academic's role changed from being an instructor to constructor. This role is characterised by cognitive development (learner-centred) rather than behavioural development (teacher centred). The use of blended learning modality and development of learning modules will replace lengthy classroom lectures and teacher-driven discussions.

Grand-Clement (2017) characterised the digital context as learner centred where emphasis is on what is being received rather than what is being delivered. She reiterated that while technology can effectively transform the teaching learning process, it cannot replace the teacher. However, in the new normal, the role of the academic is to guide the learner to the source of knowledge rather than being the source of knowledge. In other words, their role is similar to that of intervention and mentoring, where they mediate to reduce digression, misunderstanding, misconception of content while equally ordering their thoughts, and challenging their imagination and creativity. This motivation will give learners the opportunity to be actively engaged in learning and connect with the learning environment.

The Challenges of Transforming Teaching and Learning through ICT in the New Normal

ICT have the potential to transform teaching and learning, providing opportunities for new content, knowledge, and methodologies, in addition to effective communication between academics and learners. However the task of using these emerging technologies in the teaching and learning process may be both complex and difficult (Glowatz & O'Brien, 2017) due to several challenges. Although there are concerted efforts and measures to address some of these challenges, especially in Nigeria, it is still equally important to highlight them as much is still required in the process of transformation.

Technology Literacy

The role of the academic has changed from being the sole knowledge provider with the emergence of digital literacy, as they must interact with students who are more literate in emerging technologies. Chuwuedo & Igbinedion (2014) and Nwokedi *et al.*, (2018) observed that most academics do not possess the required technology literacy to deal with both content and methodologies, and academics who are not equipped professionally and technically to handle

development of materials and instructional delivery will face a lot of setbacks, thus they require extensive skills development. For academics to effectively transform the teaching learning process, they need to do more than just develop new ICT skills. Soft skills are equally important, and they have to be pedagogy based (Loveless, 2011).

Complexities of Technology

A new technology may be obscure and unstable (Glowatz & O'Brien, 2017). This presents challenges to the users to use, most especially when it must be adapted to educational settings. Similarly, the reliability of technology and technical issues are of concern to the user. This refers to development issues such as the bugs, the speed, the errors, functions, and features not correctly working or does not work according to what academics require (Nurul *et al.*, 2015).

Access to ICT Resources

Accessibility of new technology is a complex challenge that has slowed down the pace of using ICT to transform the teaching and learning process. Loveless (2011) found that lack of access is the largest barrier facing academics. However, inaccessibility may not be due to non-availability of ICT resources. In some cases, what is available may be inappropriate or obsolete, leading to accessibility problems. Inconsistent access to ICT resources makes it extremely difficult for academics to integrate technology into their existing teaching and learning process (Johnson *et al.*, 2016).

Technical Support

Technical support for academics is lacking in comparison to the desire for transforming the teaching and learning process through ICT. According to Dziubar *et al.*, (2018), the demand and desire for the innovative response in the digital age has been met with insufficient investment in infrastructure and technological assistance. Prior to the COVID-19 pandemic and since, academics lack the necessary technical support to navigate the technology world in the new normal. Adapting emerging technologies to educational settings is a complex and time consuming process that should not be left to the academics, hence the need for professional and technical support. Technical challenges which range from website issues, connectivity, malfunctioning of digital tools to use of obsolete devices, often impede successful transformation of the teaching and learning process in schools.

Training

Bingimals (2009) in relating the different barriers indicated that one obstacle can lead to another. For example, access to ICT resources may be available, but lack of competence on the part of the academics is linked to inadequate training. Inadequate training in technology skills, soft skills and pedagogic skills often affects the use of ICT in teaching and learning (Dziubar *et al.*, 2018). Nwabueze & Ukaigwe (2015) argued that the professional development and training programmes offered to academics are commendable, but do not seem to address their present technological needs. There is a notable gap in current practices which rightly points to absence of training. The conclusion is that if the teaching and learning process will be transformed using ICT, academics who are the main actors need further exposure through training to overcome this challenge. As noted by Bingimals (2009) the challenge of inadequate training may result in lack of confidence and motivation on the part of academics.

Financial Resources

Non-availability or inadequacy of financial resources poses a great challenge to academics in their bid to function properly in today's technological world. Low levels of funding often lead to

lack of the hardware and software needed to integrate ICT in schools. Funding is an institutional support needed for ICT integration in schools. It is worth noting that affordability of technologies is also a major barrier and where funding is at the low ebb, the holistic process of transformation becomes difficult even in the space of demand.

Social and Behavioural Factors

Academics' attitudes, beliefs, desire, and perception are considered social and behavioural challenges that can affect the use of ICT in the teaching and learning process. The transformation process is complex and requires the competence and commitment of academics for successful implementation. In addition, the process requires innovation and creativity which can only be ushered in by the change process. Change is often faced with resistance, and this is the main challenge in adopting new technologies, especially in the new normal. However, academics' positive attitude to change will lead to confidence and competence, which are crucial factors in determining the effectiveness of the technology transformation process.

CONCLUSION

It is quite evident that there are new developments in the way new technologies are used in teaching and learning. The use of emerging technologies for educational purposes will increase in the new normal, however there is need to channel the benefits towards demands, requirements and the protruding gaps in education. It is to this extent that this paper discussed models of transformation and proposed a framework which encapsulates the approaches for transformation. Technological changes have moved the world forward and this requires everyone, including academics to embrace the change in their respective setting and roles. The framework was used to explain how the various approaches which ranges from content creation, pedagogy deepening to technology literacy, can be utilised to transform the teaching and learning processes in schools. The indication is that the transformation process which is imperative in the new normal is a mixed and complex task with lots of challenges. In other words, the way forward is not only the application of the model, approaches, and curbing strategies but also in response to reactive changes in different dimensions. There is need for critical innovations in planning and policy making, rigorous and relative teacher preparation, and creative curriculum emanating from the learning environment and stretching into the society.

RECOMMENDATIONS

1. It was noted in the paper that, the framework does not intend to make academics expert in technology hardware and software, but masters of content and pedagogy who only need technology skills to facilitate the teaching and learning processes. This means that academics should acquire knowledge and improve their skills in relevant and necessary new technologies that will be utilised in the teaching and learning process. Keeping abreast with the latest technology is always an advantage not only to academics but also the schools. Educational institutions should establish departments of learning technology to support academics in their new job roles.
2. Educational institutions should ensure the provision of relevant infrastructure to facilitate transformation of the teaching and learning process. There should be a network synergy between schools, educational technology researchers and educational software providers to resolve development issues as well users' concerns.
3. Government in partnership with other stakeholders should make provision for ICT facilities among academics and facilitate easy access for instructional enhancement.

- Institutions should also strive to provide ICT infrastructure, electricity and broadband access and multiple digital channels with networks.
4. There is need to technically support academics in operation scheduling difficulties. This is important for successful transformation, and it involves the provision of technical experts and functional technological resources. Institutions should also seek assistance from creators of educational technologies to offer support to intended users. Provision of technical support will help to curb the challenges of negative attitudes and resistance to change in the use of new technologies among academics.
 5. Government and respective institutions should support academics through the provision of flexible training programmes that will complement their initial education to improve their technology competence innovative practices. In other words, there should be periodic training and retraining to update their knowledge of emerging technologies as well as application mechanism.
 6. Increase in budgetary allocation for educational institutions by government will go a long way to close financial gaps that will decrease access and widen disparities in the use of ICT in teaching and learning. In addition, it will help to improve capacity to acquire and update new technologies needed for transformation.

REFERENCES

- Anderson, J. (2010). *ICT transforming education*. Bangkok, UNESCO.
<http://www.unesco.org/fileadmin/ict/e-book>
- Assan, T. & Thomas, R. (2012). Information and communication technology integration into teaching and learning: Opportunities and challenges for commerce educators in South Africa. *International Journal of Education and Development using Information and Communication Technology*, vol. 8, no. 2, pp. 4-16.
- Bingimals, K.A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of literature. *Eurasia Journal of Mathematics, Science and Technology Education*, vol. 5, no. 3, pp. 235-245
- Bozalek, V. (2011). An investigation into the use of emerging technologies to transform teaching and learning across differently positioned higher education institutions in South Africa. In G. Williams, P. Statham, N. Brown, & B. Cleland (Ed.), *Changing Demands, Changing Directions* (pp.156-161). Hobart Tasmania. Retrieved from
<http://www.ascilite.org.au/conferences/hobart11/procs/Bozalek-concise.pdf>
- Chuwuedo, S.O. & Igbinedion, V.I. (2014). ICT competences and capacity building needs of technical and vocational lecturers in Nigerian universities. *African Journal, of Interdisciplinary Studies*, vol. 7, pp. 45-53.
- Cubukcuoglu, B. (2013). Factors enabling the use of technology in subject teaching. *International Journal of Education and Development using Information and Communication Technology*, vol. 9, no. 3, pp. 50-60.

- Dziubar, C., Graham, C & Sicillia, N. (2018). Blended learning: The new normal and emerging technologies. *International Journal of Educational Technology in Higher Education*, vol. 3, no. 1, pp. 1-16.
- Glowatz, M. & O'Brien, O. (2017). Academic staff engagement and technology: Revisiting the technological, pedagogical and content knowledge framework (TPACK) in higher education (HE): The academics perspective. *IAFOR Journal of Education*, vol. 5, pp.133-157
- Grand-Clement, S. (2017). *Digital learning: Education and skills in the digital age*. Rand Corporation. www.rand.org/t/cf369
- Idumange, J. G. (2008). Nigerian universities and the emerging knowledge economy in sub-Saharan Africa, A paper presented at the 18th annual national conference of APQEN.
- Johnson, A. M., Jacovina, M. E., Russell, D. E. & Soto, C. M. (2016). Challenges and solutions when using technologies in the classroom. In S. A. Crossley & D. S. McNamara (Eds.), *Adaptive educational technologies for literacy instruction* (pp.13-29). Taylor & Francis.
- Jung, I. (2005). ICT-Pedagogy integration in teacher training: Application cases worldwide. *Educational Technology & Society*, vol. 8, no. 2, pp. 94-101.
- Kenechukwu, S. A., & Oboko, U. (2013). Information and communication technology in teacher education in Nigeria. *International Journal of Educational Foundations and Management*, vol. 1, no. 1, pp. 23-31. <http://www.ijefm.com>
- Koehler, M., Greenhalgh, S., Rosenberg, J. & Keenan, S. (2017). What technology is doing with teachers' digital portfolios: Using the TPACK framework to analyse teachers' technological understanding. *Journal of Technology and Teacher Education*, vol. 25, no.1, pp. 31-59.
- Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, vol.9, no. 1, pp. 60–70.
- Loveless, A. (2011). Technology, pedagogy and education: Reflections on the accomplishment of what teachers know, do and believe in a digital age. *Technology, Pedagogy and Education*, vol. 20, no. 3, pp. 301-316. <http://dx.doi.org/10.1080/1475939X.2011.610931>
- Majumdar, S. (2005) (Ed). Regional guidelines on teacher development for pedagogy technology integration. Bangkok, UNESCO. <http://unesdoc.unesco.org/images/004/001405e.pdf>
- Mitsuru, K. (2020). Digitally transforming work styles in an era of infectious disease. *International Journal of Information Management*, vol. 55, no. 1, 102172 <https://doi.org/10.1016/j.ijinfomgt.2020>.
- Nwabueze, A.I. & Ukaigwe, P.C. (2015). Application and utilisation of information and communication technology devices for record management in universities in South-East Nigeria. *Journal of Education in Developing Area*, vol. 23, no. 2, pp. 323-335.
- Nwokedi, O.I.U., Nwafor, S.O & Amaewhile, W. (2018). Information and communication technology capacity building skills of education lecturers in universities in South-South Nigeria. *Journal of Education in Developing Area*, vol. 26, no. 1, pp. 255-266.

- Nurul, I., Martin, B. & Frances, S. (2015). E-Learning challenges faced by academics in higher education: A literature review. *Journal of Education and Training Studies*, vol. 3, no. 5, pp. 103-112. <http://dx.doi.org/10.11114/jets.v3i5.947>
- Olele, C.N. & Williams, C. (2014). Connecting curriculum to technology in the classroom. In B. O. Emunemu & F. S. Akinwunmi (Eds.). *Educational management in Africa* (pp.16- 32). University of Ibadan.
- Rieber, L. & Welliver, P. (1989). Infusing educational technology into mainstream educational computing. *International Journal of Instructional Media*, vol. 16, no. 1, pp. 21-31.
- Robert-Okah, I. (2012). The role of ICT in university administration in Nigeria. *Journal of Education Review*, vol. 5, no. 2, pp. 249-258.
- Robinson, B., & Latchem, C. (2003). Teacher education: Challenges and change. In B. Robinson, & C. Latchem (Eds.), *Teacher education through open and distance learning*, London (pp.1-27). RoutledgeFalmer.
- Thomas, O.A., Ajetunmobi, F.G & Subair, S. Tayo (2016). Information and communication technology (ICT) enablers and professional development of academic staff in South West Nigerian Universities. *Journal of Sociology in Africa*, vol. 14, no. 1, pp. 43-52.
- Thakur, V & Raghuwanshi, P (2016). ICT as a transformation tool in teaching. *International Journal of Scientific Research and Management*, vol. 4, no. 7, pp. 4363-4370.
- Yilmaz, P.N. (2011). Evaluation of the technology integration process in the Turkish education system. *Contemporary Educational Technology*, vol. 2, no. 1, pp. 37-54.

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