OPTIMIZING ICT EFFECTIVENESS IN HEALTH EDUCATION INSTRUCTION AND LEARNING IN HIGHER EDUCATION: CHALLENGES AND OPPORTUNITIES

Olaoluwa S. Agbaje, Justina I. Ofuebe*, Prince Christian I. Umoke & Lawretta E. Ozoemena

Corresponding Author:

Justina I. Ofuebe, Department of Human Kinetics and Health Education, Faculty of Education, University of Nigeria, Nsukka, Enugu State, Nigeria

Abstract

Information and communication technologies (ICT) used in diverse disciplines have well-known benefits. In the teaching profession, they can promote efficient delivery of lectures, improve quality of teaching, educate the teachers and students. However, implementation of ICT in Nigerian higher education with reference to health education instruction and learning remains difficult and faces several challenges such as lack of required ICT skills by teachers, poor quality of interventions on ICT integration and teachers' behaviours. Nevertheless, the use of ICT by health education teachers and professionals can have positive impacts on their practice. The main objective of this review was to systematically summarize the best evidence regarding the effects of ICT on health education instruction and learning in higher education, challenges to its effectiveness, and opportunities. The review demonstrated that optimizing ICT in health education teaching and learning environments can efficiently foster rich learning experiences that result in achieving positive learning outcomes.

Keywords: Technologies, Teaching, Health education, learning, Outcomes

Introduction

In this information age, people have to access knowledge through information and communication technologies (ICT) to be well-informed about the latest developments within their spheres of influence. The use of ICT by teachers and students eliminates the constraints of space-time inherent in the traditional educational system. Also, ICT alters thought patterns, enriches existing educational models, and provides new training models (Talebiana, Mohammadia, & Rezvanfara, 2014). These models share features of technology-based training and suggest new learning methods in which the learner plays an active role and also emphasizes self-directed, independent, flexible and interactive learning (Faraj Allahi& Zarif Sanayei, 2009).Lozano, Alcaraz, and Bernabeu (2012) posited that ICT is transforming educational processes and the students' learning experiences. Thus, the use of ICT is seen as a priority when it comes to the education of students with diverse support needs. Different definitions of ICT exist in literature. This review examines a few definitions to provide profound insight.

A diverse set of technological tools and resources used to transmit, store, create, share, or exchange information. These technological tools and resources include computers, the internet (websites, blogs, and emails), live broadcasting technologies (radio, television, and webcasting), recorded broadcasting technologies (podcasting, audio and video players, and storage devices) and telephony (fixed or mobile, satellite, Visio/video-conferencing, etc. (UNESCO Institute for Statistics [UIS], 2009). Also, ICT refers to an integrated framework of computers, software applications, multimedia content, the Internet, web-based applications, learning management systems and other tools that can be used to enhance the teaching and learning process (Alfahad, 2012). Duță and Martínez-Rivera (2015) posited that ICT enhances the acquisition, production, storage and processing, reporting, recording and presenting information in the form of voice, images, and data contained in nature acoustic signals, optical or electromagnetic. ICTs include electronic as a base technology that supports the development of telecommunications technology, computers, and audiovisual (Duta, 2012).

ICT tools are enablers in the learning dynamics, in terms of not only content appropriation when developing students' key competencies, but also when creating appealing spaces that invite interaction and information exchange (Livingstone, 2012). These technology-based resources facilitate the design of the teaching-learning process to the characteristics, interests and needs to the student (Luque, Rodríguez & Romero, 2005), promoting their active participation to help achieve the academic goals and achievement targets previously established by the teaching professional (Rose, Meyer & Hitchcock, 2005), while facilitating individual, cooperative and interactive work in class (McFarlane, Triggs & Ching, 2009). Apart from enhancing student's learning experience, the role of ICTs in capacity building/training of educational personnel in higher education has become inevitable.

Use of ICT in Higher Education

The use of ICT in higher education teaching practice has become a necessity globally. One of the main sectors that should be changed and modified is education in general and higher education in particular. All the new information and communication technologies are changing the learning process in higher education. ICT based learning becomes more and more widespread in higher education institutions, and therefore, quality assurance processes and quality management systems are of high importance. E-education can provide access to the best gurus and the best practices or knowledge available (UNESCO, 2002). The higher education sector plays a vital role in social and economic development in any country from across the globe. Today, many universities are integrating ICTs in order to facilitate the acquisition and absorption of knowledge and to align with this fast-evolving technology. The trend towards a knowledge-based economy has emphasized the importance of universities as repositories of valuable human capital to help secure

shares in the global market. The process of education using ICTs can be classified in e-learning, blended learning, and distance learning. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes, and CD ROMs have been used in education for different purposes (Bhattacharya & Sharma, 2007).

ICTs can be used in education to: facilitate the acquisition and absorption of knowledge; offer opportunities to developing countries to enhance educational systems; improve policy formulation and execution; widen the range of opportunities for business and individuals. Key advantages of ICTs used in education and e-learning include improved open access to education, better integration for non-full-time students (particularly in continuing education, provision of tools to enable students to solve problems independently, acquisition of technological skills through practice with tools and computer, cost-effectiveness and developing students' self-discipline. Therefore, a higher education institution needs to have innovative ICT practices in critical areas, such as open and distance learning, blended learning, research, administration and management (Pavela, Fruthb, &Neacsuc, 2015).

Teachers' Dynamic Role and ICT Usage

The role of teachers, including health education teachers is increasingly essential in the emerging cultural and educational environments that are being created and to be created with the help of ICT. Teachers' willingness to learn how to use new technologies is significant. However, in educational contexts, the teaching-learning process must be directly related to learning content designed by the policymakers, and educational experts to fulfill the diverse needs of the learners for individual development and national growth. Therefore, teachers' role in the ICT era is becoming more dynamic, and they need to develop the required core competencies (for instance, computing skills, design of E-learning instructions, etc.) to optimize the effectiveness of ICT for the attainment of improved learning outcomes and productivity.

The International Society for Technology in Education (ISTE) emphasizes that the teachers of today should prepare to provide technology-based learning opportunities for the students. Preparation for applying the technology and awareness of technology to enhance the quality of the students learning should be one of the teacher's necessary skills (Kelly & Anear, 2002). Full integration of ICT in the pedagogical processes of the 21st century Nigerian higher education can transform the educational landscape and unleash the untapped and dormant potentials of our teeming youths for national growth and development.

Nevertheless, teachers' characteristics could directly or indirectly hamper creativity and innovations in educational settings. Pryor, Akyeampong, Westbrook, and Lussier (2012) asserted that teacher characteristics are heterogeneous and

include: gender; background in terms of location within a country (urban/rural); educational experience and qualifications; teaching experience; attitudes and beliefs around teaching and learning. Such characteristics could hinder creativity and innovation. The theory of andragogy or adult learning suggests that adults build on these characteristics, and in contrast to children, have their own developed self-concept, have greater learning readiness and can take on practical, problem-solving approaches. Prior experience may also, however, block out acceptance of new concepts or content. Experienced teachers routinize much of their practice, making it habitual and automatic, built on tacit, situated knowledge (Knowles, Holton, & Swanson, 2005). In contrast, novice teachers need to learn their practice consciously while avoiding cognitive overload (Abadzi, 2006).

Therefore, for creativity and innovations to flourish in the Nigerian higher education settings, teachers' traits that are resistant to change (e.g., use of educational technologies) should be modified. For instance, there is a paradigm shift from the traditional teacher-centered learning environment to a more inclusive student-centered learning approach (interactive teaching and learning). Furthermore, learning occurs when students participate in activities that are ideally in authentic situations, or those that approximate as closely as possible to the contexts in which the knowledge will later be required. Authentic tasks and simulations that approximate to 'real' situations with teachers modelling expert practice are central academic approaches in this theory of learning. Such collaborative teacher professional development is seen as key to improving education systems globally (Mourshed et al., 2010). Thus, the use of ICT in all its ramifications makes the teaching-learning process more enjoyable. The learners are actively involved, the teachers more dynamic, productive, and learners' skills acquisition enhanced via an array of opportunities provided by ICT. One of the disciplines that need creativity and innovations, such as the use of ICT in the teaching-learning process is health education.

Health education instruction, learning, and ICT

Health education has been defined variously as a process and a profession. When viewed as a process, it connects mainly with health promotion. For example, the Galway Consensus Conference noted that both health promotion and health education "refer to efforts that enable and support people to exert control over the determinants of health and to create environments that support health" (Allegrante et al., 2009). When viewed as a profession, it is concerned with health promotion processes. Health education meets most of the standards of a job, including professional organizations, standards for practice, and credentialing (Taub, Allegrante, Barry, & Sakagami, 2009). Although health education is not the only profession that engages in health promotion, it is perhaps the one profession that is devoted exclusively to health promotion (Simons-Morton, 2012). Health education

also refers to consciously constructed opportunities for learning involving some form of communication designed to improve health literacy, including improving knowledge, and developing life skills, which are conducive to individual and community health (WHO, 1998). Therefore, health education, as a tool for health promotion, is critical for improving the health of populations and promotes health capital (World Health Organization [WHO], 2012).

To improve populations health and promote health capital, health educators engage in numerous activities. These activities occur in schools, workplaces, clinics, and communities and include topics such as healthy eating, physical activity, tobacco use prevention, mental health, HIV/AIDS prevention, and safety. Health educators are hard-working, enthusiastic, and dedicated (WHO, 2012). The activities of health educators have been defined in the sphere(s) of influence. The United States National Commission for Health Education Credentialing (NCHEC, 2012) has identified seven major responsibilities for the health educator as well as the competencies and sub-competencies that demonstrate competency under each responsibility. The major responsibilities for health educators are: assessing individual and community needs for health education; planning effective health education programmes; implementing health education programmes; evaluating the effectiveness of health education programmes; communicating health and health education needs, concerns and resources; coordinating the provision of health education services; and acting as resource people in health education.

It is the tradition of academics to contribute new ideas, thinking, and practices to their respective fields. Health education is not immune to the changes introduced by technological developments. Thus, health educators must avail themselves of existing and emerging technologies. The use of ICT could facilitate the attainment of the main discipline goal as envisioned by the rational model, that is, the goal of providing scientifically sound health-related information (knowledge) that informs attitudes and modifies behaviours/practices (behaviour change). Health education is replete with opportunities for teachers and students to contribute significantly to self-development, self-reliance, institutional, and national development.

However, several challenges exist that hinder the effective and efficient performance of these responsibilities. These include access to and knowledge of up-to-date tools that can help educators engage in effective health education practice (WHO, 2012). Access to and knowledge of updated skills in health education practice are an integral part of innovative tools a health educator needs to excel in the 21st century. One of such innovative tools is ICT.

The use of ICT in health education instruction and learning is one of the innovative ways of creating more viable opportunities for learners to acquire the necessary skills for self-empowerment and self-reliance. ICT has primarily impacted the learning pedagogy at schools and vocational education. The relevance of education and training in the holistic development process is quite highlighted by the

United Nations Educational, Scientific, and Cultural Organization (2013) statement that posits "a quality technical and vocational education training (TVET) programme plays an essential role in promoting a country's economic growth and contributing to poverty reduction as well as ensuring the social and economic inclusion of marginalized communities". Dondi (2005) asserted that though many applications of information and communication technologies that can presently be observed do not substantially change the conventional teaching habits when technology use is integrated in a broader innovation effort its potential to stimulate, accompany and amplify change is enormous. Nevertheless, health education teachers encounter a myriad of challenges in the use of ICT in the delivery of instruction. These challenges also impact on learning outcomes of the students.

Some challenges of ICT use by teachers and educational institutions have been identified. The European Commission for Digital Education and Culture (2004) outlined the challenges to include: a lack of knowledge in the ICT areas and insufficient information; resistance to change; absence of a coherent and comprehensive management and quality management approaches; lack of high-quality materials; the possibility of cheating; difficulties in using the ICTs; and less communication and interaction between students and teacher. Furthermore, other challenges associated with introducing ICTs into teaching according to UNESCO (2009) include: installing learning technology without reviewing student needs and content availability; imposing technological systems from the top down without involving faculty and students; using inappropriate content from other regions of the world without customizing it appropriately; and producing low quality content that has poor instructional design and is not adapted to the technology in use.

Although the challenges of ICT application in instruction and learning in higher education are numerous and appear insurmountable, the willingness and determination to tackle these challenges rest on the higher education policymakers, national universities commission (NUC), university authorities, ministry of Education and health educators. For instance, in particular, the government through its agencies/parastatals and interventions (e.g., TETFUND) should support a massive development of ICT in higher educational settings, ICT leadership, and human resources to eradicate the challenges.

Conclusion

Information and communication technologies play a vital role in the future development of higher education institutions and represent a catalyst for innovation, quality, and excellence in this sector. At the national level, the integration of ICT and E-learning for innovation and quality in higher education should become a key priority for all involved institutions. At the university level, there should be developed a holistic strategy focusing on integrating ICT for e-learning. For successful and effective

use of ICT in enhancing the quality of teaching and learning, policymakers need to be aware of how these evolving technologies can be of best value in their country's education system, and, in this regard, have to develop a supportive policy environment and framework at the national level for the integration of ICT into their education systems. Universities have to face the challenge of increasing access to higher education and improve the quality of higher education against the stark reality of decreasing resources. Also, Health Education professionals require the technical skills to make a meaningful impact in the current knowledge-based society. Since ICT and e-learning have a great impact on the educational processes and systems, researches and learning initiatives, especially within higher education institutions, their use, and effective integration could further unleash the potentials of the teachers and students for self-reliance. Although there are numerous challenges such as lack of finance, qualified human resources, poor power supply, network, and quality resources, the greatest challenge is attitude (negative). Therefore, health educators should change their position, embrace and optimize the opportunities that ICT offers for improved performance of their responsibilities to the learners, communities, and entire nation.

References

Abadzi, H. (2006). *Efficient learning for the poor: Insights from the frontier of cognitive neuroscience*. Washington, DC: The World Bank.

Alfahad, F.N. (2012). Effectiveness of using information technology in higher education in Saudi Arabia. *Procedia - Social and Behavioral Sciences, 46*, 1268 – 1278

Allegrante, J. P., Barry, M. M., Airhihenbuwa, C. O., Auld, M. E., Collins, J. L., Lararre, M. C., & Mittelmark, M. (2009). Domains of core competency, standards, and quality assurance for building global capacity in health promotion: The Galway Consensus Conference Statement. *Health Education & Behavior, 36*, 476-482.

Bhattacharya, I. & Sharma, K. (2007). India in the knowledge economy – an electronic paradigm. *International Journal of Educational Management*, 21 (6), 543–568.

Duță, N., & Martínez-Rivera, O. (2015). Between theory and practice: the importance of ICT in Higher Education as a tool for collaborative learning. *Procedia - Social and Behavioral Sciences, 180*, 1466 – 1473.

Faraj Allahi, M., & Zarif Sanayei, N. (2009). Education based on information and communication technology in higher education. *Journal of Education Strategies, 4*(2), 167-171.

Kelly M.G., & Anear. M.C. (2002). *National educational technology standards for teachers, preparing teachers to use technology*. Eugene, OR: International society for technology in educational (ISTE).

Knowles, K., Holton, E.F., & Swanson, R.A. (2005) *The adult learner: The definitive classic in adult education and human resource development*. Oxford: Elsevier

Lozano, J., Alcaraz, S. &Bernabeu, M. (2012). Competenciasemocionales del alumnado con trastornos del espectroautistaen un aula abiertaespecífica de Educación Secundaria. *Aula Abierta, 40*(1), 15-26.

Livingstone, S. (2012). Critical reflections on the benefits of ICT in education. *Oxford Review of Education, 38* (1), 9-24. doi: 10.1080/03054985.2011.577938

McFarlane, A., Triggs, P. & Ching, W. (2009). *Researching mobile learning: Overview*. Retrieved from http://dera.ioe.ac.uk/1473/1/becta_2009_mobilelearning_summary.pdf

Mourshed, M., Chijioke, C., & Barber, M. (2010). *How the world's most improved school systems keep getting better*. Retrieved from http://www.mckinsey.com/client_service/social_sector/latest_thinking/worlds_most_improved_schools

National Commission for Health Education Credentialing (NCHEC, 2012). *Responsibilities and competencies for health education*. Retrieved from http://www.henod.org/Health_Educator_Competencies.pdf

Pavela, A.P., Fruthb, A., &Neacsuc, M.N. (2015). ICT and E-Learning – Catalysts for Innovation and Quality in Higher Education. *Procedia Economics and Finance*, 23, 704 – 711.

Pryor, J., Akyeampong, K., Westbrook, J., & Lussier, K. (2012). Rethinking teacher preparation and professional development in Africa: An analysis of the curriculum of teacher education in the teaching of early reading and mathematics, *Curriculum Journal, 23* (4), 409-502.

Rose, D., Meyer, A. & Hitchcock, C. (2005). *The Universally Designed classroom: accessible curriculum and digital technologies*. Cambridge: Harvard Education Press.

Simons-Morton B. (2012). Health Behavior in Ecological Context. *Health Education & Behavior, 40*(1), 6-10. DOI: 10.1177/1090198112464494

Talebiana, S., Mohammadia, H.M., &Rezvanfara, A. (2014). Information and communication technology (ICT) in higher education: advantages, disadvantages, conveniences and limitations of applying e-learning to agricultural students in Iran. *Procedia - Social and Behavioral Sciences, 152*, 300 – 305.

Taub, A., Allegrante, J. P., Barry, M. M., & Sakagami, K. (2009). Perspectives on terminology and conceptual and professional issues in health education and health promotion credentialing. *Health Education & Behavior, 36*, 439-450.

UNESCO (2002). *Open and Distance Learning Trends, Policy and Strategy Considerations*. UNESCO

UNESCO Institute for Statistics (2009). *Guide to measuring Information and Communication Technologies (ICT) in education*. Technical Paper No. 2.Montreal: UIS.

UNESCO (2009). *ICTs for Higher Education – Background Paper Commonwealth of Learning*. Paris, UNESCO.

UNESCO (2013). *UNEVOC e-Forum - Virtual Conference on ICTs & TVET, what are the implications of the ICT revolution for TVE*T? UNESCO.

WHO (1998). *Health promotion glossary*. Geneva: WHO. Retrieved from http://www.who.int/hpr/NPH/docs/hp_glossary_en.pdf.

WHO (2012). *Health education: theoretical concepts, effective strategies and core competencies: a foundation document to guide capacity development of health educators*. WHO: Regional Office for the Eastern Mediterranean. ISBN: 978-92-9021-828-9