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REIMAGINING EDUCATION: BUILDING TECHNOLOGY EDUCATION FOR THE DIGITAL ERA

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Abstract
In today's rapidly evolving digital landscape, technology education plays a vital role in shaping the future of our students. This paper explores innovative approaches to building technology education that prepares students for the digital era. It examined the current state of building technology education, discusses the role of emerging technologies, and identified strategies for fostering digital literacy, creativity, and acquisition of relevant practical skills. It made some suggestions which are aimed at reimagining and shaping the future of building technology education in the digital era.

Keywords: - Technology Education, Digital Era, Emerging Technologies, Digital Literacy, Innovation, building technology.

Introduction

The rapid pace of technological progress has led to significant developments in education across the globe. Its historical development illustrates the gradual change that took place in pedagogical landscape due to innovative aspects on content dissemination methods, learning activities and classroom behaviour management using different technology tools (Berndt et al., 2017; Car et al., 2019; Fingrut & Ng, 2023). In addition, technology was not left aside as the key to education during the struggles of COVID-19 pandemic. Educational institutions have been pushed to consider new teaching strategies, such as halting courses without interfering with instruction, in response to the challenges of decreasing social interaction and continuous learning. In the view of Lam and Ng, (2023), only with the introduction of digital devices, the Internet, and videoconferencing has this myth come to pass. Regardless of whether we are in the post-pandemic era, it is conceivable that the quick development of technology will continue transforming education as a whole.

Historically, Nigerian higher education institutions have encountered several challenges in delivering effective building technology education {BTE} courses. According to Umar et al, (2023), Opoola, (2020), and Obadoyin, (2018), these challenges include a gap between theoretical knowledge and its practical application, limited access to contemporary learning resources, and inadequate infrastructure. The traditional lecture-based teaching approach to BTE students in our institutions frequently fails to sufficiently prepare BTE students for the real-world challenges faced by the construction industry, leaving a workforce that is devoid of essential practical experience. Accordingly, Soliman et al., (2021), is of the view that providing BTE students with engaging and realistic learning experiences that closes the gap between theory and practice, and by integration of digital tools into the building technology education curriculum would these challenges be tackled and solved.

A number of academic fields, such as engineering, health, and the arts, have previously demonstrated the efficacy of digital technology (Jensen & Konradsen, 2018; Pantelidis, 2010).
When used in building technology education, it can produce lifelike construction site simulations, improving students' understanding and memory of complex topics through structural design projects and maintenance practices (Abulrub et al., 2011; Whyte et al., 2000). In this regard, a significant shift in building technology education will occur with a shift from traditional blackboard-based instruction to digitally interactive learning settings. This shift, which is frequently described as going "from blackboard to dashboard," represents a more significant, systemic shift in educational ideas and practices than merely a surface-level embrace of new technologies. This shift calls for astute leadership, in-depth knowledge of the digital environment, and a careful approach to incorporating technology into teaching methods. In today's fast-paced digital world, it is evident that BTE needs to adapt to keep up with the ever-changing landscape of technology. With the rise of online learning and the integration of digital tools in traditional classrooms, it is clear that education generally is in the midst of a major transformation. The need for a shift towards a more modern and dynamic approach to BTE is essential to prepare students for the world they will enter upon graduation. This is where the concept of reimagining building technology education for the digital era comes into play.

Challenges in Transitioning to Digital Building Technology Education

Building technology education is of paramount importance in the acquisition of the necessary skills and knowledge essential for the construction and architectural sectors. This field encompasses a diverse array of subjects, including architectural design, construction techniques, materials science, and structural engineering (Emmitt & Gorse, 2013). The major objective is to equip BTE students with the competences needed to meet both the practical and theoretical demands of the building industry. The integration of contemporary construction technologies into the curriculum has progressively gained significance to ensure the readiness of graduates to confront modern challenges in the field (Becerik-Gerber et al., 2011).

Building technology education in Nigeria has always placed more emphasis on theoretical topics than on real-world applications (Aina et al., 2019). This method usually leaves graduates unprepared for the reality of the construction industry, where practical skills and hands-on experience are of extreme importance (Okolie et al., 2019). The gap that currently exists between industrial demands and academic instruction emphasizes the need for an improved curriculum that includes more hands-on experience and the use of modern technologies (Alagbe et al., 2020). Most educators and industry professionals acknowledged that improving building technology education is essential to improving the overall quality of construction projects and closing the skills gap in the industry (Ogunyemi, 2014). Adopting cutting-edge instructional strategies and modern technology can provide students with immersive learning experiences.

Enhancing technological education in Nigeria has continued to encounter a number of major constraints. A key challenge is the lack of modern resources and infrastructure necessary for efficient teaching and learning (Aina et al., 2019). Obsolete equipment and poor facilities impedes hands-on training from being offered in many institutions offering BTE at all levels, this has an impact on the quality of BTE graduates' competences for the world of work (Alagbe et al., 2020). Ugwuannyi, Okeke, and Mokhele, (2022). Are of the view that the major problem is that BTE curricula do not match the changing demands of the construction industry Classroom instruction and real-world field skills are not aligned, leaving BTES graduates ill-prepared to meet industrial objectives.

Additionally, a significant obstacle is the lack of certified teachers with both academic and industry experience. Despite having solid academic backgrounds, many teachers lack the real-world industrial experience needed to teach practical skills (Eze & Chinedu-Eze, 2020). The quality of education and how well students are prepared for employment are both impacted by this knowledge gap. The quality of building technology education is also severely hampered by financial limitations. According to Ayo-Vaughan et al. (2020), a number of universities lack the necessary funds for faculty development, training initiatives, and current equipment. The ability of institutions to incorporate cutting-edge technologies and approaches that could improve learning outcomes is hampered by this financial deficiency. These challenges require a comprehensive approach involving collaboration among educators, technologists, and policymakers to ensure a successful transition to digital building technology education.

Rethinking the Framework of Digital Technology in Building Technology Education

Technology has become an integral part of our daily lives, and it is only natural that it should play a significant role in education as well. The use of technology in the classroom can enhance learning outcomes by providing students with a more interactive and engaging learning experience. With the use of digital tools, building technology education students can access vast amounts of information at their fingertips, collaborate with peers, and even create their own content. In this regard, it is evident that more and more schools are incorporating technology into their curriculum, whether it’s through online courses, interactive whiteboards, or educational apps. However, BTE, especially in colleges of education in Nigeria is still using technology as a supplement rather than fully integrating it into the learning process. The key to reimagining BTE for the digital era is to move beyond mere incorporating technology

and to make it an integral part of the learning experience for building technology education. To fully embrace the digital era, there needs to be a fundamental shift in the framework of traditional building technology education. This includes rethinking the way we deliver BTE lectures, the role of teachers/instructors/ lecturers etc., and the skills needed by students to thrive in the future workplace.

The use of digital technology in BTE has the potential to improve the learning process by increasing engagement, providing interactive learning experiences, and improving skill outputs. Virtual Reality (VR), Augmented Reality (AR), and Building Information Modeling (BIM) are examples of technology-enhanced education tools capable of creating immersive and interactive learning environments (Sacks et al., 2013). These technology innovations allow students to visualize complex structures, conduct virtual site visits, and collaborate on design projects in real time, resulting in a more experiential learning technique (Abulrub et al. 2011).

Reimagining Building Technology Education for the Digital Era

Reimagining BTE for the digital era is an ongoing process that needs to keep up with the rapid advancements in technology. This means that instead of constantly playing catch-up, BTE need to be agile and adaptive to stay ahead of the curve. Better collaboration between educational institutions offering building technology and construction companies is needed to create a more seamless integration of technology in BTE. The COVID-19 pandemic era has forced educational institutions to accelerate digital transformation. With the sudden shift to remote learning, it has become apparent that virtual learning is here to stay and will continue to play a significant role in the future of educational institutions.

Way Forward on Reimagining Building Technology Education for the Digital Era

To fully embrace the digital era, there needs to be a fundamental shift in the framework of traditional building technology education. This includes rethinking the way we deliver BTE lectures, the role of teachers/instructors/ lecturers etc., and the skills needed by students to thrive in the future workplace.

Personalized Learning

One of the most significant advantages of digital technology in education is the ability to personalize learning. With the use of adaptive learning software, students can work at their own pace, receive instant feedback, and focus on

areas where they need improvement. This allows students to take control of their learning and develop skills that are tailored to their individual needs.

The Role of Teachers

The role of teachers is also evolving in the digital era. Rather than being the sole source of information, teachers are now becoming facilitators and guides in the learning process. They can use technology to create more interactive and engaging lessons, provide personalized feedback, and even monitor student progress more effectively.

BTE Skills for the Digital Era

In today's digital workplace, the skills needed for success are constantly evolving. Students need to be equipped with digital literacy, critical thinking, and problem-solving skills to adapt to the ever-changing landscape of the job market. Therefore, education needs to focus on developing these essential skills instead of just knowledge acquisition.

Conclusion

The digital era has created endless opportunities for building technology education to evolve and adapt to meet the needs of the future. It is time to rethink the traditional approach to building technology education and embrace the power of technology to create a more personalized, engaging, and effective learning experience for building technology education students in our institutions. By reimagining building technology education for the digital era and beyond, we can better prepare BTE students for the ever-changing landscape of the modern world. This journey is about reimagining building technology education for the digital age, ensuring that BTE students have the skills, knowledge, and adaptability needed to thrive in an increasingly digital world.

Recommendations

Strategies for Fostering Digital Transformation in Building Technology Education

Digitalizing and transformation in BTE demands a strategic and multifaceted approach. Policy makers and implementers must champion a culture of innovation and change, preparing BTE students to transition to digital learning environments. This will involve investing in professional development for BTE lecturers, teachers, and ensuring that they are equipped with the skills and knowledge to utilize digital tools in their teaching effectively. It also includes advocating for equitable access to technology recognizing that BTE students come from diverse backgrounds with varying levels of access to digital resources.

References

Abulrub, A.H.G., Attridge, A. & Williams, M. A. (2011). Virtual Reality in Engineering Education: The Future of Creative Learning. International Journal of Emerging Technologies in Learning (iJET), 6(4), 4–11.

Becerik-Gerber, B., Gerber, D.J. and Ku, K. (2011). The Pace of Technological Innovation in Architecture, Engineering, and Construction Education: Integrating Recent Trends into the Curricula. Journal of Information Technology in Construction, 16(24), 411-432. Emmitt, S. & Gorse, C. A. (2013). Barry's Introduction to Construction of Buildings. Wiley
Blackwell.

Jensen, L., & Konradsen, F. (2018). A review of the use of virtual reality head-mounted displays in education and training. Education and Information Technologies, 23(4),
1515-1529.

Obadoyin, S.J. (2018). Barriers to Effective Teaching and Learning of Building Construction in Government Science and Technical Colleges in Kogi West Senatorial District, Kogi State, Nigeria. Global Scientific Journals, 6(1), 97-118.

Okolie, U. C., Igwe, P. A., & Elom, E.N. (2019). Improving graduate outcomes for technical colleges' in Nigeria. Australian Journal of Career Development. 28(1), 21-30.

Opoola, A. (2020). An Appraisal of the Challenges of the Implementation of Building Technology Curriculum in Nigerian Polytechnics. A paper presented at 2nd
International Conference of the Federal Polytechnic Illaro. Virtual.

Pantelidis, V. S. (2010). Reasons to use virtual reality in education and training courses and a model to determine when to use virtual reality. Themes in Science and Technology Education, 2(1-2), 59-70.

Soliman, M., Pesyridis, A., Dalaymani-Zad, D., Gronfula, M. & Kourmpetis, M. (2021). The Application of Virtual Reality in Engineering Education. Applied Sciences, 11, 2879.

Ugwuanyi, C.S., Okeke, C.I.O., & Mokhele-Makgalwa, M.L. (2022). University Academics'
Perceptions Regarding the Use of Information Technology Tools for Effective Formative Assessment: Implications for Quality Assessment through Professional Development. International Journal of Higher Education, 11(1), 1-11.

Umar, L., Okanya, A.V., Yakubu, A., Ezugwu, C., Ede, E.O. & Ohanu, I.B. (2023). Addressing Curriculum Challenges in Building and Woodwork Technology Programs at Nigerian Universities for Graduate Employability. Industrial Technical Education Journal, 5(1), 104-112.

Whyte, J., Bouchlaghem, D., Thorpe, A., & McCaffer, R. (2000). From CAD to virtual reality:
Modelling approaches, data exchange and interactive 3D building design tools.
Automation in Construction, 10(1), 43-55.