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Digital Technology and Transformation in Building Construction Industry

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Abstract
Today, more than ever, the role of digitalisation technology in teaching and learning is of great importance because of the use of digital technology in building construction industry. With the help of various applications for drawing, detailing, specifications and cost. This will reduced difficult task and enhance efficiency for teachers and students themselves, they see the advantage technology in education. Aware of this, the Federal Government in its statement on the National Policy on Information and Communication Technology (ICT) in education identified the critical role of ICT, towards the attainment of the National Vision within the context of the constitution of the Federal Republic of Nigeria, the National Policy on Education, Ministerial Strategic Plan: Education for Change and Sustainable Development Goals (SDGs). Since independence, Nigeria has had an encompassing quantitative education with minimal or no impact on technological advancement. Despite the constant previous reforms in the sector to make it more impactful, the challenges persisted, just as panaceas abound, but the questions remained, hence the clamour for digital technology and education transformation.

Keywords*:* Digital Technology, Transformation of Building Construction Industry.

Introduction

Today there are high-demand jobs were created in the last decade, as advances in technology drive globalization and digital transformation, teachers can help students acquire the necessary skills to succeed in the careers of the future. acc International Society for Technology in Education (ISTE, 2020). The COVID-19 pandemic is quickly demonstrating why online education should be a vital part of teaching and learning. By integrating technology into existing curricula, as opposed to using it solely as a crisis-management tool, teachers can harness online learning as a powerful educational tool. The effective use of digital learning tools in classrooms will increase student engagement, help teachers improve their lesson plans, and facilitate personalized learning. It also helps students build essential 21st-century skills. Virtual classrooms, video, augmented reality (AR), robots, and other technology tools can not only make class more lively, they can also create more inclusive learning environments that foster collaboration and inquisitiveness and enable teachers to collect data on student performance (Bouygues, 2023). Still, it's important to note that technology is a tool used in

education and not an end in itself. The promise of technology education lies in what educators do with it and how it is used to best support their students' needs. Teachers want to improve student performance, and technology can help them accomplish this aim. To mitigate the challenges, administrators should help teachers gain the competencies needed to enhance learning for students through technology. Additionally, technology in the classroom should make teachers' jobs easier without adding extra time to their day. (Souza, Chimenti, & Nogueira, 2020).

The building construction industry is well positioned to make good use of a range of technology on offer. Indeed, many digital applications are already being used in the construction sector to positive effect: Modular construction, building information modelling big data, additive manufacturing, robotics, IoT, and virtual twins to name a few (Clarke, 2022). In this article, we'll decode digital transformation advances in construction, see how the industry has fared in terms of modern advances, and examine how incorporating technology can help the sector improve further. Technology today is broadly accepted as a way to effect positive change in the building construction industry. The move from siloed legacy technology to a data-driven and analytical digital approach has helped the industry to level-up.

Digital Technology and the transformation in the building construction industry

The potential impact of digital technology on the building construction industry is significant, presenting businesses with an opportunity to streamline more traditional processes to achieve greater efficiencies, reduce errors and improve profitability. For example, technology can provide construction businesses with tools for project completion time tracking and for moving paper forms online. It can also provide a more efficient solution for field and site data collection. Technology can help deliver improvements in pre-construction with considerable efficiency gains in bid team performance. Furthermore, the time saved by applying digital tools can be invested in relationship management and communications. Research indicates productivity gains of 14 to 15 percent and cost cuts of 4 to 6 percent are achievable through digital transformation, (Tomlinson, 2019). Additionally, the pandemic highlighted the importance of having mechanisms to facilitate remote work in the building construction industry. With bespoke technology in place that recognizes the unique needs of the building construction industry, remote work can be more easily incorporated into the sector.

Importance of Technology to Students and Teachers

Technology provides students with easy-to-access information, accelerated learning, and fun opportunities to practice what they learn. It enables students to explore new subjects and deepen their understanding of difficult concepts, particularly in build construction. Through the use of technology inside and outside the classroom, students can gain 21st-century

technical skills necessary for future occupations. Still, children learn more effectively with direction. The World Economic Forum reports that while technology can help young students learn and acquire knowledge through play, for example, evidence suggests that learning is more effective through guidance from an adult, such as a teacher.

Application and Challenges of Digital Technology in Building Construction Industry

In comparison to other sectors the application of technology in the building construction industry, particularly in the back-office, has seen a slower paced adoption. One of the reasons for this digitalisation gap could be down to the way the building construction industry works, operating in a linear manner involving different stakeholders and complex supply chains, (Watkins, 2022). Construction task completion is passed on by one partner to another as a project moves towards completion. Challenges like collaboration obstacles, lack of skills, and budgetary issues have slowed down a more unified and effective approach to industry-wide digitalisation. Occasionally, business leaders lacking the right level of experience or the latest insights into the adoption of modern solutions have also hampered progress. Today however, technology is being accepted as a must-have, and we expect to see its adoption accelerate over the next few years.

According to (Michael, 2021) proactive steps to make digitalisation a successful:

1. Devise the right digital transformation strategy - a detailed study of your current operational procedures and the possible solutions that can deliver improvements can be the foundational stone of your digital success.

2. Prepare your organisation for cloud adoption - cloud technology has a significant role to play and is currently being used in various industries to positive effect. The construction industry can also leverage this technology to drive efficiency and cost gains. The cloud provides a central database that's easily accessible, and data is continually backed-up and shared safely to multiple stakeholders, whereas data on a laptop or other device can be vulnerable to loss.

3. Ensure the security of your systems - this is a key component of your digital strategy. Construction firms cannot afford to compromise critical client or commercial data, which means strong security mechanisms must be in place.

Digital Technology Challenges

However, digital technology has its challenges, particularly when it comes to implementation and use. For example, despite growing interest in the use of, artificial intelligence, and other emerging technology, less than 10 percent of school's report having these tools in their classrooms, according to Project Tomorrow. Additional concerns include

excessive screen time, the effectiveness of teachers using the technology, and worries about technology equity.

Prominently rising from the COVID-19 crisis is the issue of content. Educators need to be able to develop and weigh in on online educational content, especially to encourage students to consider a topic from different perspectives. Bao, W. (2020). The urgent actions taken during this crisis did not provide sufficient time for this. Access is an added concern — for example, not every school district has resources to provide students with a laptop, and internet connectivity can be unreliable in homes.Additionally, while some students thrive in online education settings, others lag for various factors, including support resources. For example, a student who already struggled in face-to-face environments may struggle even more in the current situation. These students may have relied on resources that they no longer have in their homes.

Conclusion

Teachers want to improve student performance, and technology can help them accomplish this aim. To mitigate the challenges, administrators should help teachers gain the competencies needed to enhance learning for students through technology. Additionally, technology in the classroom should make teachers' jobs easier without adding extra time to their day. Technology provides students with easy-to-access information, accelerated learning, and fun opportunities to practice what they learn. It enables students to explore new subjects and deepen their understanding of difficult concepts through the use of technology inside and outside the classroom, students can gain 21st-century technical skills necessary for future occupations.

Still, children learn more effectively with direction. The World Economic Forum reports that while technology can help young students learn and acquire knowledge through play, for example, evidence suggests that learning is more effective through guidance from an adult, such as a teacher. Leaders and administrators should take stock of where their faculty are in terms of their understanding of online spaces. From lessons learned during this disruptive time, they can implement solutions now for the future. For example, administrators could give teachers a week or two to think carefully about how to teach courses not previously online. In addition to an exploration of solutions, flexibility during these trying times is of paramount importance. Leaders and administrators should take stock of where their faculty are in terms of their understanding of online spaces. From lessons learned during this disruptive time, they can implement solutions now for the future. For example, administrators could give teachers a week or two to think carefully about how to teach courses not previously online. In addition to an exploration of solutions, flexibility during these trying times is of paramount importance.

References

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University.

Bouygues,U. K. (2023). Technology Enhanced Learning | KTH. Media Technology and Interaction Design. Retrieved from: https:// www. kth. se/ hct/ mid/ resea rch/ techn ology-enhan ced/ techn ology- enhan ced- learn ing-1. 780656. Accessed 17 Aug 2021

Clarke, T. (2022). Sources of teachers' self-efficacy for technology integration from formal, informal, and independent professional learning. *Educational Technology Research and Development, 68*, 89–108. https:// doi. org/ 10. 1007/ s11423- 019- 09671-6.

Michael, J. L. (2021). Exploring models for increasing the effects of school information and communication technology use on learning outcomes through outside-school use and socioeconomic status mediation: The Ecological Techno-Process. *Educational Technology Research and Development,68*, 413–436. https:// doi. org/ 10. 1007/ s11423-019- 09707-x

Souza Rodrigues, M. A., Chimenti, P., & Nogueira, A. R. R. (2020). An exploration of eLearning adoption in the educational ecosystem. *Education and Information Technologies, 26*(1), 585–615. https:// doi. org/ 10. 1007/ s10639- 020- 10276-3

Tomlinson, G. F. (2019). Crowdsourcing, social media, and intercultural communication about Zika: Use contextualized research to bridge the digital divide in global health intervention. *Journal of Technical Writing and Communication, 50*(2), 141–166. https:// doi. org/ 10. 1177/ 00472 81620 906127 du

Toit, J., & Verhoef, A. H. (2018). Embodied digital technology and transformation in higher education. *Transformation in Higher Education, 3*, 8. https:// doi. org/ 10. 4102/ THE. V3I0. 52

Watkin, J. (2022). Remote learners, home makers: How digital fabrication was taught online during a pandemic. *Conference on Human Factors in Computing Systems - Proceedings*. https:// doi. org/ 10. 1145/ 34117 64. 34454 50.