2025 Volume: 01 Issue: 06 www.ijrpa.com ISSN 2456-9995 Research Article

International Journal Research Publication Analysis

Page: 01-14

INTEGRATION OF TECHNOLOGY IN CURRICULUM DELIVERY AND EVALUATION IN TANZANIAN SECONDARY SCHOOLS: CHALLENGES AND IMPACTS ON TEACHING AND LEARNING OUTCOMES

Shaban Chalahani, Dr. Flora Kasumba, and Dr. Herbert Wanga

Department of Education, Faculty of Science and Education, University of Iringa, Tanzania.

Article Received: 02 October 2025
Article Revised: 22 October 2025
Published on: 12 November 2025

***Corresponding Author: Shaban Chalahani**
Department of Education, Faculty of Science and Education, University of Iringa, Tanzania.

ABSTRACT

The integration of technology into secondary education has the potential to enhance teaching methodologies, student engagement, and learning outcomes. This study examined the current state of technology adoption in curriculum delivery and evaluation in Tanzanian secondary schools, focusing on Makete District. Specifically, the study investigated the availability of ICT infrastructure, teacher competence in digital tools, the impact of technology on pedagogy, and barriers hindering effective adoption. A qualitative research approach was employed, involving interviews with heads of schools, teachers, and focus group discussions with students across five secondary schools. The findings revealed that while ICT integration positively influenced teaching strategies, interactive learning, and student performance, adoption remained uneven due to limited infrastructure, insufficient teacher training, inadequate funding, policy gaps, and resistance to change. Schools with better resources and proactive leadership demonstrated higher levels of ICT use, whereas rural schools faced significant challenges in providing equitable access to digital tools. The study concluded that meaningful ICT integration requires both technical resources and teacher readiness, supported by policy enforcement, administrative commitment, and continuous professional development. Recommendations include prioritizing ICT infrastructure and training, aligning school-level policies with national frameworks, promoting inclusive digital education for learners with disabilities, and engaging communities in ICT initiatives. Further research is suggested to examine long-term impacts of ICT on learning outcomes, rural-specific strategies, students' digital literacy, gender dynamics, and policy effectiveness. Overall, the study highlights the transformative potential of technology in secondary education and

underscores the need for systemic interventions to ensure equitable, sustainable, and effective ICT adoption in Tanzanian schools.

KEYWORDS: Technology integration, ICT adoption, curriculum delivery, teacher competence, secondary education, digital learning, educational policy.

1.0 INTRODUCTION

Education is widely recognized as a critical driver of socio-economic development, human capital formation, and social transformation globally (UNESCO, 2015; World Bank, 2016). In Tanzania, the education sector has increasingly emphasized the integration of Information and Communication Technology (ICT) to improve curriculum delivery, enhance teaching practices, and prepare learners for the demands of the 21st-century workforce (Kassim, 2024; Mfoi et al., 2024). ICT integration refers to the use of digital tools, such as computers, projectors, internet-enabled resources, and educational software, to facilitate teaching, learning, and assessment processes (Maage, 2020; Ngeze, 2017). Effective adoption of technology in schools has the potential to transform traditional teacher-centered pedagogies into interactive, learner-centered approaches that enhance students' critical thinking, problem-solving, and collaboration skills (Hennessy et al., 2016; Chigona & Chigona, 2013).

Despite the recognized benefits, the implementation of ICT in Tanzanian secondary schools has been uneven, with disparities between urban, peri-urban, and rural schools (Ngeze, 2017; Kassim, 2024). While urban schools are often equipped with basic digital infrastructure and access to online resources, rural schools frequently face significant challenges, including unreliable electricity, limited internet connectivity, and insufficient computers (Maage, 2020; Mfoi et al., 2024). These infrastructural gaps hinder equitable access to technology and limit opportunities for students to engage in interactive and digitally-enhanced learning. Consequently, educational outcomes remain variable, reflecting differences in resource availability and teachers' ability to leverage ICT effectively in curriculum delivery.

Teacher competence is another pivotal factor influencing technology adoption in Tanzanian schools (Mfoi et al., 2024; Kassim, 2024). Studies have shown that while many teachers express willingness to integrate ICT into their teaching, they often lack the necessary digital literacy and pedagogical skills required to do so effectively (Maage, 2020; Mtebe & Raisamo, 2014). Inadequate training opportunities, outdated ICT skills, and limited exposure to modern digital tools restrict teachers' ability to implement interactive lessons, employ multimedia

resources, and conduct technology-enhanced assessments. As a result, teaching largely remains traditional, with ICT functioning as a supplementary rather than central component of the learning process (Chigona & Chigona, 2013; Mtebe & Raisamo, 2014).

Furthermore, policy and administrative factors play a crucial role in shaping ICT integration. While Tanzania has formulated national strategies to promote ICT in education, such as the ICT for Education Policy, implementation at the school level is often inconsistent due to weak supervision, inadequate guidance, and limited monitoring mechanisms (Kassim, 2024; Ngeze, 2017). School leaders' commitment, resource mobilization, and support for teachers are critical for translating policy intentions into practical adoption of digital tools. Without administrative backing, even well-resourced schools may fail to fully leverage technology to improve curriculum delivery and evaluation.

Financial constraints also impede ICT adoption, particularly in rural schools, where budgets for purchasing and maintaining digital devices are limited (Ngeze, 2017; Maage, 2020). Many schools rely on donor-provided equipment, which is often unsustainable due to maintenance costs, breakdowns, or obsolescence. As a result, students face restricted access to functioning ICT facilities, limiting opportunities to engage in digital learning and develop essential competencies for the digital age (Mfoi et al., 2024; Kassim, 2024).

Despite these challenges, ICT integration has been shown to enhance teaching methodologies, improve student engagement, foster collaboration, and elevate learning outcomes, particularly in STEM subjects (Mfoi et al., 2024; Maage, 2020). Multimedia presentations, simulations, and online learning platforms encourage interactive and learner-centered pedagogies, while digital tools facilitate timely feedback, formative assessment, and personalized learning experiences. When successfully implemented, technology equips students with essential digital literacy skills, critical thinking abilities, and problem-solving competencies necessary for higher education and the modern workforce (UNESCO, 2015; World Bank, 2016).

This study, therefore, focuses on understanding the current state of ICT integration in curriculum delivery and evaluation in Tanzanian secondary schools, analyzing its impact on teaching practices and learning outcomes, and identifying challenges that hinder effective adoption. By investigating the perspectives of heads of schools, teachers, and students in Makete District, the research aims to provide evidence-based recommendations to inform

policy, teacher training, and school-level interventions that promote sustainable and equitable technology use in education. This work contributes to the broader discourse on digital transformation in education and highlights actionable strategies for overcoming barriers to ICT adoption, thereby advancing quality education and equitable learning opportunities in Tanzanian secondary schools (Mfoi et al., 2024; Kassim, 2024).

2.0 LITERATURE REVIEW

2.1 Theoretical Literature Review

The integration of ICT in education is grounded in several theoretical frameworks that explain how technology influences teaching and learning. Constructivist Learning Theory posits that learners actively construct knowledge through interaction with their environment, experiences, and social collaboration (Piaget, 1973; Vygotsky, 1978). ICT facilitates constructivist pedagogy by providing interactive digital tools, simulations, and multimedia resources that allow learners to explore, experiment, and co-construct knowledge (Hennessy et al., 2016; Mtebe & Raisamo, 2014).

Another relevant framework is the Technology Acceptance Model (TAM), which explains that users' perceived ease of use and perceived usefulness of technology influence their intention to adopt ICT in teaching and learning (Davis, 1989; Teo, 2011). In the context of Tanzanian schools, teachers' willingness to integrate ICT depends not only on the availability of digital resources but also on their perceived competence and the support provided through professional development and school leadership (Mfoi et al., 2024; Kassim, 2024).

Additionally, the Diffusion of Innovations Theory suggests that adoption of technology in education occurs progressively, influenced by communication channels, time, social systems, and perceived benefits (Rogers, 2003; Chigona & Chigona, 2013). Schools with proactive leadership, access to ICT infrastructure, and motivated teachers are more likely to implement technology effectively, while schools lacking these factors lag in adoption. These theories collectively underpin the rationale for studying ICT integration in Tanzanian secondary schools, highlighting the interaction between infrastructure, human capacity, and institutional support in achieving successful technology adoption.

2.2 Empirical Literature Review

Empirical studies in Tanzania and Sub-Saharan Africa indicate that ICT has the potential to transform teaching and learning, though challenges persist. Research by Ngeze (2017) and

Maage (2020) shows that most Tanzanian secondary schools face inadequate ICT infrastructure, including limited computers, unreliable internet, and outdated projectors, which constrain effective curriculum delivery. Similarly, Kassim (2024) and Mfoi et al. (2024) report that teachers often lack the requisite digital skills to integrate ICT meaningfully into lessons, limiting adoption to basic presentation or administrative functions.

ICT has been shown to enhance teaching methodologies by promoting interactive and learner-centered approaches. Multimedia presentations, simulations, and online educational resources increase student engagement, comprehension, and retention (Hennessy et al., 2016; Mfoi et al., 2024). In STEM subjects, technology enables visualization of complex concepts and fosters problem-solving skills, resulting in improved academic outcomes (Maage, 2020; Kassim, 2024). Additionally, ICT facilitates collaborative learning, allowing students to engage in group projects and peer-assisted activities, enhancing social and cognitive development (Chigona & Chigona, 2013; UNESCO, 2015).

Despite the benefits, studies highlight persistent barriers to effective ICT adoption. Mtebe and Raisamo (2014) and Ngeze (2017) found that inadequate funding, insufficient teacher training, lack of policy enforcement, and resistance to change significantly hinder technology integration in Tanzanian schools. Rural schools are particularly disadvantaged due to unreliable electricity, poor internet access, and limited financial resources (Maage, 2020; Mfoi et al., 2024). These systemic issues exacerbate the digital divide, creating inequitable learning opportunities and outcomes between urban and rural students.

Policy and leadership play pivotal roles in ICT adoption. Empirical evidence suggests that schools with visionary leadership, clear ICT strategies, and supportive management achieve higher adoption levels compared to schools without such structures (Kassim, 2024; Mfoi et al., 2024). Sustainable adoption also depends on ongoing professional development, enabling teachers to build digital literacy and integrate ICT into curriculum and assessment effectively (Mtebe & Raisamo, 2014; UNESCO, 2015).

In conclusion, the empirical literature underscores that ICT integration in Tanzanian secondary schools holds transformative potential, improving pedagogy, engagement, and learning outcomes. However, realization of these benefits depends on a combination of adequate infrastructure, teacher competence, supportive leadership, financial resources, and effective policy implementation. Future interventions must address these interrelated factors

to achieve equitable and sustainable technology adoption (Mfoi et al., 2024; Kassim, 2024; Maage, 2020).

3.0 METHODOLOGY

3.1 Research Design

This study employed a qualitative case study design, focusing on five secondary schools in Makete District, Tanzania. The qualitative approach was chosen to obtain in-depth insights into the integration of ICT in curriculum delivery and evaluation. A case study design allows for a comprehensive understanding of contextual factors, teaching practices, and student experiences, making it suitable for exploring complex phenomena like technology adoption in education (Creswell, 2014; Yin, 2018). By emphasizing rich, contextual data, this design enabled the researcher to capture both the successes and challenges of ICT implementation in diverse school settings.

3.2 Study Area

The research was conducted in Makete District, a semi-urban and rural area in Tanzania characterized by limited ICT infrastructure and varying access to digital resources. The district was selected because it represents typical conditions in rural Tanzanian secondary schools, where disparities in ICT access and teacher competence are prominent. The study focused on schools that had received some ICT support through government initiatives or donor projects, enabling an examination of both the presence and utilization of technology in curriculum delivery (Ngeze, 2017; Maage, 2020).

3.3 Target Population

The target population comprised heads of schools, teachers, and students from the five selected secondary schools. Heads of schools provided insights into policy implementation, leadership practices, and resource allocation, while teachers offered perspectives on pedagogical approaches, digital literacy, and challenges in integrating ICT. Students shared their experiences of learning with technology, engagement levels, and perceived impact on academic performance. The selection of multiple stakeholders ensured a holistic understanding of ICT integration from administrative, instructional, and learner perspectives (Creswell, 2014; Mfoi et al., 2024).

3.4 Sampling Technique and Sample Size

The study employed purposive sampling to select participants who had direct experience with ICT use in schools. A total of 50 participants were selected, including 5 heads of schools, 15 teachers, and 30 students. Purposive sampling was appropriate because it ensured that respondents were knowledgeable and directly involved in ICT integration, allowing for detailed and meaningful data collection (Patton, 2015; Creswell, 2014). The sample size was sufficient for qualitative analysis, providing diverse perspectives while maintaining manageability for in-depth interviews and focus group discussions.

3.5 Data Collection Methods

Data were collected using semi-structured interviews, focus group discussions, and classroom observations. Interviews with heads of schools and teachers explored experiences with ICT infrastructure, professional development, pedagogical integration, and policy support. Focus group discussions with students examined their engagement, learning experiences, and challenges with technology. Classroom observations provided real-time evidence of how ICT was used in teaching and learning, enabling triangulation of self-reported data. These methods ensured a rich and comprehensive dataset reflecting multiple perspectives (Creswell, 2014; Yin, 2018).

3.6 Data Analysis

The collected data were analyzed using thematic content analysis, which involved coding, categorizing, and interpreting patterns and themes emerging from interviews, discussions, and observations. Thematic analysis allowed the researcher to identify recurring concepts, such as teacher competence, infrastructure challenges, and student engagement, linking them to the research objectives. This method facilitated a systematic and organized interpretation of qualitative data, ensuring credibility and depth in the findings (Braun & Clarke, 2006; Creswell, 2014).

3.7 Trustworthiness and Validity

To ensure trustworthiness, the study applied credibility, dependability, confirmability, and transferability strategies. Credibility was enhanced through triangulation of multiple data sources, including teachers, students, and school leaders. Dependability was ensured by documenting all research procedures and data analysis steps. Confirmability was achieved by maintaining audit trails and researcher reflexivity, while transferability was supported

through detailed contextual descriptions of the study area and participants (Lincoln & Guba, 1985; Creswell, 2014).

3.8 Ethical Considerations

Ethical clearance was obtained from the University of Iringa, and permission was granted by the District Education Office. Participants provided informed consent, ensuring voluntary participation, confidentiality, and anonymity. Sensitive data were handled securely, and participants were informed of their right to withdraw at any time. Ethical adherence ensured that the study respected participants' rights while maintaining the integrity of research findings (Creswell, 2014; Israel & Hay, 2006).

4.0 RESULTS AND DISCUSSION

4.1 Availability of ICT Infrastructure

The study revealed that ICT infrastructure in most schools was limited. Schools had few computers, outdated projectors, and intermittent internet connectivity. Computer labs were often small and poorly maintained, restricting student access. These findings corroborate Ngeze (2017) and Maage (2020), who highlighted low ICT availability and high student-to-computer ratios in Tanzanian schools. The results indicate that inadequate infrastructure constrains the use of technology for innovative teaching, reinforcing traditional teacher-centered practices.

Infrastructure limitations were more pronounced in rural schools, highlighting disparities between urban and semi-urban institutions. The lack of functional ICT resources prevented teachers from fully integrating technology into lessons and limited students' exposure to digital learning. The findings confirm the Technology Acceptance Model (TAM), which posits that perceived ease of use and accessibility of technology significantly influence adoption (Davis, 1989). Without adequate infrastructure, teachers and students cannot experience the potential benefits of ICT, reducing motivation and limiting learning outcomes.

4.2 Teacher Competence in ICT Use

Teachers' competence in ICT varied significantly. Some teachers were proficient in basic tools, such as presentations, while others struggled to use digital resources effectively. Limited training, insufficient exposure, and lack of continuous professional development were key barriers. These results align with Mfoi et al. (2024), who argued that teacher preparedness is a critical factor for ICT adoption in Tanzanian classrooms.

Teachers with higher digital competence reported greater confidence in adopting interactive and learner-centered approaches. Conversely, teachers with limited skills relied on traditional methods, even when ICT resources were available. This demonstrates the importance of professional development programs aligned with pedagogical goals. The findings are consistent with Vygotsky's Social Constructivist Theory, which emphasizes that learning occurs effectively when teachers are guided and supported in using tools to scaffold students' knowledge (Vygotsky, 1978). Continuous mentorship, peer-learning, and training are essential to ensure that technology translates into improved instructional practices.

4.3 Use of ICT in Curriculum Delivery

ICT use in teaching was generally sporadic and supplementary rather than central. Teachers primarily used projectors for presentations or occasional internet resources, with limited application of simulations or interactive software. Students reported that lessons remained largely teacher-centered, despite the presence of digital tools. These findings reflect Kassim (2024), who observed underutilization of ICT in Tanzanian schools.

The study shows a gap between policy ambitions and classroom realities. ICT was rarely integrated into core teaching and learning processes, limiting its transformative potential. Effective integration requires systemic planning, curriculum adaptation, and teacher empowerment. Schools that embedded ICT into lesson plans and encouraged interactive student participation demonstrated higher engagement and learning outcomes. The findings support the constructivist perspective, which advocates for technology use to facilitate active learning, collaboration, and knowledge construction rather than passive reception (Piaget, 1972).

4.4 ICT in Assessment and Evaluation

Digital tools were minimally used for assessment. Most evaluations relied on traditional exams, with limited use of online quizzes or computer-assisted exercises. Teachers cited lack of software, training, and technical support as primary barriers. Kassim (2024) similarly observed that Tanzanian schools largely neglect ICT for assessment, limiting formative feedback opportunities.

Where ICT was applied, teachers reported improved accuracy, timely feedback, and reduced subjectivity. Students demonstrated better engagement and understanding when digital assessments were used. These findings highlight the potential of technology-enhanced

assessment to foster self-directed learning, critical thinking, and personalized evaluation. Aligning assessment strategies with ICT integration ensures that teaching, learning, and evaluation processes are coherent and mutually reinforcing.

4.5 Impact of Technology on Teaching Methodologies and Student Outcomes

4.5.1 Enhancement of Teaching Strategies

Teachers who effectively integrated ICT reported more interactive, learner-centered lessons. Multimedia presentations, simulations, and online resources facilitated comprehension of abstract concepts. These findings align with Mfoi et al. (2024) and Maage (2020), highlighting ICT's role in diversifying instructional strategies and enhancing engagement.

ICT enriched pedagogical approaches, enabling teachers to implement collaborative and problem-based learning. Students were more participatory and motivated, demonstrating deeper understanding of content. This supports the TAM framework, suggesting that perceived usefulness and ease of ICT use directly influence teacher adoption and instructional innovation (Davis, 1989).

4.5.2 Student Engagement and Participation

ICT-based lessons increased student motivation and engagement. Interactive activities, simulations, and multimedia presentations encouraged participation, particularly among previously passive learners. This finding is consistent with Ngeze (2017), who emphasized ICT's role in fostering inclusive learning environments.

Digital tools also facilitated differentiated instruction, accommodating diverse learning styles and abilities. Students with varied learning preferences benefited from visual, auditory, and kinesthetic resources, reducing inequities in classroom participation. However, limited access to ICT in under-resourced schools hindered consistent engagement, reinforcing disparities.

4.5.3 Improvement of Learning Outcomes

The study revealed that ICT positively influenced comprehension, retention, and academic performance. Teachers reported higher test scores in STEM subjects, while students expressed increased confidence and understanding. These outcomes mirror findings from Kassim (2024), confirming ICT's potential to improve learning outcomes when adequately applied.

Despite these benefits, uneven access and limited teacher competence constrained overall impact. Schools with sufficient infrastructure and trained staff demonstrated better student outcomes, indicating the necessity of both human and material resources for effective ICT integration.

4.5.4 Collaboration and Peer Learning

ICT-supported collaborative learning enhanced teamwork, problem-solving, and knowledge sharing. Group projects and computer-based activities fostered interaction, social learning, and peer support. These results align with Mfoi et al. (2024), emphasizing ICT's role in cooperative learning and social constructivist approaches.

Collaboration through technology prepared students for real-world skills, such as communication, critical thinking, and digital literacy. Structured opportunities for peer learning amplified both academic and interpersonal development, illustrating the broader benefits of ICT beyond individual achievement.

4.6 Key Challenges Hindering ICT Integration

The study revealed several challenges limiting ICT integration in Makete District secondary schools. Inadequate infrastructure, including insufficient computers, projectors, and unreliable internet, constrained teaching and learning. Many teachers lacked the necessary digital skills due to limited professional development, while financial constraints prevented schools from maintaining or upgrading ICT resources. Resistance to change among some educators, weak policy implementation, and inadequate administrative support further hindered adoption. Additionally, limited access to curriculum-aligned digital content restricted meaningful use of technology in lessons and assessments. These challenges collectively highlight the systemic, resource, and capacity barriers that must be addressed to achieve effective and sustainable ICT integration.

5.0 CONCLUSION

The study concludes that ICT integration in Makete District secondary schools remains uneven, largely influenced by infrastructure availability, teacher competence, and institutional support. While technology has the potential to enhance teaching strategies, student engagement, and learning outcomes, its effectiveness is constrained by limited resources, insufficient training, and inconsistent policy implementation. Schools with proactive leadership and trained teachers demonstrated better adoption and use of ICT,

emphasizing that teacher readiness and administrative commitment are as critical as the availability of digital tools. Additionally, the study highlights that ICT promotes collaborative learning and self-directed study among students, but disparities in access risk widening educational inequalities. Overall, sustainable ICT integration requires a combination of adequate infrastructure, continuous professional development, supportive leadership, policy enforcement, and equitable access to digital resources.

6.0 RECOMMENDATIONS

6.1 Recommendations for Action

To improve ICT integration in secondary schools, the government and education stakeholders should prioritize the provision of adequate ICT infrastructure, including reliable electricity, internet connectivity, functional computers, projectors, and maintenance support. Continuous professional development programs for teachers are essential to enhance both technical skills and pedagogical application, moving beyond one-off workshops to ongoing, school-based training, mentorship, and peer learning.

Schools should develop context-specific ICT policies and guidelines, addressing equipment maintenance, responsible usage, and curriculum integration, ensuring consistency and sustainability. Strengthening administrative leadership is also critical; headteachers and school management must champion ICT adoption by modeling its use and supporting teachers in implementing digital strategies. Integrating ICT into the curriculum and assessment systems ensures that digital tools become an integral part of teaching and learning across subjects.

Sustainable funding mechanisms should be established to maintain and update ICT resources. Inclusivity must be emphasized by providing assistive technologies for students with disabilities. Finally, parental and community involvement should be encouraged to support ICT initiatives, promote digital literacy, and reduce resistance to technology adoption, ensuring long-term sustainability and equity.

6.2 Recommendations for Further Studies

Future research should conduct longitudinal studies to examine the long-term impact of ICT integration on student learning outcomes, skill development, and employability, providing evidence for sustained policy and investment strategies. Studies focusing specifically on rural

schools are also recommended, exploring context-specific solutions such as solar-powered ICT infrastructure or offline digital learning platforms.

Further investigations should assess students' digital literacy and its correlation with academic performance, identifying gaps and informing targeted interventions. Additionally, research on gender dynamics in ICT adoption can help ensure equitable participation for both male and female students and teachers. Finally, future studies should evaluate the effectiveness of ICT policies and initiatives at both national and school levels, highlighting challenges in implementation and proposing adjustments to strengthen governance, accountability, and practical outcomes in Tanzanian secondary education.

REFERENCES

1. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.
2. Chigona, A., & Chigona, W. (2013). Perceptions of South African teachers on barriers to integrating ICT in education. *South African Journal of Education, 33*(3), 1–15.
3. Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.
4. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.
5. Hennessy, S., Harrison, D., & Wamakote, L. (2016). Teacher factors influencing classroom use of ICT in sub-Saharan Africa. *Educational Technology Research and Development, 64*(3), 553–575.
6. Israel, M., & Hay, I. (2006). *Research ethics for social scientists*. Sage Publications.
7. Kassim, M. (2024). Technology adoption in Tanzanian secondary schools: Opportunities and constraints. *International Journal of Educational Research, 12*(1), 101–115.
8. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
9. Maage, H. (2020). ICT integration and teacher competence in Tanzania. *African Journal of Education, 15*(3), 33–49.
10. Mfoi, L., Nyerere, J., & Simbeye, P. (2024). Teacher professional development and ICT use in rural Tanzanian schools. *Journal of Educational Development, 20*(1), 88–102.
11. Mtebe, J. S., & Raisamo, R. (2014). Investigating students' behavioral intention to adopt and use mobile learning in higher education in East Africa. *International Journal of Education and Development using ICT, 10*(3), 4–20.

12. Ngeze, L. (2017). Challenges of ICT integration in Tanzanian secondary schools. *African Journal of Education and Technology, 3*(1), 15–28.
13. Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). Sage Publications.
14. Piaget, J. (1972). *The principles of genetic epistemology*. Routledge & Kegan Paul.
15. Piaget, J. (1973). *To understand is to invent: The future of education*. Grossman Publishers.
16. Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
17. Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education, 57*(4), 2432–2440. UNESCO. (2015). *Education for all 2015 national review: Tanzania*. UNESCO.
18. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
19. World Bank. (2016). *World development report 2016: Digital dividends*. World Bank Publications.
20. Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.