IMPLEMENTATION OF INNOVATIVE TEACHING METHODS ON ENHANCING QUALITY TEACHING AND LEARNING IN SECONDARY SCHOOLS IN MOROGORO TANZANIA

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Abstract : *The phenomenon of social and technological development has brought significant changes in the world of education, particularly in teaching practices. However, in Tanzania, the adoption of innovative teaching methods in secondary schools is still limited. This study aims to explore teachers' awareness of innovative teaching methods and their application in the context of secondary education in Morogoro, Tanzania. The research approach used is qualitative, aimed at understanding the patterns of innovative method usage and the factors influencing them. The research results show that most teachers have theoretical awareness of innovative teaching methods, such as blended learning and mobile learning, but their implementation is still low due to infrastructure and training limitations. Students acknowledge that these methods enhance engagement and flexibility in learning, although their implementation is not yet uniform across all schools. Thus, it can be concluded that there is an urgency for the professional development of teachers through continuous training and the provision of adequate infrastructure to support the implementation of innovative teaching methods.*

Keywords : *Innovative Teaching; Quality; Method.*

Abstrak : *Fenomena perkembangan sosial dan teknologi telah membawa perubahan signifikan dalam dunia pendidikan, khususnya pada praktik pengajaran. Namun, di Tanzania, adopsi metode pengajaran inovatif di sekolah menengah masih terbatas. Penelitian ini bertujuan untuk mengeksplorasi tingkat kesadaran guru terhadap metode pengajaran inovatif dan penerapannya dalam konteks pendidikan menengah di Morogoro, Tanzania. Pendekatan penelitian yang digunakan adalah kualitatif yang bertujuan untuk memahami pola penggunaan metode inovatif dan faktor-faktor yang memengaruhinya. Hasil penelitian menunjukkan bahwa sebagian besar guru memiliki kesadaran teoretis terhadap metode pengajaran inovatif, seperti blended learning dan mobile learning, tetapi implementasinya masih rendah akibat keterbatasan infrastruktur dan pelatihan. Siswa mengakui bahwa metode ini meningkatkan keterlibatan dan fleksibilitas dalam pembelajaran, meskipun penerapannya belum merata di semua sekolah. Dengan demikian dapat disimpulkan urgensi pengembangan profesional guru melalui pelatihan berkelanjutan dan penyediaan infrastruktur yang memadai untuk mendukung implementasi metode pengajaran inovatif.*

Kata Kunci : *Pengajaran Inovatif; Kualitas; Metode.*

INTRODUCTION

Phenomenon of social and technological developments have brought significant changes to the world of education, especially in teaching practices. At the global level, education is increasingly shifting from traditional rote-based methods to approaches that encourage higher-order thinking skills, effective communication, and learner autonomy (Scott, 2023). In developing countries like Tanzania, although the adoption of technology in teaching is starting to increase, the implementation of innovative teaching methods in secondary schools is still limited. Data shows that although some schools have been equipped with technological devices such as computers and projectors, their utilization in teaching remains low (Komarudin et al., 2019). This phenomenon reflects the disparity between the potential of educational technology and existing practices, which results in the lack of quality student learning in Tanzania.

Previous research has examined the application of innovative teaching methods in various contexts. For example, a study in Malaysia showed the successful integration of technology through the Malaysian Smart Schools program (Liaw et al., 2020), while in Singapore, future schools like Ngee-Ann Secondary School prioritize the use of digital devices and 21st-century skills (Kaur & Singh, 2021). In Tanzania, although information and communication technology (ICT) policies have been introduced since 2007 (Kambuga et al., 2015), research by Koomar et al. (2022) shows that most secondary schools still rely on traditional methods. However, conflicting findings from the study by Patrobas, Machumu, and Mtawa (2023) indicate that some teachers have begun using innovative technology in their teaching. This research is different because it focuses on an in-depth analysis of the level of awareness and patterns of teachers using innovative teaching methods in secondary schools in Morogoro, Tanzania, thus offering a new perspective compared to previous studies.

The main objective of this research is to investigate teachers' awareness of innovative teaching methods and how they apply them in the context of secondary education in Morogoro, Tanzania. By focusing on the direct experiences of teachers and students, this research aims to identify gaps in the utilization of educational technology and provide relevant recommendations to improve the quality of learning. Unlike previous research that tends to provide a general overview of technology usage, this study emphasizes the local context and the relevance of locally designed teaching methods.

Most teachers at Morogoro High School have a good understanding of innovative teaching methods, but their implementation is still low. Teachers and students agree that these methods, such as blended learning and mobile learning, can enhance student engagement and flexibility in learning (H. J. Machumu et al., 2016). In Tanzania, innovative teaching methods are enshrined in the ICT technology policy introduced in 2007 (Kambuga

et al., 2015). ICT is taught as a subject in primary and secondary schools, teacher training education colleges, and adult education institutes using modern ICT tools (Bucea-Manea-ţoniş et al., 2022). The curriculum emphasizes that educational technology should be taught as a subject and integrated as a tool for teaching and learning in primary and secondary schools (Kambuga & Dadi, 2015). Regardless of the efforts outlined to introduce innovative teaching methods, traditional teaching methods persist in Tanzanian secondary schools. This reliance on outdated methods contributes to students' failure to acquire essential skills (Kambuga & Dadi, 2015; H. Machumu et al., 2018; Mtebe & Raphael, 2018; Vavrus & Bartlett, 2012).

Innovative technology-based teaching approaches theoretically align with constructivist theory, which prioritizes active and collaborative learning to enhance student comprehension and engagement (Husna et al., 2023; Zielezinski & Darling-Hammond, 2018). These strategies promote knowledge acquisition through engagement, exploration, and the practical application of concepts in real-world scenarios. Nonetheless, their execution presents obstacles. Insufficient resources, including poor access to technical tools and infrastructure, continue to be a pervasive problem in numerous Tanzanian secondary schools. Furthermore, insufficient teacher training and professional growth in the integration of technology into education impede the efficacy of these strategies. A notable concern is the possibility of technology serving as a distraction, as students may utilize smartphones for non-academic activities (Alhumaid, 2019). This study, beyond the mere identification of technology usage patterns in classrooms, explores the intricate intricacies associated with the acceptance and practical deployment of educational technologies within the distinct Tanzanian environment.

METHOD

This research was conducted in a secondary school in Morogoro, Tanzania, which has unique characteristics in the context of technology use in education. Morogoro is one of the regions with relatively advanced educational development in Tanzania, yet it still faces significant challenges in the implementation of innovative teaching methods. Schools in this region, although equipped with technological devices such as computers and projectors, tend not to utilize them optimally. The uniqueness of this location provides an opportunity to explore in depth the gap between the availability of technological resources and actual teaching practices.

A qualitative approach is used in this research to gain an in-depth understanding of the experiences and perspectives of teachers and students regarding innovative teaching methods. Case studies were chosen because they allow for a detailed exploration of the specific phenomena occurring at Morogoro High School. This approach is relevant because

it focuses on a unique local context, allowing researchers to explore patterns of technology use and implementation challenges in a specific educational environment. Meanwhile, the primary sources of information in this study are high school teachers and students in Morogoro. A total of 11 teachers and 26 students were selected through purposive sampling and cluster sampling techniques to ensure adequate representation of various subjects and experiences relevant to the use of technology in teaching.

Data were collected through semi-structured interviews designed to explore the experiences, awareness, and views of teachers and students regarding innovative teaching methods. These interviews allow researchers to obtain in-depth information that cannot be reached through surveys or other quantitative methods. The collected data were analyzed using the Miles and Huberman interactive analysis model, which involves three main steps: data reduction, data presentation, and conclusion drawing (Huberman & Miles, 2002). Data reduction is carried out by sorting and summarizing interview data to focus on relevant information. Data presentation is done in the form of tables, diagrams, and thematic narratives to help researchers understand patterns and relationships within the data. Conclusions are then drawn based on the analysis results that reflect the main findings of the research. This approach allows for systematic and in-depth analysis, providing rich insights into the complexities of technology implementation in teaching in Morogoro.

RESULT AND DISCUSSION

This section presents the findings and discussion on teachers' awareness and use of innovative teaching methods in selected secondary schools. The analysis integrates data derived from interviews, tables, and matrices to provide a comprehensive understanding. These findings are further interpreted to answer the overarching research questions and offer insight into the implications of the results.

1. Awareness of Innovative Teaching Methods

Teachers' awareness of innovative teaching methods in secondary schools in Morogoro, Tanzania, shows significant variations in understanding. Most teachers understand innovative teaching methods as an approach that integrates technology and focuses on student-centered learning. In an interview, a teacher from School B (T4) stated, "*This method allows students to learn in different environments, using tools like ICT to access learning materials both inside and outside the classroom*." This statement reflects a fundamental understanding of the role of technology in creating more flexible and interactive learning experiences. These findings indicate that most teachers have theoretical awareness, but the level of practical application varies greatly. In this case, knowledge alone is not enough without access to adequate training and infrastructure to support the effective implementation of these methods in the learning environment.

However, the depth of understanding of these innovative methods varies greatly among teachers. Teachers in schools with adequate resources, such as computer labs and internet access, demonstrate better understanding and application, including the use of methods like e-learning and blended learning. On the other hand, teachers in schools lacking facilities, such as a Kiswahili subject teacher (T5), not only have a poor understanding of the concept but also lack practical experience in its application. This shows that awareness of innovative methods often depends on the availability of supporting infrastructure and training. This disparity becomes a significant obstacle affecting teachers' ability to utilize technology in their teaching, necessitating more inclusive educational policies.

From the data presented in Table 1, it can be seen that 85% of teachers express their awareness of innovative teaching methods, but only 65% are able to provide concrete examples or explain the implementation strategies. This discrepancy indicates that although there is theoretical understanding, its application remains a challenge. Teachers who are less trained or have limited access to specialized training tend to only have a superficial understanding of the concepts without knowing how to integrate them into daily teaching practices. Therefore, continuous training programs are needed that not only emphasize theoretical understanding but also provide practical skills to teachers in using innovative methods in various educational contexts.

Furthermore, the interview data patterns indicate that awareness of innovative methods is more prevalent among teachers who teach science and technology subjects compared to those who teach humanities subjects. This may be due to the perception that technology is more relevant to STEM disciplines (science, technology, engineering, and mathematics), leading humanities teachers to feel less encouraged or less inclined to adopt similar methods. To address this disparity, training designed explicitly for humanities teachers needs to be conducted so that all teachers, regardless of their field of study, have equal capabilities in applying innovative teaching methods that support holistic student learning.

Furthermore, interviews with students also revealed that they observed their teachers using innovative teaching methods, although some students had difficulty explaining the technical terms of these methods. Most students stated that methods such as blended learning and e-learning have made their learning easier, especially during the COVID-19 pandemic. A student from School A (Student X) commented, "*Our teacher teaches us in the computer lab, or even assigns tasks through email or our phones.*" This perspective indicates that although students understand the practical benefits of innovative methods, there is a need to improve communication and training for teachers to ensure that these methods can be better explained to students.

By examining these findings, awareness of innovative teaching methods among teachers and students becomes an important element in improving the quality of education in Tanzania. The interpretation of these results emphasizes that technology has played an important role in promoting more interactive and collaborative learning, yet infrastructure and training challenges remain the main obstacles. Therefore, the recommendation from this research is the importance of developing policies that ensure the equitable distribution of resources, including intensive training for all teachers in various disciplines. In this way, the gap in the implementation of innovative teaching methods can be addressed, and the overall quality of education can be improved.

2. **Application of Innovative Teaching Methods**

The implementation of innovative pedagogical approaches by secondary school educators in Morogoro, Tanzania, demonstrates a promising trend, albeit with certain problems yet to be addressed. The majority of educators indicated use a blend of conventional instructional techniques alongside digital resources to augment students' learning experiences. A biology instructor from School B (T10) stated, "*In my pedagogy, I integrate conventional techniques with videos, images, and audio.*" Students additionally exchange resources online, enhancing the interactivity and engagement of the learning experience. This method demonstrates how educators are attempting to utilize technology to foster more dynamic learning experiences, however infrastructural and training limitations continue to impede its implementation in certain circumstances.

Table 1: Utilization of Innovative Teaching Methods by Educators

Methodology	Percentage of Educators Using It	Description	Impact
Blended Learning	70%	Combining face-to-face teaching with online educational materials, such as videos, digital courses, and virtual discussions.	Used in science and math subjects to enrich students' learning experiences.
Mobile Learning	60%	Using mobile devices to deliver assignments or educational materials to students.	A student from School A said that assignments and materials were provided via email or mobile phone, allowing for learning outside the classroom.

Table 2 indicates that 70% of educators identified blended learning as their predominant methodology. This approach facilitates the amalgamation of in-person instruction with online educational materials, including video lectures, digital courses, and virtual discussions. Educators utilize these instruments to introduce diversity in the instructional and learning experience, particularly in the disciplines of science and mathematics. Moreover, 60% of educators utilize mobile learning to disseminate assignments or educational resources to pupils. A student from School A (Student X) remarked, "*Our instructors distribute assignments and resources through email or mobile phone, enabling us to study beyond the classroom*." This discovery underscores how technology has broadened students' learning environments beyond the physical limitations of the classroom.

While the trend of using innovative methods shows significant progress, the data also reveals that there are gaps in the implementation of technology in certain schools. Around 30% of teachers still rely entirely on traditional methods, such as lectures and the use of textbooks. The main reasons given were lack of training in the use of technology and limited access to ICT (Information and Communication Technology) devices. These teachers feel that they do not have adequate skills or adequate infrastructure to support the use of innovative methods. This gap is a challenge that requires serious attention, mainly to ensure that all schools have equal opportunities to adopt technology as part of their teaching strategies. Further analysis of the interview data shows that teachers who use innovative methods not only increase student engagement but also improve their learning outcomes. For example, students reported that the use of multimedia in learning helped them understand complex material more efficiently. Teachers who use technology tend to assign project-based assignments that involve online information searches, group discussions, and multimedia presentations. This not only encourages students to be more active in their learning but also helps them develop 21st-century skills, such as critical thinking, communication, and collaboration. Teachers who are skilled at integrating technology into their teaching also tend to create more inclusive and adaptive learning environments.

However, differences in resources between schools remain a significant barrier to the equitable adoption of innovative methods. Schools with better access to ICT tools, such as computer labs and internet connections, showed higher adoption rates of innovative methods compared to schools lacking such facilities. Teachers from schools with limited resources expressed that they often had to rely on their creativity to adapt traditional methods to make them more engaging for students. This suggests that despite the desire to implement innovative methods, infrastructure support remains a critical factor in the successful adoption of technology in teaching.

Furthermore, ongoing training for teachers is an urgent need to address the gap in the adoption of innovative teaching methods. Many teachers expressed the need for more practical training on how to use technology effectively in teaching. In addition, they also need technical support to address issues that may arise when using ICT tools. This training should be designed to not only improve technical skills but also help teachers understand how technology can be used to support a variety of pedagogical approaches that are appropriate to the needs of students in the digital age. Interpretation of these findings confirms that the implementation of innovative teaching methods has great potential to improve the quality of learning in Tanzania. However, to fully realize this potential, more focused interventions are needed, including the provision of adequate ICT devices, ongoing training for teachers, and education policies that support technology integration in all schools. By ensuring that all teachers have equal access to resources and training, the education system can create a learning environment that is more inclusive, dynamic, and relevant to the demands of the 21st century.

These findings also provide important insights for policymakers on the importance of supporting teachers in implementing technology as part of their teaching strategies. By providing better infrastructure, comprehensive training, and adequate technical support, the government can ensure that all students, regardless of their location or background, have equal opportunities to learn in an environment that supports their academic and social development. This will ultimately contribute significantly to improving the overall quality of education in Tanzania.
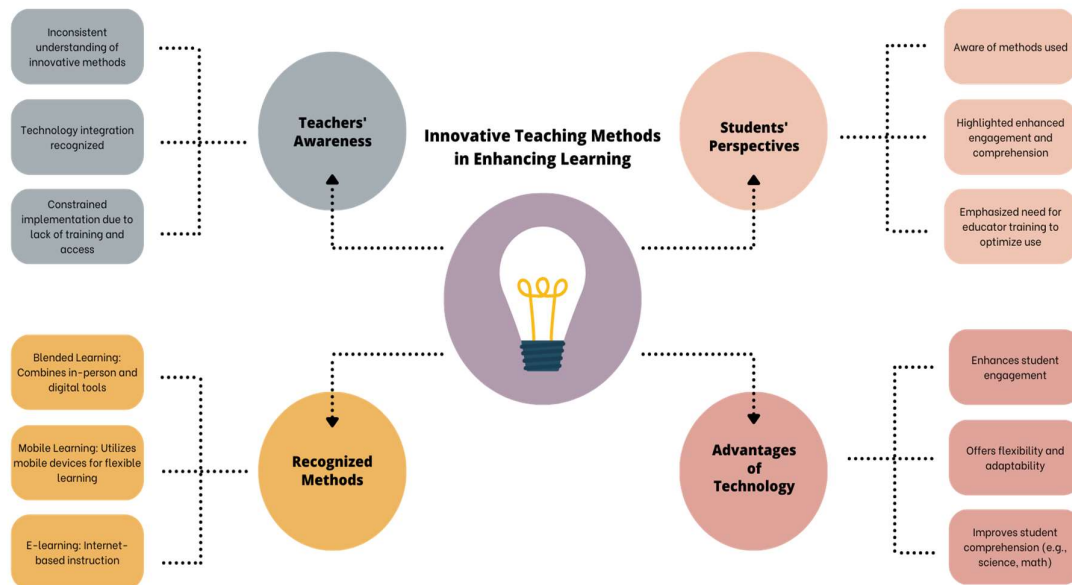

Figure 1: Innovative Teaching Methods

The research findings as figure 1, indicate that teachers' awareness of innovative teaching methods is inconsistent; nonetheless, the majority recognize that these methods involve the utilization of technology to facilitate learning in both classroom and distant settings. Educators recognized approaches, including blended learning, e-learning, and mobile learning, which utilize electronic devices and internet connectivity. These findings correspond with Ndibalema's (2020) definition of innovative methods as a synthesis of traditional ways and technology, as well as Köse's (2010) focus on the variety of educational strategies encompassing e-learning and in-person instruction (Okegbemiro, 2021). This research indicates that while some educators recognize the promise of novel methods, their implementation is constrained, particularly among those lacking sufficient access or training.

Furthermore, the students in this study demonstrated awareness of the novel techniques employed by their instructors. The utilization of technology, including the internet and mobile devices, to disseminate educational resources, particularly during the COVID-19 pandemic, exemplifies the viability of this approach (Mundiri et al., 2021). Students indicated that remote learning utilizing email and instant chat programs facilitated their continued studies despite physical constraints. This aligns with Eli's (2021) findings in Mauritania, which also highlight the necessity for further training for educators to optimize the efficacy of novel methodologies. The student's understanding of this strategy underscores the necessity to prioritize teacher training and capacity building to ensure more uniform adoption (Ab Hajis & Othman, 2024).

This research indicates that the majority of teachers have started to integrate traditional pedagogical approaches with digital technologies. Blended learning has emerged as a prevalent methodology, wherein educators integrate in-person instruction with digital learning resources, including videos, virtual discussion platforms, and interactive educational software. Educators often employ mobile devices to provide assignments and educational resources. This indicates that technology has enhanced students' educational experiences, fostering a more flexible and adaptive learning environment. This deployment remains restricted to a select number of schools with sufficient technology infrastructure.

Certain educators, particularly in institutions with constrained ICT resources, continue to depend only on conventional methodologies. This dilemma underscores the necessity of rigorous training and enhanced access to electronic equipment to facilitate the adoption of innovative pedagogical approaches. Almasi, Machumu, and Zhu (2018) assert that innovative teaching methods are not only more adaptable but also substantially enhance student engagement relative to traditional ways (Akmese & Kayhan, 2023).

Consequently, prioritisation of initiatives to enhance access and training is essential for the equitable implementation of novel technologies.

The insights gathered from the students in this study support the adoption of innovative teaching methods. Students indicated that their instructors employed strategies like blended learning and mobile learning, enabling them to engage in more flexible study practices. Students noted that their instructor distributed educational resources through email or instant messaging applications, enabling them to engage in study beyond school hours (Dangaiso et al., 2022; Zielezinski & Darling-Hammond, 2018). This indicates that students not only acknowledge the innovative approaches being applied but also experience the advantages in improving their learning journey.

Furthermore, students indicated that this approach enhances the learning experience, making it more engaging and interactive, particularly in demanding subjects such as science and mathematics (Schwendicke et al., 2020). Participants exhibit a heightened level of engagement in the learning process when utilising videos, online discussions, and interactive quizzes (Calderón et al., 2020). The recognition of this approach by students indicates that technology enhances their comprehension of the material while also reinforcing the bond between educators and learners. Students pointed out the shortcomings of certain educators who lack proficiency in technology, emphasising the necessity for additional training (Bahroun et al., 2023).

The implications of these findings for educational policies and practices are substantial. The recognition of innovative methods by educators suggests that technology holds significant promise for improving the quality of learning (Bahroun et al., 2023). Nonetheless, the constraints in execution highlight the necessity for more focused strategies, including comprehensive training for educators (Ab Hajis & Othman, 2024). Through practical training, educators can enhance the use of technology to foster an inclusive and adaptable learning atmosphere. Moreover, the application of innovative techniques indicates that the educational environment extends beyond traditional physical classrooms (Patrobas et al., 2023; Santangelo & Tomlinson, 2012). Advancements in technology have facilitated learning across diverse environments, offering students the flexibility to engage in their studies at any time and from any location. This necessitates that educational policies adopt a more inclusive approach toward the integration of technology into the learning process. Student involvement in this method also shows that they are ready to adapt to new approaches in learning. However, to ensure the effectiveness of this method, the government and educational institutions need to improve technological infrastructure in schools, especially in areas with limited access. Thus, equality in the quality of education can be achieved (Bahroun et al., 2023).

The implementation of innovative teaching methods has demonstrated a notable causal link to enhanced student engagement. The implementation of technology like blended learning has fostered a more interactive and engaging educational experience (H. Machumu et al., 2018; H. J. Machumu et al., 2016). This leads to increased motivation among students and fosters active participation in the learning process (Anderson & Putman, 2020). Nonetheless, restricted access to technology and insufficient training for educators present significant obstacles, resulting in disparities in the quality of education. This gap underscores the critical need for investment in training and technological infrastructure. Educators equipped with technological resources and proficient in their application often achieve greater success in fostering productive learning atmospheres. Conversely, educators with limited skills frequently fall back on conventional approaches that lack adaptability. This indicates that systematic and continuous training is crucial for achieving fair implementation of technology. Ensuring equitable access to technology allows schools to foster more inclusive learning environments. This enhances the educational experience for students while also reinforcing the position of educators as guides in the learning process. Allocating resources towards training and technology is essential for addressing challenges and fully harnessing the capabilities of innovative teaching approaches.

CONCLUSION

In the light of the findings and discussion of this study it can be concluded that innovative teaching methods are regarded as effective methods in dispensing knowledge and innovation by both teachers and students. Teachers, when exposed to technological facilities and pedagogical skills, have more opportunities of planning and utilizing innovative teaching methods to enhance teaching and learning. The majority of teachers were found to be aware and used different forms of innovative teaching methods. However, the limitation is that, first, only two schools were schools were selected. Secondly, the schools were selected based on an initial survey to find out some indicators of the presence of such applications, therefore, the results cannot be generalized to other schools.

Another conclusion is that students confirmed that teachers in the visited schools were aware of the innovative teaching methods and applied such methods in their teaching. However, only a few of such methods were reported by both teachers and students. As such, developing teachers professionally could help to build their capacity in utilizing technological facilities and enhancing quality teaching and learning. This study used interviews with both teachers and students to study their awareness and application of innovative teaching methods, classroom observation to confirm and find out what were methods were mostly applied could be done to shed more light on the topic.

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BIBLIOGRAPHY

Ab Hajis, S., & Othman, N. (2024). Navigating Challenges and Strategies in Implementing Differentiated Instruction: A Conceptual Overview. *International Journal of Academic Research in Business and Social Sciences*, 14(8), 766-784. https://doi.org/10.6007/ijarbss/v14-i8/22153

Akmese, P. P., & Kayhan, N. (2023). Sign language Education In Pre-School: Prospective Pre-School Teachers' Views About The Turkish Sign Language Course. *South African Journal of Education*, 43(2), 1–11. https://doi.org/10.15700/saje.v43n2a2179

Anderson, S. E., & Putman, R. S. (2020). Special Education Teachers' Experience, Confidence, Beliefs, and Knowledge About Integrating Technology. *Journal of Special Education Technology*, 35(1), 37–50. https://doi.org/10.1177/0162643419836409

Bahroun, Z., Anane, C., Ahmed, V., & Zacca, A. (2023). Transforming Education: A Comprehensive Review of Generative Artificial Intelligence in Educational Settings through Bibliometric and Content Analysis. In *Sustainability (Switzerland)*, 15(17), 1022-1036. https://doi.org/10.3390/su151712983

Bucea-Manea-ţoniş, R., Kuleto, V., Gudei, S. C. D., Lianu, C., Lianu, C., Ilić, M. P., & Păun, D. (2022). Artificial Intelligence Potential in Higher Education Institutions Enhanced Learning Environment in Romania and Serbia. *Sustainability (Switzerland)*, 14(10), 5842-5857, https://doi.org/10.3390/su14105842

Calderón, A., Meroño, L., & MacPhail, A. (2020). A Student-Centred Digital Technology Approach: The Relationship Between Intrinsic Motivation, Learning Climate and Academic Achievement of Physical Education Pre-Service Teachers. *European Physical Education Review*, 26(1), 241–262. https://doi.org/10.1177/1356336X19850852

Dangaiso, P., Makudza, F., & Hogo, H. (2022). Modelling Perceived E-Learning Service Quality, Student Satisfaction and Loyalty. A Higher Education Perspective. *Cogent Education*, 9(1), 214-229. https://doi.org/10.1080/2331186X.2022.2145805

Eka Mahmud, M., Ubaidillah, M., Azizah, N., Zuhro, L., & Hasanah, F. (2021). Learning Agility during Pandemic; Outstanding Strategy in Language Learning by Using Zoom Application. *Journal of Physics: Conference Series*, 1779(1), 12066-12073.

https://doi.org/10.1088/1742-6596/1779/1/012066

Huberman, M., & Miles, M. B. (2002). *The Qualitative Researcher's Companion*. Sage.

Husna, K. & Agus R, A. H. (2023). Improving Student Competence Through Learning Management Outcome Based Education. *PEDAGOGIK: Jurnal Pendidikan*, *10*(1), 1–14. https://doi.org/10.33650/pjp.v10i1.5516

Kambuga, Y., & Dadi, H. (2015). School Inspection in Tanzania as a Motor for Education Quality: Challenges and Possible Way Forward. *Review of Knowledge Economy*, *2*(1), 1–13. https://doi.org/10.18488/journal.67/2015.2.1/67.1.1.13

Kaur, J., & Singh, H. (2021). Smart Learning Solutions for Combating COVID-19. In *Explainable Artificial Intelligence for Smart Cities*. CRC Press. https://doi.org/10.1201/9781003172772-8

Komarudin, K., Alkhudri, A. T., Ubedilah, U., Syaifudin, S., & Casmana, A. R. (2019). The Nationality Education Model: The Implementation of a Score-A Training Model for Youth Across different Cultures in Indonesia. *Journal of Social Studies Education Research*, *10*(2), 308–322. https://jsser.org/index.php/jsser/article/view/796

Koomar, S., Hennessy, S., Zubairi, A., … R. K.-A. E., & 2022, U. (2022). Reflections on Technology, Teaching, Learning, and Professional Development: Findings from a Teacher Survey in Tanzania. *ERICS Koomar, S Hennessy, A Zubairi, R Kindoli, A KreimeiaAfrican Educational Research Journal, ERIC*, *10*(4), 342–368. https://doi.org/10.30918/AERJ.104.22.048

Liaw, S. Y., Ooi, S. W., Rusli, K. D. Bin, Lau, T. C., Tam, W. W. S., & Chua, W. L. (2020). Nurse-Physician Communication Team Training in Virtual Reality Versus Live Simulations: Randomized Controlled Trial on Team Communication and Teamwork Attitudes. *Journal of Medical Internet Research*, *22*(4), 172-189. https://doi.org/10.2196/17279

Machumu, H., Almasi, M., & Zhu, C. (2018). Context-based Blended Learning Models And Implementation In Sub- Saharan Africa: A Literature Review. *New Trends and Issues Proceedings on Humanities and Social Sciences*, *5*(1), 190–199. https://doi.org/10.18844/prosoc.v5i1.3414

Machumu, H. J., Zhu, C., & Sesabo, J. K. (2016). Blended Learning in the Vocational Education and Training System in Tanzania: Understanding Vocational Educators' Perceptions. *International Journal of Multicultural and Multireligious Understanding*, *3*(2), 30-47. https://doi.org/10.18415/ijmmu.v3i2.46

Mtebe, J. S., & Raphael, C. (2018). Key factors in learners' satisfaction with the e-learning system at the University of Dar es Salaam, Tanzania. *Australasian Journal of Educational Technology*, *34*(4), 371-384. https://doi.org/10.14742/ajet.2993

Ndibalema, K. A. (2020). *Investigating Education Stakeholders Awareness and Acceptance of Open and Distance Learning in Simiyu Region* (Doctoral dissertation, The Open University of Tanzania).

Okegbemiro, J. O. (2021). *Effects of Blended and E-Learning on Academic Achievement of Business Education Students in Word Processing* (Master's thesis, Kwara State University (Nigeria)).

Patrobas, M., Machumu, H. J., & Mtawa, N. (2023). Digital Skills and Learning in Tanzania Secondary Schools: Students and Teachers' Influence. *Qeios*.

Santangelo, T., & Tomlinson, C. A. (2012). Teacher Educators' Perceptions and Use of Differentiated Instruction Practices: An Exploratory Investigation. *Action in Teacher*

Education, *34*(4), 309–327. https://doi.org/10.1080/01626620.2012.717032

Schwendicke, F., Samek, W., & Krois, J. (2020). Artificial Intelligence in Dentistry: Chances and Challenges. *Journal of Dental Research*, *99*(7), 769–774. https://doi.org/10.1177/0022034520915714

Scott, C. L. (2023). The Futures of Learning 3: What Kind of Pedagogies for the 21st Century? *International Journal for Business Education*, *164*(1), 191-207. https://doi.org/10.30707/ijbe164.1.1690386168.68154

Vavrus, F., & Bartlett, L. (2012). Comparative Pedagogies and Epistemological Diversity: Social and Materials Contexts of Teaching in Tanzania. *Comparative Education Review*, *56*(SPL.ISS. 4), 634–658. https://doi.org/10.1086/667395

Zielezinski, M. B., & Darling-Hammond, L. (2018). Advancing Equity Through Educational Technology: Promising Practices for Adoption, Integration, and Use in K-12. In *Second Handbook of Information Technology in Primary and Secondary Education*. Springer International Publishing. https://doi.org/10.1007/978-3-319-71054-9_95