

PHILOSOPHICAL IMPLICATIONS OF THE APPLICATION OF TECHNOLOGICAL TOOLS FOR THE EFFECTIVENESS OF TERTIARY INSTITUTIONS IN MWANZA REGION, TANZANIA

By

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Abstract

This study investigates philosophical implications of the application of technological tools for the effectiveness of tertiary institution in Mwanza region Tanzania. One research questions were raised and answered. The researcher reviewed related literature in the study and adopted ex-post facto design. The population of the study was six hundred (600) students across the two universities in Mwanza region. representing 60% of the target population. 352 students were sampled using stratified random sampling technique. The instrument used for data collection was a questionnaire titled “Philosophical Implications of the Application of Technological Tools for the Effectiveness of Tertiary Institution (PIATTETI)”. Validity of the instrument was established through judgement of experts and Split Half method was used to establish the reliability. The overall reliability coefficient of 0.73 was established. 352 copies of the instrument administered were returned (Mwanza university 133 students and Dar es salaam institute of technology 219 students). The research questions were answered with mean rating and standard Deviation. Items on the instrument were scored based on the four points scoring scale using means and standard deviation. Findings in the study indicates a disconnect between the intended transformative role of technology in education and its actual impact as perceived by students. The results imply that without thoughtful philosophical implication such as aligning technological adoption with values of equity, access, and human-centered learning the application of ICT tools may not yield meaningful improvements in institutional effectiveness. Therefore, the study concludes that the current application of technological tools in tertiary institutions within the Mwanza Region lacks the necessary philosophical underpinnings to produce a positive impact, highlighting the need for a more reflective, context-aware approach to educational technology integration.

Key words: Philosophical implication, application of technological tools, and effectiveness of higher institutions.

Background of the Study

The contemporary landscape of higher education globally and particularly in developing contexts like Tanzania is increasingly shaped by the interplay between technology and educational effectiveness. At its core, the study is concerned not only with whether technological tools work, but how and why their implementation influences educational goals, values, and the deeper mission of higher education (Malale & Christopher 2021). Tertiary institutions fulfill their intended educational purpose, research, and societal mandates. It is a multi-dimensional concept that includes academic quality, graduate employability, research output, administrative efficiency, and stakeholder satisfaction (TCU, 2019). A highly effective institution is one that produces graduates who are critical thinkers, problem solvers, and contributing members of the society, aligned with national development aspirations.

In Tanzania, however, the effectiveness of tertiary institutions is under threat due to systemic challenges. These include underfunding, infrastructural decay, outdated curricula, high student-teacher ratios, and weak links between academic outputs and the labour market (Mkude, 2017; Mafu, 2021). The Tanzanian Commission for Universities (TCU) has repeatedly emphasized the need for innovation in pedagogy, administration, and curriculum delivery to overcome these limitations (TCU, 2019). Within the Mwanza Region a growing academic hub, has been identify as challenges which are magnified by geographical and socio-economic disparities, including limited internet penetration, unequal access to electricity, and high costs of digital infrastructure. The application of technological tools is gaining traction as a strategy to reimagine and improve institutional effectiveness. These tools range from e-learning platforms (LMSs like Moodle), virtual libraries, and digital administrative systems to emerging AI-driven educational assistants and mobile learning apps. The rationale is that technology can help overcome constraints in physical infrastructure, reach remote learners, improve data management, and enhance teaching and learning quality (Sife, Lwoga & Sanga, 2007). Application of technological tools is weak or poorly implemented, this is consequences of the fact that the philosophical application of digitalization is not followed accordingly. Onuwuchekwu et al. (2024) stated that digitalization significantly improves students' employability, especially when they are supported in advancing technology and fostering a scientific mindset. Ekpo et al. (2024) proposed that successful digital integration can occur through enhanced instructional delivery, which is facilitated by the use of ICT resources. Ategwu et al. (2022) contended that integrating ICT into teaching and learning does not ensure the effectiveness of higher education institutions, as it relies on the levels of availability and utilization. The effectiveness of tertiary institutions is compromised. Conversely, a strong and thoughtful integration of technology enhances instructional delivery, administrative efficiency, research innovation, and equitable access to education (Holmes et al., 2021).

The integration of technology in education is not merely a technical adjustment it is a philosophical transformation. At the epistemological level, technology changes how knowledge is created, shared, and validated. Traditional models of knowledge transmission characterized by face-to-face dialogue and mentorship are being supplemented or replaced by asynchronous, digitized formats. Plato's dialogical model of education, emphasizes the relational and dialectical nature of learning, sits in contrast with technologically-mediated learning environments that can sometimes be isolating and mechanistic.

Ontologically, the nature of the teacher-learner relationship is also changing. Technology introduces new learning identities, where students are no longer passive recipients of knowledge but active navigators of vast digital landscapes. While this democratization of access is empowering, it also demands a higher level of critical thinking and self-discipline, competencies not evenly distributed across learners, especially in under-resourced settings (Freire, 1970).

From an axiological perspective, the values embedded in technological adoption must be questioned. Whose knowledge is prioritized? What worldviews are encoded in digital platforms? Ndlovu-Gatsheni (2013) argues that, African educational systems must resist the uncritical importation of Western technologies and instead shape digital tools to reflect local values, languages, and contexts. Thus, the philosophical implications of technology in education challenge educators and policy-makers to think beyond functionality and consider the cultural, ethical, and humanistic dimensions of technological integration.

The fusion of education and technology has evolved in stages from the use of broadcast media in the 20th century to modern digital platforms and AI. The digital revolution has reshaped the architecture of higher education. Universities in developed countries have adopted Artificial Intelligence (AI), Learning Management Systems (LMS), automated research tools, and smart administration platforms to streamline operations and improve academic outcomes. Early educational technologies focused on mass instruction (e.g., radio education), while the 1990s marked a paradigm shift with the advent of the World Wide Web and online learning systems, enabling personalized and flexible education models (Selwyn, 2016). The rise of Big Data and Artificial Intelligence introduced predictive analytics and learning personalization, further altering educational practices. These technological interventions have significantly enhanced institutional effectiveness by enabling flexible learning, real-time data-driven decisions, and wider knowledge access (UNESCO, 2022). For instance, institutions in countries like the United States, Finland, and Singapore have leveraged AI in personalizing student learning experiences and predicting academic performance trends (OECD, 2020). However, this trajectory has not been value-neutral. Critics argue that educational technologies often prioritize efficiency over depth, content over context, and uniformity over diversity, sometimes reproducing colonial and capitalist ideologies under the guise of innovation (Feenberg, 1991).

Many tertiary institutions in African countries have pursued technological integration to improve institutional effectiveness. Nations like Rwanda and Kenya have advanced in building digital infrastructure, promoting online learning, and establishing supportive ICT policies. However, the success of these efforts largely hinges on institutional philosophy, leadership engagement, and local conditions such as digital literacy and socio-economic disparities (Adarkwah, 2021). While mobile phone usage and regional ICT initiatives have grown, challenges like unequal access, low digital competence, and infrastructural gaps persist (Mtebe & Raisamo, 2014). Despite this, African universities have shown adaptability by adopting mobile-first approaches and utilizing open educational resources (OER) to address learning needs. At the policy level, frameworks such as the African Union's Agenda 2063 and the Continental Education Strategy for Africa (CESA 2016–2025) highlight the transformative role of technology in education. However, these strategies also caution that technological advancement should not only aim at modernization but

must also support the decolonization and contextualization of African knowledge systems (Ndlovu-Gatsheni, 2013).

Tanzania has made commendable efforts to integrate ICT into education through the Education and Training Policy (2014) and the National ICT Policy (2016). These policies aim to increase access, equity, and quality through technology, particularly in higher education. The implementation of university-wide ICT strategies, digital libraries, and e-learning platforms is now a core expectation of tertiary institutions. These frameworks recognize the role of technology in improving teaching, learning, and institutional management. Institutions like the University of Dar es Salaam and Saint Augustine University of Tanzania have adopted e-learning platforms, academic information systems, and digital libraries. However, contextual challenges persist. Institutions in Mwanza region though benefiting from urban infrastructure still grapple with digital divides within their student populations, including disparities in device ownership, internet access, and digital competencies. For rural and economically disadvantaged students, technology may widen rather than bridge educational inequalities unless accompanied by deliberate capacity-building and support mechanisms (URT, 2016).

This study is therefore situated at the critical nexus of technological opportunity and philosophical inquiry. While technological tools are being embraced to improve the effectiveness of tertiary institutions in Mwanza, uncritical application has the risks of compromising educational values, deep learning, and contextual relevance. There is a need to explore not just how these tools are used, what are the consequences, and under what philosophical assumptions on this be achieve. The study aims to fill this gap by interrogating the philosophical implications of using technology as a strategic solution to institutional challenges. In doing so, it offers a nuanced, contextually grounded, and ethically informed understanding of educational innovation in Tanzania's higher education sector.

Statement of the Problem

Despite ongoing efforts to enhance the effectiveness of tertiary institutions in the Mwanza region, many universities and colleges continue to struggle with persistent challenges that undermine their ability to deliver quality education and meet national development goals. Key issues include inadequate infrastructure, limited access to modern educational resources, shortage of qualified academic staff, and mismatches between academic curricula and labour market demands. These challenges contribute to poor student learning outcomes, low research productivity, and reduced graduate employability. In response, technological tools such as Learning Management Systems, digital libraries, mobile learning platforms, and emerging Artificial Intelligence applications have been introduced as potential solutions to improve institutional effectiveness by enhancing teaching, learning, research, and administration. However, despite the potential of these technologies, their actual impact in the Mwanza region remains unclear and under-researched. Furthermore, the philosophical and conceptual foundations guiding the integration of technology in education including questions about the nature of knowledge, the role of technology in learning, and ethical considerations have not been adequately explored. This gap has led to inconsistent adoption and utilization of technological tools, with some institutions achieving notable improvements while others face challenges related to infrastructure deficits, digital literacy gaps, socio-economic disparities, and cultural

resistance. There is also insufficient understanding of how these tools affect the holistic effectiveness of tertiary institutions from a philosophical standpoint, which considers both practical outcomes and deeper implications for educational values and equity. Therefore, this study seeks to investigate the philosophical implications of applying technological tools to improve the effectiveness of tertiary institutions in Mwanza. It aims to uncover not only the extent and manner of technology utilization but also the underlying beliefs, values, and ethical issues that influence technology adoption and its impact on educational quality and institutional performance.

Research Objective:

1. To examine the philosophical implications of integrating technological tools in enhancing institutional effectiveness in tertiary institutions in the Mwanza Region, Tanzania.

Research Question:

1. What are the philosophical implications of applying technological tools such as ICT facilities for improving institutional effectiveness in tertiary institutions in Mwanza Region?

Empirical Literature Review

Ahmed et al. (2021) conducted a study titled “Evaluating Students’ Perspectives on ICT Readiness in Somali Higher Education Institutions” across several universities in Somalia. Using a quantitative design grounded in the Technology Acceptance Model (TAM), the study surveyed 304 students to assess their readiness and adaptability to ICT tools. The findings revealed that constructs such as perceived usefulness, ease of use, and ICT self-efficacy significantly influenced students’ readiness to adopt technological tools, while infrastructural limitations had a lesser impact. Although this study provides a solid framework for understanding student adaptability, it lacks philosophical depth. The focus remains on practical and technical readiness without engaging with how such technological integration affects educational philosophy or institutional identity.

Similarly, Soomro et al. (2022) carried out a study titled “Gender-Wise Perception of Students Towards Blended Learning as aspect of ICT: A Study in Pakistani Universities” in Sindh Province, Pakistan. The study employed a survey method involving 300 students to investigate their adaptability and attitudes towards blended learning. The results indicated high adaptability among students, who believed that blended learning improved their academic engagement and collaboration. However, barriers such as inadequate infrastructure and limited technical training were highlighted. While the findings are valuable in showing positive student adaptability, the study is limited by its instrumental focus. It does not explore the philosophical implications of technology use in education, such as ethical considerations or the transformation of knowledge production.

In the East African context, Mwangakala (2024) conducted a mixed-methods study titled “University Students’ Readiness for E-Learning Adoption in Tanzania” at the University of Dodoma. The study assessed digital literacy, attitude, and institutional support among university students. The findings revealed that students exhibited moderately high readiness for e-learning, although the degree of adaptability varied widely due to uneven digital competencies and

insufficient institutional infrastructure. This study directly contributes to understanding student adaptability in Tanzanian higher education. Nevertheless, it falls short of examining how technological adoption may reshape educational philosophies, such as the role of critical thinking or learner autonomy in digitally mediated learning environments.

Another regional study by Mgeni et al. (2024) titled “Adoption of Mobile Applications for Enhancing Learning in Higher Education in Zanzibar” focused on students at the State University of Zanzibar (SUZA). The study, involving 240 participants, utilized the TAM framework to assess the perceived usefulness and ease of use of mobile learning tools. The majority of students (96%) reported accessing academic content via mobile applications, although over half faced connectivity and affordability challenges. While the study effectively demonstrates high adaptability to mobile technology, it overlooks deeper philosophical concerns, such as whether mobile learning promotes or hinders equitable access to knowledge and the learner's intellectual development within institutional settings.

Raphael (2022) explained “Implementation of Digital Transformation in Technical Higher Education Institutions in Tanzania,” involving two technical colleges in Dar es Salaam and Arusha. With a sample of 500 third-year students, the study investigated awareness, exposure, and satisfaction with digital transformation strategies. Findings indicated low levels of engagement with digital tools and uneven awareness among students, primarily due to insufficient policy implementation and resource allocation. This study is highly relevant to student adaptability; however, it does not link technological engagement with institutional effectiveness from a philosophical standpoint, such as the redefinition of the university's mission in a digital age.

Mwakyusa (2016) investigated the “Impediments of E-Learning Adoption in Higher Learning Institutions of Tanzania,” analyzing 18 empirical studies. The findings underscored persistent challenges, including poor internet infrastructure, lack of ICT competence, and inadequate policy support. While the study provides a systemic overview of the challenges to technological adaptability in Tanzanian universities, it relies on secondary data and lacks a direct philosophical or conceptual lens. It does not engage with critical questions regarding the ethical, epistemological, or ontological consequences of technology in higher education.

Methodology

Ex-post facto design was adopted in this study. The population of the study was eight hundred and fifty (850) students across the three universities in Mwanza region. A sample of six hundred (600) students representing 60% of the population was chosen. The sample was one hundred and thirty-three (133) students in Mwanza university, two hundred and nineteen (219) Students in DIT. The stratified random sampling technique was utilized to sample the students. The instrument used for collection of data was a questionnaire titled “Philosophical Implications of the Application of Technological Tools for the Effectiveness of Tertiary Institution (PIATTETI)”. The instrument was validated through experts’ the reliability was established with Split Half method. The researcher administered the instrument to the sampled students across universities in Mwanza region. A period of one month was used for data collection. Three hundred fifty-two (352) copies representing 60% of the instrument administered were returned. The research

questions were answered with mean rating and standard deviation.

Results and Findings

What are the philosophical implications of applying technological tools such as ICT facilities for improving institutional effectiveness in tertiary institutions in Mwanza Region?

Table 1: Mean rating of respondents on the philosophical implications of applying technological tools such as ICT facilities for improving institutional effectiveness in tertiary institutions in DIT and Mwanza university.

The Level of adaptability of students to technology in DIT and Mwanza University

S/N	Items	DIT Students				Mwanza University Students			
		N	X	SD	Decision	N	X	SD	Decision
1	Technological integration often support students for inclusive education in higher education	219	2.49	0.78	-	133	2.45	1.13	-
2	Application of technological tools improves institutional effectiveness in tertiary institution	219	2.47	0.67	-	133	2.43	0.84	-
3	Inadequate ICT facilities influence effectiveness of higher institutions	219	2.44	1.21	-	133	2.37	1.13	-
4	Technological tools such as ICT facilities enhances students access to learning resources in higher education	219	2.41	1.13	-	133	2.35	1.11	-
5	Integration of technological tools enhances satisfaction of students in tertiary institution	219	2.39	0.68	-	133	2.31	0.87	-
6	ICT facilities has saved students time in higher institution	219	2.31	1.03	-	133	2.23	1.23	-
7	overdependence of technological tools by students affects critical thinking in higher institution	219	2.27	0.79	-	133	2.21	1.13	-
8	Inequalities in access to digital tools affects students effectiveness in higher education	219	2.18	1.13	-	133	2.13	1.09	-
9	Uses of digital tools often lead to distractions during	219	2.15	0.89	-	133	2.11	1.13	-

	academic activities								
10	ICT facilities improve communication between students and lecturers through email and LMS	219	2.33	0.93	-	133	2.28	1.06	-
Grand Mean		219	2.23	0.93	-	133	2.17	0.89	-

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Using the data in table 1 and the mean rating from items 1 to 10, the followings were observed. The sample for DIT students was 219 with mean rating of 2.33 and standard deviation of 0.93 while the sample for Mwanza university students was 133 with mean rating of 2.28 and standard deviation of 1.06. Using the standard level of acceptance for the study as 2.50, the ratings of Mwanza university and DIT Students were lower than the criterion level of acceptance. This implied that philosophical application of technology in terms of ICT facilities has negative influence on the level of effectiveness of higher institution in Mwanza region as the ratings were lower than the criterion level of acceptance.

Discussion of results

What are the philosophical implications of utilizing technological tools, such as ICT facilities, to enhance institutional effectiveness in tertiary institutions in the Mwanza Region? According to the data in Table 1, the sample of DIT students consisted of 219 individuals with a mean rating of 2.33 and a standard deviation of 0.93. The sample from Mwanza University included 133 students, yielding a mean rating of 2.28 and a standard deviation of 1.06. Given the standard acceptance level for this study was set at 2.50, both DIT and Mwanza University students rated below this threshold. This suggests that the application of technological tools negatively impacted institutional effectiveness in tertiary education in Mwanza Region, Tanzania. The findings indicate that there were no significant philosophical influences from applying ICT facilities, as the ratings fell short of the acceptance criterion. This aligns with the findings by Mwakyusa and Mwalyagile (2016), which highlighted obstacles to e-learning adoption in Tanzanian higher education. It was discovered that despite efforts to implement digital tools, challenges such as inadequate facilities, limited ICT skills among faculty and students, poor infrastructure, and policy deficiencies significantly constrained the educational benefits of these technological initiatives. These structural and philosophical barriers has not only impeded the practical use of ICT tools but also obstructed their meaningful integration into the value of higher education institutions.

Conclusion

The study set out to examine the philosophical implications of integrating technological tools, particularly ICT facilities, in enhancing institutional effectiveness in tertiary institutions in the Mwanza Region, Tanzania. Philosophically, this indicates a disconnect between the intended transformative role of technology in education and its actual impact as perceived by students. The results imply that without thoughtful philosophical grounding such as aligning technological

adoption with values of equity, access, and human-centered learning the application of ICT tools may not yield meaningful improvements in institutional effectiveness. Therefore, the study concludes that the current application of technological tools in tertiary institutions within the Mwanza Region lacks the necessary philosophical underpinnings to produce a positive impact, highlighting the need for a more reflective, context-aware approach to educational technology integration.

Recommendations

As part of recommendation for this study, there should be a need for capacity-building programs for both students and staff to improve their digital literacy and foster a positive attitude towards technology use in education.

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