Digital Transformation in Higher Education: Challenges and Opportunities for University Administration and Academic Work—A Case Study of Bolgatanga Technical University

Baba Blonch Adombilla
Bolgatanga Technical University, Ghana
Department of Business Administration and Management
Email: bablonch@gmail.com
ORCID ID: https://orcid.org/0009-0006-4971-2369

Samuel Adadi Akapule
Bolgatanga Technical University, Ghana
Department of Marketing and Communication
Email: sakapule@bolgatu.edu.gh
ORCID ID: https://orcid.org/0009-0008-6641-0965

Abstract

This study explored the challenges and opportunities associated with digital transformation in academic and administrative work at Bolgatanga Technical University, Ghana. Anchored on the Technology Acceptance Model, it employed a qualitative case study design to examine staff experiences of digital transformation. Purposive sampling selected academic staff, administrative staff, ICT personnel, and management members involved in digital platform implementation. Data were collected through semi-structured interviews, participant observation, and document analysis and analyzed thematically. Findings revealed inadequate ICT infrastructure, unreliable internet connectivity, limited technical support, digital skills gaps, and resistance to technological change as major barriers. Despite these challenges, digital transformation offered opportunities to improve teaching, learning, communication, data management, and institutional governance. The study recommends sustained digital literacy training for staff and increased investment in ICT infrastructure and technical support. Findings contribute to scholarship on digital transformation in higher education and inform policymakers, university administrators, and stakeholders seeking effective technology adoption.

Journal of Policy and Development Studies (JPDS)

Vol. 20 Issue 5 (2026)
ISSN(p) 1597-9385
ISSN (e) 2814-1091
Home page:
https://ajol.info/index.php/jpds

***ARTICLE INFO**:*
Keyword:
Digital Transformation, Higher Education, University Administration, Academic Work, Bolgatanga Technical University

Received: 15 May 2026
Revised: 17 June 2026
Accepted: 18 June 2026

DOI

https://dx.doi.org/10.4314/jpds.v20i5.6

1. Introduction

Globally, one needs not to be told that digital transformation has become one of the major tools in fostering and facilitating the improvement of service deliveries in higher educational institutions such as universities. According to some scholars, digital transformation is the integration of digital technologies into all forms of institutional operations, typically reflecting and reshaping how universities now deliver academic services, ranging from managing administration and engaging with internal and external stakeholders (Vial, 2019; Hashim et al, 2022: Zabalawi et al, 2024). Literature demonstrate that globally , universities are increasingly adopting and deploying digital platforms such as electronic records systems, learning management systems , virtual classrooms, cloud-based administration tools, and artificial intelligence-supported services to enhance efficiency, accessibility, and decision-making processes (Baljit Singh et al., 2023 ;Taribagil et al,2023; Zabalawi et al, 2024: Musayeva, 2025).Through this, traditional academic and administrative roles in higher educational institutions have now been redefined and transformed , making it mandatory and necessary for both administrative and academic staff including students to adapt to these technological environments.

In the context of developed countries, digital transformation has played a pivotal role at improving institutional efficiency and service delivery in higher educational institutions (Mohamed Hashim et al., 2022). Studies have shown that integrated digital ecosystems that support teaching, research, administration, and communication have been integrated into universities in Europe, North America, and parts of Asia (Nguyen & Tuamsuk, 2022: Morze et al, 2023; Anvari et al , 2024).

Notwithstanding this positive development, it is important to recognize that digital transformation is often confronted with some challenges, including human resistance , human capacity, institutional readiness, leadership commitment, and organizational culture (Bozkus, 2023; Cyfert et al., 2025; Trushkina et al., 2020). To confront these challenges, educational institutions that have the capacity, continue to invest in periodic training of their staff and infrastructure upgrading to sustain digital growth (Brunetti et al., 2020; Mian et al., 2020; Bates, 2001; Bond et al 2021).

However, the situation of digital transformation in higher educational institutions in developing countries is a bit different, especially in Africa. The fact is that digital transformation in higher educational institutions in developing countries is progressing at a slower and uneven pace (Zeleza & Okanda, 2021; Mualla, 2024). Literature suggest that several universities in Africa, encounter challenges such as infrastructural deficits, unreliable internet connectivity, limited funding, and inadequate ICT skills among staff(Siddiquah & Salim, 2017; Ntorukiri et al, 2022).

These challenges mostly militate against the effective implementation of digital systems, thereby hindering their impact on institutional performance (Boateng et al, 2023). Despite these constraints, African universities continue to adopt digital tools. A typical example of this, is reflected in response to global pressures during the COVID-19 pandemic, which created a paradigm shift toward online teaching and learning and digital administration (Mhlanga et al,2022; Ndibalema, 2022).

In Ghana, studies reveal that appreciable number of higher educational institutions have attempted in making efforts toward integrating digital technologies into academic and administrative work(Ampratwum, 2025; Mohammed et al, 2026). Classical examples include online admission systems, online publication of students results, electronic registration platforms, and virtual learning environments introduced by many universities in Ghana including BTU. However, despite this positive move, the institutions continue to face challenges such as poor digital literacy, inconsistent system usage and resistance to change (Rahman et al, 2024; Singun, 2025). These

concerns raise a debate about the sustainability and effectiveness of digital systems in improving higher educational institutional performance.

1.2 Problem Statement

In the case of BTU, digital transformation is gradually becoming part and parcel of both academic and administrative operations. Staff are increasingly encouraged to use digital tools for teaching, staff appraisals, communication, record keeping, and reporting. The challenge here is that not all staff are endowed with digital skills. Anecdotal evidence suggests that there are disparities in digital skills, uneven access to ICT resources, and varying levels of acceptance of digital systems among staff. Challenges such as inadequate infrastructure, insufficient training, poor system integration, and resistance to technological change continue to undermine effective implementation of digital transformation systems (Agyapong & Asare, 2022). Additionally, institutional support systems may not be enough to ensure smooth transition. This makes it very critical to examine how digital transformation is experienced by both academic and administrators' staff within the institution. It is very important to note that although there is the growing importance of digital transformation in higher educational institutions, there remain a gap of limited context-specific studies, focusing on how both academic and administrative staff in technical universities experience this transformation. Not much is known about the lived realities, challenges, and opportunities in the context of digital systems in universities in Northern Ghana. In other words, what remains unclear is how these challenges and opportunities are experienced and interpreted by both academic and administrative staff, and how they influence institutional performance. This study, therefore, seeks to address this gap by exploring the in depth realities of digital transformation within the institution within BTU.

1.3 Research Objectives

The main objective of the study is to explore the challenges and opportunities of digital transformation in university administration and academic work at BTU. Specifically, the study will examine the extent to which digital systems are used among BTU staff, explore the challenges encountered in the use of digital technologies, identify the opportunities created by digital transformation for institutional efficiency, and understand staff perceptions of digital transformation in their academic and administrative roles. The study further aim is to examine the institutional support systems available for facilitating digital transformation.

1.4 Research Questions

The study is anchored on the following research questions: What is the extent of digital transformation adoption among academic and administrative staff at BTU? What challenges do staff of BTU encounter in the use of digital systems? What opportunities does digital transformation present for improving academic and administrative efficiency? How do staff of BTU perceive digital transformation in their daily work activities? What institutional support systems exist to enhance digital transformation?

2. Review of Related Literature

2.1 Global Context

Globally, it has been recognized and acknowledged that digital transformation has become a major tool in reshaping institutional efficiency, governance, and knowledge delivery systems in high education. According Vial (2019), digital transformation is a holistic process that transcends beyond the adoption of digital tools. This author explains that digital transformation includes fundamental changes in organizational structures, institutional culture, and operational processes. The import of this author, implies that universities

should not only focus on adopting digital systems but also the need to redefine how academic and administrative work should be conceptualized and delivered in the context of digital systems. For instance, universities in advanced economies, have incorporated digital ecosystems into their core functions, enabling seamless integration between teaching, research, administration, and student services (Simchenko & Berkovich, 2021; Anvari et al., 2024; Omodan, 2024). According to these scholars, these digital ecosystems development are contributing significantly at improving administrative and academic service deliveries and ensuring transparency and accountability in high educations in advanced economy countries.

Bond et al. (2021) in their study, conclude that digital learning platforms and virtual systems are pivotal for enhancing student engagement, improving communication channels, and increasing administrative responsiveness in universities. Their study show that Learning Management Systems (LMS), virtual classrooms, and online administrative portals have become major tools for enhancing teaching and learning as well as administrative work in higher education institutions. These systems have reduced bureaucratic delays and improved access to academic resources. However, despite these benefits, the authors also highlight that digital transformation introduces new complexities, including digital fatigue, information overload, and challenges related to maintaining academic integrity in online environments (Gorrell, 2023; Mohamed Hashim et al., 2022; Dogan & Arslan, 2026).

Studies reveal that in developed countries such as North America and Europe universities have invested heavily in emerging technologies including artificial intelligence, machine learning systems, and advanced learning analytics to support decision-making and institutional planning. These investments have contributed to robust ICT infrastructure, stable funding systems, and continuous professional development programs of these universities, making them to equip staff with the needed digital competencies (Ansari & Gupta, 2025; Gupta et al., 2026). As a result of this strong institutional support, these universities have witnessed smoother transitions into digital environments. It must be emphasized that despite the technologically advanced of these universities, academic staff and administrators often experience and encounter workload as a result of the constant system updates and expectations for digital content creation (Waycott et al., 2010; Gregory & Lodge, 2015; Polly et al., 2021).

Administrative staff in global universities also face unique challenges despite technological advancement (Burbules & Callister Jr., 2000; Mushemeza, 2016; Adam et al., 2017). Research indicates that complex integrated systems often require continuous adaptation, which can create operational pressure and reduce efficiency if adequate training is not provided (Brunetti et al., 2020; Lakemond et al., 2021). Additionally, frequent software updates and system integration changes demand ongoing technical support, which can strain institutional resources (Northrop et al., 2006). These findings demonstrate that digital transformation is not a linear process of improvement but rather a continuous cycle of adaptation and adjustment.

The above global reviewed literature suggest that while digital transformation has play a significant role at improving efficiency and institutional performance in higher educational institutions such BTU, it also confronted with challenges such as human capacity, workload distribution, and technological complexity. This dual reality emphasizes the need for continuous capacity building and institutional support systems to sustain digital progress across universities.

2.2 African Context

In the Africa context, empirical studies demonstrate when it comes to digital transformation in higher education, it is confronted by uneven development and wider infrastructural disparities. According to Osei and Boateng (2022), although some universities in Africa, particularly in South Africa, Kenya, and Rwanda, have made progress in implementing e-learning systems and digital administrative platforms, many higher educational institutions across Sub-Saharan Africa continue to face serious limitations. These two scholars identify these challenges as inadequate ICT infrastructure, unstable internet connectivity, and insufficient funding. Due to this, digital transformation remains partial and inconsistent across the continent. A typical example of one the challenges that exposes the weaknesses in Africa's higher education to digital systems was during the outbreak of the COVID-19 pandemic (Muftahu, 2020; Mhlanga et al., 2022; Ndibalema, 2022). Even though some of the universities adopted digital systems such as the online teaching and learning and remote administrative processes, many universities could sustain these systems as a result of lack of unprepared (Bacow et al., 2012; Ali, 2020; Mohamed Hashim et al., 2022). Studies suggests that institutions were forced to adopt emergency remote teaching without proper training or infrastructure, leading to uneven learning outcomes and administrative inefficiencies (Bacow et al., 2012; Ali, 2020; Oliveira et al., 2021; Mohamed Hashim et al., 2022). This indicates that digital transformation in Africa is often reactive rather than strategically planned.

In furtherance, studies reveal that human factors contribute in shaping digital transformation outcomes in African universities (Zeleza & Okanda, 2021; Ajani, 2024; Albouti & Balaji, 2025). According to these authors, low digital literacy among academic and administrative staff have the greater tendency of affecting the successful implementation of ICT systems. Their findings show that even in the midst of the availability of digital platforms, many staff members lack the confidence and skills required to use them effectively.

Resistance to change has been identified as another major barrier to digital transformation in African higher educational institutions. Often, staff members perceive digital systems as very complex or burdensome to adopt (Gkrimpizi et al., 2023; Tariq & Mehmood, 2024; Singun, 2025; Mabotha & Ngcamu, 2025). The issue becomes very worse when there is lack institutional support for adequate training of staff. Organizational culture also plays a role, as hierarchical structures and limited innovation support can slow down digital adoption (Büschgens et al., 2013; Goncalves et al., 2020). All these demonstrate that digital transformation in Africa cannot solely be attributed to a technological issue but also deeply entrenched in organizational dynamics.

From the above reviewed literature in the context of the African environs, it may be concluded that despite growing recognition of the importance of digital transformation, many universities continue to face challenges when it comes implementation. This may be attributed to infrastructural, financial, and human capacity constraints. This creates a gap between policy intentions and actual practice, highlighting the need for context-specific strategies to support sustainable digital transformation in African higher education.

2.3 Ghanaian Context

In Ghana, empirical studies on digital transformation in higher education reveal a mixed picture of progress and persistent challenges (Loglo, 2024; Ajani, 2024; Ampratwum, 2025; Aposika, 2026). Agyapong and Asare (2022) found that public universities in Ghana have made significant strides in adopting ICT systems, including online admission platforms,

digital communication tools, and e-learning environments (Yeboah, 2013; Agormedah et al., 2020; Ampratwum, 2025; Amaniampong, 2025). There is no doubt that these positive developments have is contributing to improving access to educational services and reducing some administrative challenges. However, the effectiveness of these systems is constrained by lack of ICT infrastructural and human capacity. Thus, many Ghanaian universities continue to face implementation challenges. Empirical studies from Ghana demonstrats that inadequate ICT infrastructure, unreliable internet connectivity, and insufficient technical support hinder the full realization of digital transformation goals (Ofosu-Ampong, 2021; Acquah, 2024). In many higher educational institutions in Ghana, digital systems are introduced without corresponding investments in training and maintenance, leading to inconsistent usage and system inefficiencies. Based on this staff often depend on manual processes alongside digital systems, creating hybrid administrative structures that reduce efficiency (Ayakwah et al., 2021; Frimpong et al., 2023).

Aside the above, human capacity issues have also been recognized as major concern in Ghanaian higher education institutions. Many academic and administrative staff in Ghanaian higher education institutions do not have the needed digital skills required for effective use of modern ICT systems. Scholars Ghanaian Scholars have also attributed the low digital literacy levels among staff to the lack of continuous professional development programs (Quaicoe & Pata, 2020; Hanson & Beem, 2022; Dzidzornu & Xu, 2025; Amemasor et al., 2025). According to these authors, this affects their ability to fully utilize digital platforms for teaching, learning, and administrative work. Consequently, the intended benefits of digital transformation are not fully realized.

Furthermore, just like other African countries where there is resistance to digital change, leading to implementation challenges, so it is with some staff in Ghanaian universities (Loglo, 2024). Even in this modernization era, some staff members prefer traditional administrative methods due to familiarity and perceived reliability. This resistance, mostly, is reinforced by lack of inadequate training and limited institutional support. Additionally, inconsistencies in system performance discourage full adoption of digital tools, further limiting their effectiveness in improving institutional efficiency (Singun, 2025).

Specifically, within technical universities such as BTU, empirical research remains limited. Existing studies tend to focus broadly on ICT adoption in Ghanaian universities without examining the specific lived experiences of both academic and administrative staff. Moreover, there is limited research focusing on Northern Ghana, where digital infrastructure challenges are more pronounced. This creates a clear contextual and empirical gap, which this study seeks to address by exploring the challenges and opportunities of digital transformation within the institution in depth.

2.4 Theoretical Framework

The foundation of this study is rooted on the Technology Acceptance Model (TAM). Developed by Davis et al., (1989), the TAM is one of the most influential theoretical frameworks that resonates well with user acceptance and adoption of technology (Davis et al., 1989). According to the model, the decision of the individuals to adopt and use a technological system are manly determined by two core beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The extent to which a user believes that a particular technology will enhance their job performance, efficiency, or productivity is what is referred to as PU , while PEOU is also refers to the degree to which a user believes that using the

technology will be free of effort. Together, these constructs shape users' attitudes toward technology, which eventually influence their behavioural intention and actual usage.

TAM align very well in the context of this study. It serves as strong foundation for explaining how academic and administrative staff at BTU adopt and engage with digital transformation tools such as Learning Management Systems, electronic records management systems, online communication platforms, and institutional databases. Staff members who view digital systems as relevant , particularly improving and enhancing teaching and learning , simplifying administrative procedures, enhancing communication, and reducing paperwork are obvious likely to integrate them into their daily work activities. On the other hand , staff who feels digital platforms are user-friendly, requiring minimal technical difficulty are more likely to adapt positive attitudes toward using digital flatforms to enhance their work.

However, it is very significant to state the application of TAM to this study transcends beyond its original individual-level focus to a broader institutional context within which technology adoption occurs. In a university setting such as BTU, technology acceptance is not determined solely by individual perceptions but is also shaped by organizational realities, including infrastructure availability, institutional policies, leadership support, and access to training. For instance, even when staff perceive digital systems as useful, unreliable internet connectivity, inadequate ICT equipment, or lack of technical support may become a challenge to the user. This implies that external environmental also play significant role in shaping both PU, while PEOU and PEOU.

Furthermore, within the study context, institutional support mechanisms such as continuous professional development, ICT training programmes, and responsive technical assistance systems are crucial in strengthening staff confidence and competence in using digital tools. Without these enabling conditions, even highly motivated staff may struggle to effectively engage with digital platforms. This demonstrates that technology acceptance in higher education institutions is not only a psychological process but also an organizational one that depends on the availability of supportive structures and resources.

In addition, the model is particularly useful in understanding the variation in digital transformation experiences between academic and administrative staff. Academic staff may perceive greater usefulness in digital tools due to their direct application in teaching, assessment, and research activities, while administrative staff may experience more challenges due to system complexity and workflow disruptions. These differences highlight how occupational roles influence technology perceptions and adoption behaviour within the same institutional environment.

In conclusion, while the Technology Acceptance Model provides a strong foundation for explaining technology adoption behaviour, this study situates it within a broader contextual framework that incorporates institutional, infrastructural, and environmental factors. This expanded application allows for a more comprehensive understanding of digital transformation at BTU, capturing not only individual perceptions but also the systemic conditions that enable or constrain effective technology adoption in higher education.

3. Methodology

3.1 Research Approach and Paradigm

The study adopted a qualitative research approach. The reason being that it is best suited for exploring in-depth experiences, perceptions, and meanings attached to digital transformation among staff in higher education institutions. According to Mantula et al.,

(2024), qualitative research enables the researcher to understand complex social and organizational phenomena within their natural settings rather than measuring them numerically. The study was guided by the interpretivist research paradigm, which assumes that reality is socially constructed and best understood through the subjective experiences of individuals. This paradigm fits into examining how academic and administrative staff at BTU interpret and experience digital transformation in their daily work.

3.2 Research Design

The study employed a case study design. A case study design allows for an in-depth and contextual analysis of a bounded system such as an institution. According to Yin et al., (2018), case study research is appropriate when the researcher seeks to investigate contemporary phenomena within real-life contexts. This design is suitable for this study because it enables a detailed exploration of digital transformation challenges and opportunities within the university, capturing real institutional experiences that may not be fully understood through quantitative approaches.

2.3 Study Area

The study was conducted at BTU, located in the Upper East Region of Ghana. The university is a public technical institution mandated to provide Technical and Vocational Education and Training (TVET) to support national development. Just like many higher education institutions in Ghana, BTU is undergoing gradual digital transformation in both academic and administrative processes. It is therefore makes it a suitable case to examine how digital technologies are integrated into institutional operations and how staff experience these changes.

2.4 Target Population

On the target population for the study, the researchers focused on academic staff, administrative staff, ICT personnel, and selected management staff of the university. These groups are directly involved in the implementation and use of digital systems within the institution. Academic staff use digital platforms for teaching, learning, appraisals and research activities, while administrative staff deploy digital systems for record keeping, communication, and institutional coordination. ICT personnel and management staff play key roles in system support, policy development, and strategic implementation of digital transformation initiatives.

2.5 Sampling Technique and Sample Size

The study employed purposive sampling technique to select participants. Purposive sampling is appropriate in qualitative research because it allows the researcher to deliberately select individuals who have relevant knowledge and experience of the phenomenon under investigation (Palinkas et al., 2015). Participants were selected based on their involvement with digital systems in academic and administrative work.

The sample size ranged between 15 and 30 participants and depended on data saturation. Data saturation refers to the point at which no new information or themes emerge from additional interviews (Guest et al., 2020). This range is considered appropriate for qualitative case study research, which focuses on depth of information rather than statistical generalization.

2.6 Data Collection Methods

Data were collected, using semi-structured interviews and participant observation and document analysis. Semi-structured interviews were based on the primary data collection

method. The researcher used this strategy because they allowed participants to express their experiences freely while ensuring that key research areas were covered. This method is widely used in qualitative research due to its flexibility and depth (Kallio et al., 2016). Interview guides will focus on experiences, challenges, opportunities, and institutional support related to digital transformation.

In addition, document analysis was conducted on institutional materials such as ICT policies, strategic plans, administrative reports, and digital transformation frameworks. This helped triangulate interview data and provided a deeper understanding of institutional practices and policies guiding digital transformation.

2.7 Data Analysis

Data collected from interviews and documents were analyzed using thematic analysis. Thematic analysis is a qualitative analytical method used to identify, analyze, and interpret patterns of meaning within data (Braun & Clarke, 2023). The analysis involved six stages: familiarization with data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. This approach helped the researchers to systematically identify key patterns related to challenges and opportunities of digital transformation at the university.

2.8 Validity and Trustworthiness

To ensure the trustworthiness of the study, several strategies were adopted. Credibility was ensured through triangulation of data sources, including interviews and document analysis. Member checking was used by allowing participants to review summaries of their responses to ensure accuracy. Transferability was achieved through thick description of the research context and participants' experiences, enabling readers to determine the applicability of findings to other settings. Dependability was also ensured through a clear documentation of the research process, while confirmability was achieved by maintaining neutrality and reducing researcher bias through reflexive practices (Pandey & Patnaik, 2014).

2.9 Ethical Considerations

Ethical issues were strictly observed throughout the research process. Ethical approval was obtained from relevant institutional authorities before data collection begins. Participants were fully informed about the purpose of the study, and informed consent was obtained from all respondents. Participation was voluntary, and respondents were told they have the right to withdraw from the study at any time without any negative consequences. Confidentiality and anonymity was guaranteed by ensuring that no personal identifiers were included in the reporting of findings. All data collected were securely stored and used strictly for academic purposes in accordance with established research ethics guidelines (Hay & Israel, 2009).

4. Findings and Discussion

4.1 Findings

The goal of this study was to explore the challenges and opportunities of digital transformation in university administration and academic work, focusing on BTU. The study was guided by five research questions. It examined the extent of digital technology adoption among academic and administrative staff, the challenges associated with the use of digital systems, the opportunities of digital transformation, staff perceptions of digital technologies in their daily work, and the institutional support mechanisms available to facilitate digital transformation. Analysis of the data gathered, generated a number of interconnected themes, providing insights into the university's digital transformation landscape. The

inquiry was grounded on the understanding that digital technologies have become indispensable tools for enhancing efficiency, effectiveness, and innovation in higher education institutions. The various themes that emerged from the findings are highlighted below;

4.2 Extent of Digital Adoption by Academic and Administrative Staff

In relation to digital transformation adoption, the study revealed that the adoption rate is uneven across the institution. For instance, while academic staff relatively use digital tools such as digital lecture delivery tools, online assessment platforms, email communication systems, Learning Management Systems, administrative staff reported partial and inconsistent use of digital systems, often combining manual processes with electronic systems. For example, one of the academic staff emphasized,

"I regularly use the LMS to upload lecture notes and communicate with students" (Participant 1, semi-structured interview, June 1, 2026).

Contrarily, one of the administrative officers stated:

"We are yet to get fully used to the digital platforms introduced by the university and so most of us have to resort to manual files particularly when the system is not accessible" (Participant 2, semi-structured interview, June 1, 2026).).

4.3 Challenges in Digital Technology Use

With regards to challenges faced by both academic and administrative in relation to the use of digital systems, participants identified many barriers including poor internet connectivity, system downtime, inadequate ICT infrastructure, limited training opportunities, and low digital literacy among some staff. A typical example was started by one of the ICT officers:

"Poor network mostly delays or even interrupt or even stop our work completely" (Participant 5, semi-structured interview, June 2, 2026).). Another administrative staff also remarked, "*the most boring and stressful thing is when I sometime find it difficult to use some of the digital platforms developed for us to enhance our work. I get so bored and worried when there is no immediate support at such difficult moments*" (Participant 6, semi-structured interview, June 3, 2026).

4.4 Opportunities of Digital Transformation

On this subject matter, participants shared the view that digital systems contribute significantly at improving efficiency, effective and rapid communication, and accessibility of institutional services within its internal and external publics. One of the academic staff stressed:

"To most of us as lecturers, there are many opportunities we tap from the digital platforms. For instance, the make it easier for us to upload our students results after marking our scripts. Apart from this, we are able to share our lecture notes electronically with our students" (Participant 6, semi-structured interview, June 5, 2026).

In the vein, an administrative staff remarked:

"Unlike before where we used paper memos thereby delaying communication it not so now. Communication is now rapid and faster than before due to our usage of emails and online platforms" (Participant 7, semi-structured interview, June 8, 2026).

4.5 Staff Perceptions of Digital Systems

On the issue of staff perceptions of digital transformation, finding revealed mixed feelings. While some participants perceived digital transformation as beneficial, efficient, and time-saving, others viewed it as very complex and occasionally frustrating as a result of system inefficiencies. For example, one of the lecturers stated*;*

*"With the introduction of digital platforms, teaching and learning have now become more flexible and effective than before" (*Participant 8, semi-structured interview, June 3, 2026).).
In contrast, another lecturer noted:
"*Sometimes some us become very frustrated because at some times the digital platforms delay our work due to either poor network connectivity or light off*" (Participant 9, semi-structured interview, June 9, 2026).

4.6 Institutional Support Mechanism and Limitations

Finally, in the context of institutional support systems, the study demonstrated that although there are institutional support mechanisms such as training and ICT assistance, they are not regular and also limited. Participants observed that although there are training but they are lacked of continuous and technical support. As remarked by one of the participants:
one of our major challenges is that we are not trained on how to use the digital platforms regularly but only periodically. Again, we do not always get support when we encounter challenges in the application of the digital platforms in discharging our duties" (Participant 10, semi-structured interview, June 10, 2026).
The interview results were corroborated by the participant observation. The participation observations demonstrated appreciable usage of digital technologies by academic staff than the administrative staff. It also revealed persistent bottlenecks such as unstable internet connectivity, hybrid manual-digital processes, and the different levels of staff digital skills. This illustrates that there is still more room for building the capacity of both academic and administrative of BTU in the area of digital transformation.

4.7 Discussions

The findings of this study demonstrate that BTU is characterized by uneven adoption, infrastructural limitations, mixed user perceptions, and insufficient institutional support when it comes to digital transformation. There is uneven adoption of digital systems between academic and administrative staff. These findings resonate with global, African, and Ghanaian empirical literature. The findings also fit into the TAM, which argues that perceived usefulness and perceived ease of use largely influence technology adoption (Davis, 1989). These findings are consistent with Bond et al. (2021), who concluded in their study that academic staff are more interested to adopt digital technologies because they support in teaching, learning, and student engagement. Similarly, Simchenko and Berkovich (2021) and Anvari et al. (2024) argue that academic departments of higher education are often the early adopters of technological innovations and attributed that to instructional needs. While academic staff at BTU appear to recognize the relevance of digital systems in enhancing teaching and learning and communication, administrative staff experience slower adoption due to the complexity of integrating digital technologies into existing administrative procedures. This finding corroborates Brunetti et al. (2020) and Lakemond et al. (2021), who in their study, found that administrative digital systems often require continuous adaptation and specialized competencies, thereby slowing implementation. Within the TAM framework, these differences suggest variations in perceived usefulness across staff categories.
The infrastructural challenges including inadequate ICT facilities, unstable internet connectivity, and system unreliability identified in this study, strongly support findings from African and Ghanaian scholars. Osei and Boateng (2022) found that many African universities struggle with insufficient ICT infrastructure and funding constraints, which limit effective digital transformation. Similar findings were reported by Muftahu (2020), Mhlanga

et al. (2022), and Ndibalema (2022), who observed that the COVID-19 pandemic exposed the technological weaknesses of many African higher education institutions. In the Ghanaian context, Ofosu-Ampong (2021) and Acquah (2024) also observed that unreliable internet services and inadequate technical support continue to limit the effective implementation of digital systems in universities. These infrastructural limitations directly affect the perceived ease of use of technology, thereby reducing adoption and sustained usage among staff.

Per the findings, limited ICT skills and inadequate training constrain the effective utilization of digital systems. This finding align with Zeleza and Okanda (2021), Ajani (2024), and Albouti and Balaji (2025). These scholars also identified low digital literacy as a major obstacle to digital transformation in African universities. In the Ghanaian context, Quaicoe and Pata (2020), Hanson and Beem (2022), and Dzidzornu and Xu (2025) similarly reported that inadequate professional development opportunities limit staff capacity to effectively utilize digital technologies. The findings, therefore, emphasized that successful digital transformation do not only require technological investment but also consistent human capacity development. From the context of TAM, inadequate skills reduce users' perceived ease of use, which negatively affects technology acceptance and utilization.

The findings which demonstrated that digital transformation enhances efficiency, communication, and access to information strongly corroborate by existing literature. For instance, Vial (2019) argues that digital transformation improves organizational performance through process optimization and improved decision-making. In same way, Bond et al. (2021) found that digital learning platforms and administrative systems significantly improve communication channels, responsiveness, and access to academic resources. Participants in this study acknowledged that digital systems facilitate faster communication, reduce paperwork, and improve operational efficiency. These benefits reinforced by the TAM construct of perceived usefulness, suggesting that staff are more likely to embrace digital systems when they experience tangible improvements in their work performance.

On the other hand , the study also revealed mixed perceptions in relation to digital transformation. Some participants perceived digital technologies as beneficial and empowering, while others viewed them as burdensome due to system instability, increased workload, and operational inefficiencies. This finding resonates with Gorrell (2023), Mohamed Hashim et al. (2022), and Dogan and Arslan (2026), who observed that digital transformation mostly introduces challenges such as information overload, digital fatigue, and increased technological demands. Similarly, Waycott et al. (2010), Gregory and Lodge (2015), and Polly et al. (2021) found that academic staff frequently experience increased workloads associated with digital content creation and continuous system updates. These findings suggest that negative perceptions are not necessarily indicators of resistance to technology but may instead reflect frustrations arising from inadequate facilitating conditions and support structures.

The limited institutional support expressed by participants is also consistent with previous empirical studies. Agyapong and Asare (2022) in their study observed that inadequate training opportunities and weak technical support systems of reduce the effectiveness of ICT adoption in Ghanaian universities. In a similar van, Northrop et al. (2006) argue that ongoing technical support is very crucial for sustaining complex digital systems. The findings suggest that the absence of regular training, maintenance, and user support negatively could affect staff confidence and willingness to engage with digital platforms. In the context of TAM,

institutional support functions as critical external variable influencing both perceived usefulness and perceived ease of use.

Furthermore, the persistence of hybrid systems, where digital processes coexist with manual procedures, resonate with previous findings in Ghana and Africa. Ayakwah et al. (2021) and Frimpong et al. (2023) observed that many Ghanaian universities continue to operate hybrid administrative systems because digital platforms are often introduced without corresponding investments in infrastructure, training, and maintenance. Similarly, Osei and Boateng (2022) note that digital transformation across many African universities remains partial and uneven rather than fully institutionalized. The continued reliance on manual processes at BTU therefore indicates that the institution remains in a transitional stage of digital transformation rather than having achieved full digital maturity.

To sum it up, the findings demonstrate that digital transformation at BTU presents significant opportunities for improving institutional efficiency, communication, and service delivery. However, these opportunities are constrained by infrastructural deficiencies, limited digital competencies, mixed staff perceptions, and insufficient institutional support. The findings reinforce both global and African evidence that digital transformation is not merely a technological undertaking but also an organizational and human-capacity challenge. Consequently, achieving sustainable digital transformation at BTU will require strategic investments in ICT infrastructure, continuous staff training, reliable technical support systems, and stronger institutional commitment to digital innovation.

5. Conclusion and Recommendations

5.1 Conclusion

The focus of the study was to explore the challenges and opportunities of digital transformation in university administration and academic work at BTU. Findings reveal that although digital transformation within the institution is ongoing, it remains uneven, fragmented, and transitional in nature. While academic staff embrace digital tools for online teaching and learning , learning management systems and digital communication tools , administrative staff mostly continue to rely on a hybrid system that combines both manual and electronic processes. This uneven adoption reflects broader structural and human capacity disparities within the institution.

The study concludes that despite the benefits of digital transformation such as improved communication, faster administrative processes, and enhanced academic delivery, several persistent challenges continue to impede the full implementation digital systems in the university. Among these bottlenecks include inadequate ICT infrastructure, unreliable internet connectivity, insufficient training opportunities, low digital literacy among some staff, and limited technical support. These challenges affect the efficiency and reliability of digital systems.

Additionally, the study concludes that the perceptions of staff on digital transformation are mixed and shaped by their experiences with system reliability and institutional support. Many staff recognize the importance of digital tools in improving productivity and reducing administrative burdens. Others perceive them as complex and sometimes frustrating due to frequent interruptions system and lack of inadequate support. This demonstrates that the acceptance of digital transformation does not only dependent on availability of technology but also on usability and enabling conditions within the institution.

The study, theoretically, asserts the significance of the TAM, particularly when it comes to the roles of perceived usefulness and perceived ease of use in shaping technology adoption., the Findings, however, reveal institutional support, infrastructure, and training which are external factors also play a major roles in influence these perceptions. To sum it up, digital transformation at the university can best be described as an evolving process shaped by both technological and organizational dynamics rather than a fully institutionalized system.

5.2 Recommendations

Based on the outcome of this study's findings, it is recommended that management of BTU prioritize the strengthening of ICT infrastructure to help maintain reliable internet connectivity. It also important to ensure that the digital platforms are stabled and provide adequate technological resources in all the departments. A strong and stable digital infrastructure is the best solution for the sustaining the continuous use of digital systems. This would reduce disruptions to both academic and administrative activities.

In furtherance, the study underscores the need for institutionalization of continuous professional development programmes on digital literacy for both academic and administrative staff. These training programmes should be ongoing, stressing on practical skills such as the use of learning management systems, digital records management, cybersecurity awareness, and emerging educational technologies. This in doubt will enhance staff confidence and overall system usability.

Beside the above , the study recommend that management of BTU establishes a dedicated and responsive ICT support unit that that provides real-time technical assistance to staff. Such a unit must be made to operate with clear service delivery standards to help address system challenges promptly when they arise. This will help reduce downtime, improve system reliability, and increase staff trust in digital platforms.

Furthermore, there is the need for management to help promote a very strong institutional digital culture by constantly and consistently encouraging all staff across all the departments of the university to deploy digital tools in the discharge of their duties. Leadership There is the need for leadership to lead by example in embracing digital tools and enforcing policies to reduce over-reliance on manual processes and reduce resistance to digital transformation, particularly among staff who are less technologically inclined.

Finally, adequate budgetary allocations should be made for the maintenance, upgrading, and expansion of digital infrastructure. Sustained investment in digital technologies will enable the university to remain competitive, enhance productivity, and successfully achieve its long-term strategic objectives in an increasingly digital higher education environment

To conclude, the study recommends in going forward, future digital transformation strategies should adopt a holistic approach that will integrate technology, human capacity development, and organizational support systems into its implementation process . This will ensure promote comprehensive institutional change process that enhances efficiency, innovation, and service delivery across the university system.

.

References

Acquah, A. (2024). Digital inclusivity: Exploring e-government use among businesses in Ghana. *Transforming Government: People, Process and Policy, 18*(4), 856–873.

Adam, I. O., Effah, J., & Boateng, R. (2017). Virtualization of an administrative work environment in higher education: Managing information in a developing country university. *Journal of Enterprise Information Management, 30*(5), 723–747.

Agormedah, E. K., Henaku, E. A., Ayite, D. M. K., & Ansah, E. A. (2020). Online learning in higher education during COVID-19 pandemic: A case of Ghana. *Journal of Educational Technology and Online Learning, 3*(3), 183–210.

Ajani, O. A. (2024). Exploring digital transformation and future trends in higher education development across African nations. *Journal of Pedagogical Sociology and Psychology, 6*(3), 34–48.

Albouti, A., & Balaji, K. D. (2025). From technology adoption to digital transformation: How institutional trust and digital readiness shape HRIS success in higher education. *Journal of Logistics, Informatics and Service Science, 12*(10), 110–124.

Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher Education Studies, 10*(3), 16–25.

Amaniampong, A. (2025). *Design and implementation of M-learning framework for virtual ICT education in colleges of education in Ghana*.

Amemasor, S. K., Oppong, S. O., Ghansah, B., Benuwa, B. B., & Agbeko, M. (2025). The influence of digital professional development and professional learning communities in the relationship between school digital preparedness and digital instructional integration. *PLoS ONE, 20*(7), e0328883.

Ampratwum, F. O. (2025). *Educational approaches using emerging computing technologies in Ghana: A qualitative exploratory study* (Doctoral dissertation, Colorado Technical University).

Ansari, G. G., & Gupta, R. S. (2025). Does ICT investment necessarily improve operational performance? An empirical analysis of health services firms in India. *BMC Health Services Research, 25*(1), 841.

Anvari, R., Moradi, F., & Shirvani, A. (2024). Digital learning ecosystem at educational institutions: A 4-university perspective. *Professional Studies: Theory and Practice, 28*(1), 100–110.

Aposika, F. (2026). Digital transformation in higher education in Ghana with focus on ICT access utilization and policy challenges. *Discover Education*.

Ayakwah, A., Damoah, I. S., & Osabutey, E. L. (2021). Digitalization in Africa: The case of public programs in Ghana. In *Business in Africa in the Era of Digital Technology: Essays in Honour of Professor William Darley* (pp. 7–25). Springer International Publishing.

Bacow, L. S., Bowen, W. G., Guthrie, K. M., Long, M. P., & Lack, K. A. (2012). *Barriers to adoption of online learning systems in U.S. higher education* (pp. 39–51). Ithaka.

Bates, T. (2001). The continuing evolution of ICT capacity: The implications for education. In *The Changing Faces of Virtual Education* (pp. 29–46).

Boateng, J. K., Osei-Tutu, E. M., & Kwapong, O. A. T. (2023). The evolving development education in Ghana. In *Pedagogy of Hope for Global Social Justice* (p. 175).

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2021). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education, 18*(1), 50.

Bozkus, K. (2023). Organizational culture change and technology: Navigating the digital transformation. In *Organizational Culture: Cultural Change and Technology*. IntechOpen.

Braun, V., & Clarke, V. (2023). Toward good practice in thematic analysis: Avoiding common problems and becoming a knowing researcher. *International Journal of Transgender Health, 24*(1), 1–6.

Brunetti, F., Matt, D. T., Bonfanti, A., De Longhi, A., Pedrini, G., & Orzes, G. (2020). Digital transformation challenges: Strategies emerging from a multi-stakeholder approach. *The TQM Journal, 32*(4), 697–724.

Burbules, N. C., & Callister, T. A., Jr. (2000). Universities in transition: The promise and the challenge of new technologies. *Teachers College Record, 102*(2), 271–293.

Büschgens, T., Bausch, A., & Balkin, D. B. (2013). Organizational culture and innovation: A meta-analytic review. *Journal of Product Innovation Management, 30*(4), 763–781.

Cyfert, S., Dyduch, W., Szumowski, W., & Prause, G. (2025). Are we ready for digital transformation? The role of organizational culture, leadership and competence in building digital advantage. *Central European Management Journal, 33*(2), 219–231.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). Technology acceptance model. *Management Science, 35*(8), 982–1003.

Dogan, M., & Arslan, H. (2026). Empowering academics in the digital age: Navigating the transformation of higher education. *European Journal of Education, 61*(1), e70420.

Dzidzornu, A. A. K., & Xu, X. (2025). Assessing digital literacy competency among student teachers in Ghana: Perceptions, challenges, and pathways for improvement using the UNESCO ICT-CFT. *Discover Education, 4*(1), 1–23.

Frimpong, L. K., Mensah, S. L., Okyere, S. A., Abunyewah, M., Diko, S. K., Enning, S. B., & Attigah, J. M. (2023). Digitalisation for whom: The determinants of residents' use of the digital property address system in Accra, Ghana. *Smart and Sustainable Built Environment, 12*(5), 1135–1152.

Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of barriers to digital transformation in higher education institutions: Systematic literature review. *Education Sciences, 13*(7), 746.

Goncalves, D., Bergquist, M., Bunk, R., & Alänge, S. (2020). Cultural aspects of organizational agility affecting digital innovation. *Journal of Entrepreneurship, Management and Innovation, 16*(4), 13–46.

Gorrell, A. (2023). The impact of digital transformation on academic work. *Studies in Technology Enhanced Learning, 3*(2).

Gregory, M. S. J., & Lodge, J. M. (2015). Academic workload: The silent barrier to the implementation of technology-enhanced learning strategies in higher education. *Distance Education, 36*(2), 210–230.

Guest, G., Namey, E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PLoS ONE, 15*(5), e0232076.

Gupta, D., Loomba, P., Niyati, N., Chahal, B. P. S., Kumar, V., & Waldia, P. D. (2026). Future financial decision-making systems: A new era of smart finance. In *Intersecting AI, Neurofinance, and Behavioral Finance for Decision Making* (pp. 323–356). IGI Global Scientific Publishing.

Hay, I., & Israel, M. (2009). Private people, secret places: Ethical research in practice. In M. Solem, K. Foote, & J. Monk (Eds.), *Aspiring Academics: A Resource Book for Graduate Students and Early Career Faculty* (pp. 167–178). Pearson Merrill Prentice Hall.

Hanson, M. A., & Beem, H. R. (2022). Role of digital literacy and tools in teacher persistence in an online hands-on science training in Ghana. In *2022 IEEE IFEES World Engineering Education Forum–Global Engineering Deans Council (WEEF-GEDC)* (pp. 1–5). IEEE.

Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing, 72*(12), 2954–2965.

Lakemond, N., Holmberg, G., & Pettersson, A. (2021). Digital transformation in complex systems. *IEEE Transactions on Engineering Management, 71*, 192–204.

Loglo, F. S. (2024). Towards digital transformation of selected Ghanaian public universities: Leadership enablers, challenges, and opportunities. *Open Praxis, 16*(3), 374–395.

Mantula, F., Mpofu, A. C., Mpofu, F. Y., & Shava, G. N. (2024). Qualitative research approach in higher education: Application, challenges and opportunities. *East African Journal of Education and Social Sciences, 5*(1), 1–10.

Mabotha, P. A. P., & Ngcamu, B. S. (2025). Digital transformation in the higher education sector: A systematic literature review. *Administrative Sciences, 16*(1), 1.

Mhlanga, D., Denhere, V., & Moloi, T. (2022). COVID-19 and the key digital transformation lessons for higher education institutions in South Africa. *Education Sciences, 12*(7), 464.

Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. D. (2022). A sustainable university: Digital transformation and beyond. *Education and Information Technologies, 27*(7), 8961–8996.

Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. D. (2022). Higher education strategy in digital transformation. *Education and Information Technologies, 27*(3), 3171–3195.

Mohammed, A. S., Amoah, C., & Abdulai, I. B. (2026). Technology integration on infrastructure to support educational needs in a college in Ghana. *Infrastructure Asset Management, 13*(1), 50–66.

Morze, N., Smyrnova-Trybulska, E., Drlík, M., & Buinytska, O. (2023). Development of advanced digital ecosystems at universities: A study comparing experiences from Ukraine, Poland and Slovakia. *European Journal of Education, 58*(4), 647–664.

Mualla, W., & Mualla, K. J. (2024). Digital transformation in higher education: Challenges and opportunities for developing countries. In *Higher Education in the Arab World: Digital Transformation* (pp. 211–231).

Muftahu, M. (2020). Higher education and COVID-19 pandemic: Matters arising and the challenges of sustaining academic programs in developing African universities. *International Journal of Educational Research Review, 5*(4), 417–423.

Musayeva, G. (2025). Trends in education of the Fourth Industrial Revolution in Azerbaijan. *Journal of Economics and Management Advances, 1*(2), 63–78.

Mushemeza, E. D. (2016). Opportunities and challenges of academic staff in higher education in Africa. *International Journal of Higher Education, 5*(3), 236–246.

Ndibalema, P. (2022). Constraints of transition to online distance learning in higher education institutions during COVID-19 in developing countries: A systematic review. *E-Learning and Digital Media, 19*(6), 595–618.

Nguyen, L. T., & Tuamsuk, K. (2022). Digital learning ecosystem at educational institutions: A content analysis of scholarly discourse. *Cogent Education, 9*(1), 2111033.

Ntorukiri, T. B., Kirugua, J. M., & Kirimi, F. (2022). Policy and infrastructure challenges influencing ICT implementation in universities: A literature review. *Discover Education, 1*(1), 19.

Ofosu-Ampong, K. (2021). Determinants, barriers and strategies of digital transformation adoption in a developing country COVID-19 era. *Journal of Digital Science, 3*(2), 67–83.

Oliveira, G., Grenha Teixeira, J., Torres, A., & Morais, C. (2021). An exploratory study on the emergency remote education experience of higher education students and teachers during the COVID-19 pandemic. *British Journal of Educational Technology, 52*(4), 1357–1376.

Omodan, B. I. (2024). Redefining university infrastructure for the 21st century: An interplay between physical assets and digital evolution. *Journal of Infrastructure, Policy and Development, 8*(4), 3468.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research, 42*(5), 533–544.

Pandey, S. C., & Patnaik, S. (2014). Establishing reliability and validity in qualitative inquiry: A critical examination. *Jharkhand Journal of Development and Management Studies, 12*(1), 5743–5753.

Polly, D., Martin, F., & Guilbaud, T. C. (2021). Examining barriers and desired supports to increase faculty members' use of digital technologies: Perspectives of faculty, staff and administrators. *Journal of Computing in Higher Education, 33*(1), 135–156.

Quaicoe, J. S., & Pata, K. (2020). Teachers' digital literacy and digital activity as digital divide components among basic schools in Ghana. *Education and Information Technologies, 25*(5), 4077–4095.

Rahman, M. H., Mohammed Ghazali, A. B., & Bin Mohamed Sawal, M. Z. H. (2024). Reasons for resistance to technology adoption in university libraries in Bangladesh. *Information Development.*

Shezad, F., Goswami, R., Shaheen, A., & Khan, I. (2025). AI in teacher training and professional development: A tool for continuous learning and skill enhancement. *Review of Education, Administration & Law, 8*(1).

Siddiquah, A., & Salim, Z. (2017). The ICT facilities, skills, usage, and the problems faced by the students of higher education. *EURASIA Journal of Mathematics, Science and Technology Education, 13*(8), 4987–4994.

Simchenko, N. A., & Berkovich, M. L. (2021). Ecosystem designing for the development of universities in a digital environment. *Perspektivy Nauki i Obrazovania, 1*, 491–505.

Singh, B., Gupta, V. K., Jain, A., Vashishth, T., & Sharma, S. (2023). Transforming education in the digital age: A comprehensive study on the effectiveness of online learning. *International Journal of Scientific Research in Engineering and Management, 7*(7), 1–11.

Singun, A. J. (2025). Unveiling the barriers to digital transformation in higher education institutions: A systematic literature review. *Discover Education, 4*(1), 37.

Tariq, N., & Mehmood, N. (2024). Exploring employees' resistance towards digital transformation: A case study of higher education institution. *Journal of Education and Humanities Research, 18*(2), 113–135.

Taribagil, P., Hogg, H. J., Balaskas, K., & Keane, P. A. (2023). Integrating artificial intelligence into an ophthalmologist's workflow: Obstacles and opportunities. *Expert Review of Ophthalmology, 18*(1), 45–56.

Trushkina, N., Abazov, R., Rynkevych, N., & Bakhautdinova, G. (2020). Digital transformation of organizational culture under conditions of the information economy. *Virtual Economics, 3*(1), 7–38.

Vial, G. (2019). Reflections on quality requirements for digital trace data in IS research. *Decision Support Systems, 126*, 113133.

Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. *Computers & Education, 54*(4), 1202–1211.

Yeboah, K. (2013). Exploring the trend of ICT adoption in tertiary institutions in Ghana: A case study at Kwame Nkrumah University of Science and Technology (KNUST). In *Information and Knowledge Management*.

Yin, P., Chen, R., Wang, L., Liu, C., Niu, Y., Wang, W., et al. (2018). The added effects of heatwaves on cause-specific mortality: A nationwide analysis in 272 Chinese cities. *Environment International, 121*, 898–905.

Zabalawi, I., Kordahji, H., & Aftimos, S. (2024). Digital transformation in universities: Strategic framework, implementation tools, and leadership. In *Higher Education in the Arab World: Digital Transformation* (pp. 145–210). Springer Nature Switzerland.

Zeleza, P. T., & Okanda, P. M. (2021). Enhancing the digital transformation of African universities. *Journal of Higher Education in Africa, 19*(1), 1–28.