Digital Technology and Financial Institutions' Sustainability: The Mediating and Moderating Effect of Staff Competency and Training Programs

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Abstract

Purpose: The financial sector is critical in driving sustainable economic growth, yet it is increasingly challenged by global environmental concerns, economic uncertainties, and evolving customer demands for more efficient and transparent services. Sustainability in financial institutions encompasses environmental, social, and economic dimensions, aiming to minimise negative impacts while enhancing long-term value creation. Adopting digital technologies such as artificial intelligence (AI), blockchain, and big data analytics has emerged as a vital strategy for addressing these challenges, promoting operational efficiency, reducing resource consumption, and fostering financial inclusion.

Method: The study adopts a positivist research philosophy, which emphasizes objectivity, quantifiable observations, and statistical analysis to test hypotheses. Due to its efficiency in accessing participants within financial institutions, a convenience sampling technique is employed to select respondents. A sample size of 275 respondents was used for the study. Primary data was collected through a structured survey questionnaire, utilising a Likert scale to measure responses.

Findings: The study concluded that digital technology significantly enhances financial institution sustainability by improving efficiency, reducing costs, and promoting innovation. The study shows a strong relationship between digital technology and staff competency, which significantly contributes to sustainability outcomes. Training programs significantly strengthen the impact of digital technology on staff competency. Staff competency fully mediates the relationship between staff competency and the relationship between digital technology and financial institution sustainability.

Unique Contribution to theory, practice and policy: Managers should view digital transformation not just as a technological shift, but as an enabler of holistic sustainability. Financial institutions should prioritize deploying advanced digital technologies such as artificial intelligence, machine learning, cloud computing, and mobile banking platforms. The study provides evidence-based insights for formulating policies that promote the strategic integration of digital technologies into financial institutions' operations to achieve sustainability goals.

Keywords: Digital Technology; Financial Institutions Sustainability; Staff Competency; Training Programs

1.0 INTRODUCTION

Digital technology has become a cornerstone for fostering sustainability within financial institutions. The financial sector, characterized by dynamic changes and increased global competition, has embraced digital transformation to enhance efficiency, customer experience, and environmental sustainability (Mhlanga, 2020). Digital technology refers to advanced technological tools, including artificial intelligence (AI), blockchain, cloud computing, and big data analytics, which financial institutions employ to streamline operations, reduce costs, and adopt sustainable practices (Wamba et al., 2021). These technologies enable financial institutions to optimize resource allocation, enhance operational efficiency, and align with sustainability goals such as the United Nations' Sustainable Development Goals (SDGs) (United Nations, 2019). The integration of digital technology in financial institutions enhances sustainability by promoting resource efficiency and reducing environmental impact. For instance, digital banking eliminates the need for physical branches, reducing energy consumption and carbon emissions (Kumar et al., 2022).

Furthermore, technologies like blockchain enhance transparency and accountability in financial transactions, fostering trust and ethical practices (Tapscott & Tapscott, 2020). Digital payment systems and mobile banking have also broadened financial inclusion, providing underserved populations access to banking services, thereby contributing to economic sustainability (Ozili, 2021). While digital technology drives sustainability, its effectiveness heavily depends on the competency of staff within financial institutions. Staff competency refers to employees' knowledge, skills, and abilities to leverage digital tools effectively. Competent staff can efficiently implement and manage digital technologies, ensuring alignment with organizational sustainability objectives (Amankwah-Amoah et al., 2020). However, the rapid evolution of digital tools necessitates continuous training programs to equip employees with up-to-date skills and knowledge. Training programs are crucial for fostering a culture of innovation and adaptability, enabling financial institutions to remain competitive in a rapidly changing digital landscape (Sivathanu & Pillai, 2020).

The mediating role of staff competency underscores its critical position in translating digital technology adoption into tangible sustainability outcomes. Competent employees act as catalysts, effectively integrating digital solutions into organizational processes to enhance sustainability. Additionally, training programs serve as a moderating factor, amplifying the relationship between digital technology and sustainability by addressing skill gaps and ensuring effective utilization of digital tools (Asamoah et al., 2021). Without adequate training, the potential benefits of digital technology may be underutilized, leading to inefficiencies and hindering sustainability objectives.

Despite the promising prospects, financial institutions face challenges in integrating digital technology. Issues such as high implementation costs, cybersecurity threats, and resistance to change among employees pose significant barriers (Yip & Bocken, 2020). However, these challenges present opportunities for financial institutions to innovate and build resilience. Strategic investment in digital infrastructure and employee training can mitigate these challenges, positioning institutions to achieve long-term sustainability (Pereira et al., 2022). The nexus between digital technology and financial institutions' sustainability highlights the transformative potential of technology in fostering economic, social, and environmental well-being. The mediating role of staff competency and the moderating impact of training programs are pivotal in ensuring the successful integration of digital tools. Financial institutions that prioritize digital transformation, invest in employee development, and adopt sustainable practices are better positioned to navigate challenges and capitalize on opportunities in an increasingly digitalized world.

1.1 Problem Statement

The financial sector is critical in driving sustainable economic growth, yet it is increasingly challenged by global environmental concerns, economic uncertainties, and evolving customer demands for more efficient and transparent services. Sustainability in financial institutions encompasses environmental, social, and economic dimensions, aiming to minimize negative impacts while enhancing long-term value creation (Mhlanga, 2020). The adoption of digital technologies such as artificial intelligence (AI), blockchain, and big data analytics has emerged as a vital strategy for addressing these challenges, promoting operational efficiency, reducing resource consumption, and fostering financial inclusion (Kumar et al., 2022). However, while the benefits of digital technology are well-documented, its successful implementation and its contribution to sustainability remain contingent upon human factors, particularly staff competency and the availability of training programs (Sivathanu & Pillai, 2020).

Despite increasing investments in digital transformation, many financial institutions face significant barriers to achieving sustainability goals. Research highlights a persistent gap between the adoption of digital technologies and their effective utilization in driving sustainability (Amankwah-Amoah et al., 2020). For example, while blockchain technology enhances transaction transparency and reduces fraud, its implementation often requires specialized knowledge and skills, which many institutions lack (Tapscott & Tapscott, 2020). Moreover, the failure to align digital initiatives with broader sustainability objectives has resulted in fragmented efforts, leading to limited impact and wasted resources (Ozili, 2021).

The competency of staff is a critical determinant of the success of digital technology in enhancing sustainability. Employees must possess the technical expertise and adaptability to navigate complex digital ecosystems and integrate these tools into organizational processes effectively (Asamoah et al., 2021). However, many financial institutions struggle with skill gaps, compounded by the rapid pace of technological advancements (Yip & Bocken, 2020). Training programs are essential in bridging these gaps by equipping employees with the necessary skills to leverage digital tools. Yet, the inadequate design, funding, and implementation of training programs often undermine their effectiveness, leaving institutions ill-prepared to capitalize on the potential of digital technology (Pereira et al., 2022).

Existing literature suggests that staff competency mediates the relationship between digital technology and sustainability outcomes, acting as the bridge that translates technological investments into tangible benefits (Mhlanga, 2020). Without competent staff, even the most advanced digital solutions may fail to achieve desired outcomes. Furthermore, training programs play a moderating role, enhancing the ability of staff to adopt and utilize digital tools effectively. Institutions that prioritize continuous learning and development are more likely to realize the sustainability potential of digital technology (Kumar et al., 2022). However, the inconsistent emphasis on these human factors across financial institutions creates disparities in digital transformation outcomes.

While the importance of digital technology in achieving sustainability is widely recognized, limited empirical research exists on the interplay between digital technology, staff competency, and training programs in the financial sector. Studies often focus on the technological or environmental aspects, neglecting the human dimension that underpins successful implementation (Wamba et al., 2021). Addressing this gap is crucial, as the failure to consider the mediating and moderating effects of staff competency and training programs may undermine the transformative potential of digital technology. The pressing need for sustainability in financial institutions demands a holistic approach that integrates digital technology with human resource development. Investigating the mediating and moderating roles of staff competency and training programs is imperative to provide actionable insights for enhancing sustainability outcomes.

This study aims to fill the identified research gap by exploring these relationships, offering a comprehensive understanding of how financial institutions can harness digital technology to achieve sustainability in a competitive and rapidly evolving global environment.

2.0 LITERATURE REVIEW

2.1 Digital Technology

Digital technology has transformed various industries, revolutionizing business operations, education, healthcare, and governance. It encompasses a wide range of tools, including artificial intelligence (AI), cloud computing, big data analytics, and the Internet of Things (IoT), which enhance efficiency, innovation, and connectivity (Bharadwaj et al., 2019). Digital technology refers to electronic systems, devices, and resources that generate, store, and process data (Chaudhary et al., 2021). It enables seamless communication, automation, and real-time decision-making, significantly improving business efficiency. The evolution of digital technology is closely linked to advancements in computing power, internet connectivity, and data processing capabilities (Yoo et al., 2020). These innovations have driven significant shifts in how organizations operate, interact, and compete in the digital economy. Digital technology is widely applied across multiple industries. Business and Industry: Digital transformation has reshaped traditional business models by incorporating AI-driven analytics, cloud computing, and blockchain technology (Vial, 2019). Companies leverage digital tools to optimize supply chain management, improve customer experiences, and enhance decision-making processes (Kane et al., 2021).

Education: Digital learning platforms, virtual classrooms, and e-learning resources have revolutionized education. Online courses, artificial intelligence-driven personalized learning, and cloud-based education management systems have improved access to knowledge (Selwyn, 2020). Healthcare: Digital health technologies, such as telemedicine, electronic health records (EHR), and wearable devices, have enhanced patient care and medical decision-making (Topol, 2019). AI-powered diagnostics and robotic-assisted surgeries further demonstrate the impact of digital technology in healthcare (He et al., 2021). Finance: The financial sector has embraced digital innovations such as fintech applications, mobile banking, cryptocurrency, and blockchain technology. These advancements have increased financial inclusion and security while improving transactional efficiency (Gomber et al., 2018). Government and Public Services: E-governance, digital identification systems, and data-driven policymaking have enhanced transparency, efficiency, and citizen engagement in public administration (Mergel et al., 2019).

The adoption of digital technology has had profound impacts, including: Increased Efficiency: Automation and digital tools improve operational efficiency, reduce costs, and enhance productivity (Bharadwaj et al., 2019). Innovation and Competitiveness: Businesses that leverage digital technology gain a competitive edge by offering innovative products and services (Vial, 2019). Data-Driven Decision-Making: The use of big data analytics enhances strategic planning and predictive capabilities across industries (Yoo et al., 2020). Challenges and Risks: Despite its advantages, digital technology poses risks such as cybersecurity threats, data privacy concerns, and the digital divide (Chaudhary et al., 2021). Organizations must implement robust security frameworks and digital literacy programs to mitigate these risks. Digital technology continues to reshape industries and economies globally. Its integration into various sectors has improved efficiency, innovation, and connectivity. However, challenges such as cybersecurity risks and digital inequalities must be addressed to maximize the benefits of digital transformation.

2.2 Financial Institution Sustainability

Sustainability has become a critical focus for financial institutions worldwide as they seek to balance economic, environmental, and social objectives. Financial institutions play a vital role in promoting sustainability by integrating environmental, social, and governance (ESG) considerations into their operations, investment decisions, and risk management frameworks (Friede, Busch, & Bassen, 2019). Financial institution sustainability refers to the ability of banks, insurance companies, and other financial entities to operate in a way that ensures long-term financial stability while promoting environmental and social well-being (Weber, 2018). This

concept is closely linked to sustainable finance, responsible banking, and green investments, which emphasize the integration of ESG factors into decision-making processes (Schoenmaker & Schramade, 2019). Sustainability in financial institutions is driven by global frameworks such as the United Nations' Principles for Responsible Banking (PRB) and the Equator Principles, which encourage financial entities to align their operations with the Sustainable Development Goals (SDGs) (UNEP FI, 2020). Institutions that incorporate sustainability principles aim to minimize financial risks, improve corporate reputation, and contribute to economic resilience (Gangi, Mustilli, & Varrone, 2019). Economic sustainability in financial institutions involves ensuring long-term profitability, maintaining financial stability, and effectively managing risks (Scholtens, 2017). Financial institutions must develop strategies to remain competitive while addressing global challenges such as climate change and financial crises. Adopting sustainable finance practices, such as green bonds and impact investing, helps mitigate long-term financial risks and enhance economic resilience (Dorfleitner et al., 2021).

Environmental sustainability focuses on reducing the environmental impact of financial activities through responsible lending, green financing, and investment in renewable energy projects (Clark, Feiner, & Viehs, 2018). Many financial institutions now integrate climate risk assessments into their decision-making processes to mitigate exposure to environmentally harmful industries (Amel-Zadeh & Serafeim, 2018). Regulatory initiatives such as the Task Force on Climate-related Financial Disclosures (TCFD) encourage institutions to disclose their environmental risks and sustainability strategies (FSB, 2021). Social sustainability in financial institutions involves promoting financial inclusion, ensuring fair labor practices, and supporting community development initiatives (Carè, 2018). Financial institutions contribute to social sustainability by offering microfinance, ethical banking, and affordable credit to marginalized populations (Rahman et al., 2020). Moreover, organizations committed to social sustainability uphold ethical business practices, corporate social responsibility (CSR), and stakeholder engagement (Dörry & Schulz, 2018). Strong corporate governance and ethical business practices are essential for financial institution sustainability (Eccles, Ioannou, & Serafeim, 2019). Institutions with transparent governance structures and responsible leadership are more likely to maintain investor trust and regulatory compliance (Garcia et al., 2021). Ethical banking practices, anti-corruption policies, and stakeholder accountability contribute to sustainable financial operations (Birindelli et al., 2019).

Several studies have examined the relationship between sustainability practices and financial performance in financial institutions. Research suggests that institutions adopting ESG principles experience improved financial stability, reduced risk exposure, and enhanced profitability (Friede et al., 2019). Additionally, sustainable banks tend to have better customer loyalty, improved brand reputation, and stronger regulatory compliance (Weber, 2018). Conversely, financial institutions that neglect sustainability considerations face reputational damage, regulatory penalties, and financial instability (Schoenmaker & Schramade, 2019). Therefore, integrating sustainability into financial operations is not only a moral obligation but also a strategic necessity for long-term growth and resilience. Financial institution sustainability is a multidimensional concept that integrates economic, environmental, social, and governance factors into financial decision-making. Institutions that adopt sustainable finance practices enhance their financial performance, mitigate risks, and contribute to global sustainability efforts. As regulatory frameworks and stakeholder expectations evolve, financial institutions must continue to innovate and strengthen their sustainability strategies.

2.2.1 Staff Competency

Staff competency is a critical factor influencing organizational performance, operational efficiency, and competitive advantage. Competency refers to a combination of knowledge, skills, abilities, and behaviors that enable employees to perform their job roles effectively (Boyatzis, 2019). Organizations that invest in competency development enhance workforce productivity,

improve service delivery, and foster innovation (Hidayat & Firman, 2020). Staff competency is broadly defined as the ability of employees to apply their knowledge, skills, and behaviors to achieve organizational goals (Spencer & Spencer, 2019). Competency models are often used to assess and develop employee capabilities, ensuring alignment with business strategies (Mulder, 2017). These models typically encompass technical, managerial, and behavioral competencies that influence job performance and career progression (Goleman, Boyatzis, & McKee, 2018). In modern organizations, competency frameworks serve as guidelines for recruitment, training, performance evaluation, and succession planning (Sanghi, 2016). Companies that prioritize staff competency development enhance employee engagement, reduce turnover, and improve overall business resilience (Salas et al., 2017). Technical competency refers to the specialized knowledge and skills required to perform job-specific tasks effectively (Mulder, 2017). Employees in fields such as accounting, engineering, and information technology must continuously upgrade their technical skills to remain relevant in dynamic work environments (Eraut, 2019).

Organizations that invest in technical training improve workforce efficiency, reduce errors, and enhance service quality (Collin et al., 2021). Managerial competency involves the ability to lead teams, make strategic decisions, and manage organizational resources effectively (Boyatzis, 2019). Leadership skills, problem-solving abilities, and communication effectiveness are key aspects of managerial competency (Yukl, 2020). Organizations with competent managers experience higher employee motivation, better decision-making, and improved organizational performance (Dixon et al., 2017). Behavioral competency relates to the attitudes, values, and interpersonal skills that influence employee interactions and workplace culture (Goleman et al., 2018). Emotional intelligence, teamwork, adaptability, and ethical decision-making are essential behavioral competencies that impact organizational success (Salas et al., 2017). Employees with strong behavioral competencies contribute to a positive work environment, effective collaboration, and enhanced customer satisfaction (Lievens & Sackett, 2017).

With the increasing digitalization of business operations, digital competency has become a crucial aspect of workforce development (van Laar et al., 2020). Employees must possess digital literacy, data analytics skills, and the ability to leverage emerging technologies to drive innovation and efficiency (Hidayat & Firman, 2020). Organizations that enhance digital competency among employees improve agility, cybersecurity awareness, and technological adoption (Chaka, 2020).

Several studies have demonstrated a strong link between staff competency and organizational performance. Competent employees enhance operational efficiency, reduce workplace errors, and improve customer satisfaction (Collin et al., 2021). Furthermore, organizations with highly skilled staff experience greater innovation, better adaptability to market changes, and higher profitability (Salas et al., 2017). In the financial sector, for example, staff competency is essential for ensuring compliance with regulatory standards, reducing fraud risks, and enhancing financial decision-making (Dixon et al., 2017). In manufacturing, technical and managerial competencies contribute to improved production efficiency and quality control (Eraut, 2019). Conversely, a lack of staff competency can lead to operational inefficiencies, increased employee turnover, and reduced organizational competitiveness (Goleman et al., 2018).

Companies that fail to invest in workforce development face difficulties in retaining top talent and responding to industry changes (Lievens & Sackett, 2017). Training and Development: Continuous professional development programs help employees upgrade their skills and stay competitive in their fields (Sanghi, 2016). Mentorship and Coaching: Pairing employees with experienced mentors enhances learning and leadership development (Boyatzis, 2019). Competency-Based Assessments: Using structured evaluation frameworks ensures that employees meet required competency levels (Mulder, 2017). Technology Integration: Digital learning platforms and artificial intelligence-based training enhance skill acquisition and knowledge retention (Chaka, 2020). Staff competency is a fundamental driver of organizational success. By developing technical, managerial, behavioral, and digital competencies, companies can enhance workforce productivity, improve service quality, and maintain competitive

advantage. Organizations must invest in competency development initiatives to adapt to technological advancements, regulatory changes, and evolving market demands.

2.2.2 Training Programs

Training programs play a crucial role in enhancing employee skills, knowledge, and performance in organizations. Effective training not only improves individual competencies but also contributes to overall organizational growth and competitiveness (Salas et al., 2017). With the rapid advancement of technology and evolving market demands, continuous learning and professional development have become imperative for businesses (Noe et al., 2020). Training programs refer to structured learning activities designed to improve employees' knowledge, skills, and abilities to enhance their job performance (Aguinis & Kraiger, 2009). Training can be formal or informal, on-the-job or off-the-job, and can include various methods such as workshops, seminars, e-learning, coaching, and mentorship (Salas et al., 2017). Effective training programs align with organizational goals and help employees adapt to changes in business environments (Jehanzeb & Bashir, 2019). According to Armstrong and Taylor (2020), training is not just about skill acquisition but also about fostering motivation, engagement, and career growth. Organizations that invest in training programs cultivate a skilled workforce capable of meeting industry demands and driving innovation (Noe et al., 2020).

On-the-job training involves learning while performing job tasks under supervision (Saks & Burke, 2012). This type of training is effective in familiarizing employees with real work scenarios and improving practical skills (Aguinis & Kraiger, 2009). Examples include job shadowing, coaching, and mentorship programs. Off-the-job training occurs outside the workplace and includes formal education, workshops, and external training programs (Armstrong & Taylor, 2020). This method is useful for specialized skills development and exposure to industry best practices (Jehanzeb & Bashir, 2019). With the advancement of technology, e-learning has become a popular method of training. Online courses, virtual simulations, and digital learning platforms offer flexible and cost-effective training solutions (Noe et al., 2020). Digital training ensures continuous learning without geographical limitations, making it accessible to employees across different locations (Salas et al., 2017).

Leadership training focuses on developing managerial competencies, decision-making skills, and strategic thinking (Lacerenza et al., 2017). Organizations that invest in leadership development create a strong pipeline of future leaders, enhancing business sustainability (Aguinis & Kraiger, 2009). Technical training provides employees with industry-specific knowledge and hands-on skills required for their roles (Saks & Burke, 2012). In fields such as finance, healthcare, and IT, technical training is essential for compliance, operational efficiency, and quality assurance (Jehanzeb & Bashir, 2019). Numerous studies highlight the positive relationship between training programs and organizational performance. Well-trained employees demonstrate higher productivity, improved job satisfaction, and better service quality (Salas et al., 2017). Organizations that prioritize training witness lower turnover rates, as employees feel valued and invested in their career growth (Noe et al., 2020).

According to Armstrong and Taylor (2020), training programs enhance employee engagement by fostering a learning culture within organizations. Engaged employees are more committed, innovative, and adaptable to change, leading to increased business efficiency and competitive advantage (Jehanzeb & Bashir, 2019). Additionally, training plays a critical role in risk management and compliance. In regulated industries, continuous training ensures employees adhere to legal requirements, reducing risks of non-compliance and financial penalties (Lacerenza et al., 2017). Despite their benefits, training programs face challenges such as high costs, time constraints, and resistance from employees (Saks & Burke, 2012). Many organizations struggle with measuring training effectiveness, making it difficult to justify investments (Aguinis & Kraiger, 2009). Moreover, some employees may be reluctant to participate in training due to fear of change or increased workload (Noe et al., 2020). To address these

challenges, organizations should design training programs that are relevant, engaging, and aligned with business objectives (Salas et al., 2017). Adopting a blended learning approach, combining in-person and digital training, can enhance accessibility and cost-efficiency (Lacerenza et al., 2017). Training programs are essential for developing a skilled and motivated workforce. Different types of training, such as on-the-job training, leadership development, and digital learning, contribute to employee growth and organizational success. Organizations that invest in continuous training enhance employee performance, job satisfaction, and competitive advantage. However, challenges such as cost and resistance to change must be addressed to maximize training effectiveness.

2.3 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory, introduced by Barney (1991), posits that an organization's sustainable competitive advantage stems from its ability to acquire and utilize valuable, rare, inimitable, and non-substitutable (VRIN) resources. Digital technology, staff competency, and training programs serve as strategic resources that drive financial institutions' sustainability. RBV suggests that digital technologies, such as artificial intelligence, blockchain, and fintech innovations, become valuable assets when they are effectively integrated into financial institutions (Teece, 2018). However, their successful deployment depends on the institution's ability to develop staff competencies through continuous training (Grant, 1996). Skilled employees can harness digital tools efficiently, leading to operational efficiency, enhanced customer service, and financial stability (Barney, 1991). The RBV theory supports the notion that staff competency mediates the relationship between digital technology and sustainability. While digital technologies provide the infrastructure for innovation, employees' ability to adapt and maximize these technologies determines their overall impact (Teece, 2018).

Financial institutions that prioritize skills development through training can better leverage technology to improve risk management, service delivery, and financial performance (Barney, 1991). RBV also explains how training programs moderate the effectiveness of digital technology in driving sustainability. Continuous learning ensures employees remain updated on technological advancements, compliance requirements, and emerging financial risks (Grant, 1996). Institutions that invest in training cultivate a workforce that can utilize digital resources effectively, leading to sustainable competitive advantage (Teece, 2018). Empirical studies confirm that financial institutions with well-trained employees are more likely to achieve long-term sustainability through digital innovation (Mikalef et al., 2020). For instance, firms that integrate digital banking solutions while investing in employee digital literacy report increased efficiency and customer satisfaction (Barney, 1991; Teece, 2018).

2.3.1 Technology-Organization-Environment (TOE) Theory

The Technology-Organization-Environment (TOE) framework, developed by Tornatzky and Fleischer (1990), explains how organizations adopt and implement new technologies based on technological, organizational, and environmental factors. This theory is widely applied in understanding digital transformation in financial institutions. The TOE framework posits that financial institutions' sustainability is influenced by three critical dimensions: Technology Factors – The adoption of digital technologies, such as AI-driven risk assessment and cloud-based banking, enhances efficiency and service quality (Tornatzky & Fleischer, 1990). Organizational Factors – Internal capabilities, including staff competency and training programs, determine how effectively an institution can integrate and leverage digital technology (Baker, 2012). Environmental Factors – Regulatory policies, market competition, and customer expectations influence how financial institutions implement digital transformation (Oliveira & Martins, 2011). TOE theory suggests that staff competency mediates digital technology's impact on financial sustainability. Employees with digital skills are better equipped to handle

cybersecurity threats, fintech innovations, and automation, leading to increased operational resilience (Baker, 2012).

Training programs play a moderating role by enhancing employees' adaptability to digital transformations. According to Oliveira and Martins (2011), financial institutions with robust training strategies can overcome resistance to digital adoption, ensuring smooth transitions and long-term sustainability. Research supports the TOE framework's relevance in financial institutions. Studies show that organizations that align technology adoption with staff training and competency development experience higher financial sustainability (Baker, 2012; Oliveira & Martins, 2011). For instance, banks that implement AI-driven customer service solutions while continuously training employees report improved efficiency and customer retention (Tornatzky & Fleischer, 1990). Both Resource-Based View (RBV) Theory and the Technology-Organization-Environment (TOE) Framework provide strong theoretical foundations for understanding how digital technology influences financial institutions' sustainability. The RBV highlights how digital tools, staff competency, and training programs serve as strategic resources for achieving competitive advantage, while the TOE framework emphasizes the interplay between technological, organizational, and environmental factors in driving digital transformation. By considering these theories, financial institutions can develop strategic approaches to leveraging technology for long-term sustainability.

Figure 1. Conceptual Framework
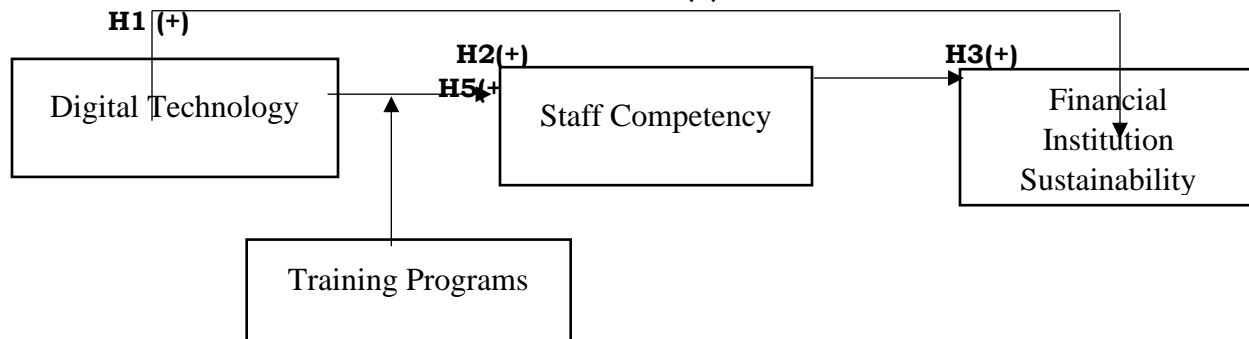
2.4 Relationship between digital technology and financial institution sustainability

The adoption of digital technology in financial institutions has become a crucial driver of sustainability, enhancing operational efficiency, financial inclusion, and risk management. Digital innovations such as artificial intelligence (AI), blockchain, big data analytics, and cloud computing enable financial institutions to streamline processes, improve decision-making, and enhance customer experience (Nwankpa & Datta, 2020). These technological advancements contribute to cost reduction, increased revenue generation, and enhanced service delivery, which are essential for financial sustainability (Gomber, Kauffman, Parker, & Weber, 2018). One of the significant ways digital technology enhances financial institution sustainability is through increased financial inclusion. Mobile banking, digital payment platforms, and fintech solutions allow financial institutions to expand their services to underserved populations, thereby increasing their customer base and revenue streams (Koomson, Bukari, & Villano, 2021). Studies have shown that financial institutions that leverage digital solutions improve their operational resilience and long-term stability (Arner, Barberis, & Buckley, 2019).

Moreover, digital technology strengthens risk management by providing real-time data analytics, fraud detection mechanisms, and cybersecurity solutions. AI-powered fraud detection systems and machine learning algorithms help financial institutions identify suspicious activities and mitigate potential financial threats (Tarhini, Alalwan, Al-Qirim, & Algharabat, 2021). By reducing financial fraud and enhancing security, digital technologies promote institutional trust

and stability, thereby reinforcing sustainability. However, while digital technology plays a critical role in financial sustainability, its effectiveness depends on staff competency and continuous training programs. Financial institutions must invest in digital skills development to ensure employees can effectively utilize advanced technologies (Fadli, Alam, & Shamsuddin, 2020). Proper integration of digital solutions, coupled with skilled personnel, enhances financial institutions' competitive advantage and long-term sustainability (Agyekum, Nyarku, & Boadi, 2022). Based on the literature, the following hypothesis is proposed:

H1: Digital technology adoption has a positive and significant effect on financial institution sustainability.

2.4.1 Relationship between staff competency and financial institution sustainability

Staff competency plays a crucial role in ensuring the sustainability of financial institutions by enhancing operational efficiency, innovation, and risk management. Competent employees possess the necessary skills, knowledge, and experience to navigate the evolving financial landscape, effectively utilizing digital technologies and implementing strategic decisions that drive institutional growth and resilience (Wambua & Mugambi, 2020). Skilled personnel improve service quality, regulatory compliance, and customer satisfaction, all of which are critical for long-term financial sustainability (Alhassan & Asare, 2021). One of the key aspects of staff competency that influences financial institution sustainability is digital proficiency. With the increasing adoption of financial technologies (fintech), employees with strong digital skills can effectively integrate new systems, optimize digital services, and enhance cybersecurity measures, thereby improving the institution's competitive advantage (Eze et al., 2021).

Additionally, competent staff members contribute to effective risk management by accurately assessing financial risks and implementing strategic mitigation measures (Mhlanga, 2020). Furthermore, employee competency is linked to innovation and adaptability, which are vital for financial institutions operating in dynamic economic environments. Financial institutions that invest in continuous training and capacity-building programs equip their staff with the latest industry knowledge, allowing them to respond proactively to market trends and regulatory changes (Yeboah & Koffie, 2019). Without competent personnel, financial institutions may struggle with inefficiencies, increased operational costs, and regulatory non-compliance, ultimately threatening their sustainability (Osei & Boateng, 2022). Based on the literature, the following hypothesis is proposed:

H2: Staff competency has a positive and significant effect on financial institution sustainability.

2.4.2 Relationship between digital technology and staff competency

Digital technology plays a crucial role in enhancing staff competency by providing employees with the necessary tools, knowledge, and skills to perform their tasks efficiently. The integration of digital technologies in financial institutions enables employees to automate processes, improve decision-making, and adapt to technological advancements, thereby enhancing their overall competency (Eze et al., 2021). With the rise of artificial intelligence (AI), big data analytics, and financial technology (FinTech) solutions, financial institutions increasingly rely on employees who can effectively use these digital tools to improve service delivery and operational efficiency (Mhlanga, 2020). Moreover, digital technology facilitates continuous learning and professional development through e-learning platforms, virtual training programs, and knowledge-sharing systems.

These technologies provide employees with opportunities to upgrade their skills in areas such as cybersecurity, data analytics, and regulatory compliance, which are essential for financial institution sustainability (Alhassan & Asare, 2021). Additionally, digital tools improve staff performance by reducing manual errors and enhancing communication and collaboration among employees, further strengthening their competencies (Osei & Boateng, 2022). Despite its benefits, the effective use of digital technology requires financial institutions to invest in digital

literacy and training programs to ensure employees can fully utilize available digital tools. Without proper training, employees may struggle to adapt to new technologies, leading to inefficiencies and resistance to change (Yeboah & Koffie, 2019). Therefore, a strong relationship exists between digital technology and staff competency, where digital innovations enhance employee skillsets, and competent staff drive the successful implementation of digital systems. Based on the literature, the following hypothesis is proposed:

H3: Digital technology has a positive and significant effect on staff competency.

2.4.3 Mediating effect of staff competency on the relationship between digital technology and financial institution sustainability

The adoption of digital technology in financial institutions enhances efficiency, risk management, and service delivery, all of which contribute to sustainability (Eze et al., 2021). However, the extent to which digital technology improves financial institution sustainability depends on the competency of staff who interact with these technologies. Staff competency, which includes digital literacy, problem-solving skills, and adaptability, serves as a crucial factor in ensuring that digital technologies are effectively utilized to achieve organizational sustainability goals (Alhassan & Asare, 2021). Digital technology alone may not automatically lead to sustainability if employees lack the necessary skills to manage and optimize these tools (Mhlanga, 2020). For instance, advanced banking technologies such as artificial intelligence (AI), blockchain, and data analytics require competent staff to interpret insights, manage risks, and ensure regulatory compliance (Osei & Boateng, 2022).

When financial institutions invest in both digital technologies and employee skill development, they are more likely to experience improved efficiency, reduced operational costs, and enhanced customer satisfaction, all of which contribute to long-term sustainability (Yeboah & Koffie, 2019). Thus, staff competency acts as a mediator in the relationship between digital technology and financial institution sustainability. It enhances the effectiveness of digital tools by ensuring that employees can fully leverage technological advancements to improve financial performance, regulatory compliance, and overall institutional resilience. Based on the literature, the study hypothesized that:

H4: Staff competency mediates the relationship between digital technology and financial institution sustainability.

2.4.4 Moderating effect of training programs on the relationship between digital technology and staff competency

The integration of digital technology in financial institutions requires employees to develop new skills to effectively utilize these technologies (Eze et al., 2021). However, staff competency levels vary, and without adequate training, employees may struggle to fully leverage digital tools, limiting their potential impact on institutional efficiency and sustainability (Mhlanga, 2020). Training programs play a crucial moderating role in strengthening the relationship between digital technology and staff competency by equipping employees with the necessary knowledge and skills to use technology effectively (Alhassan & Asare, 2021). Training programs enhance employees' ability to adapt to new technological advancements, improve problem-solving capabilities, and increase digital literacy, all of which contribute to better technology utilization (Boateng & Osei, 2022).

Studies have shown that organizations that invest in continuous training experience higher employee competency, leading to increased innovation and productivity (Yeboah & Koffie, 2019). Furthermore, training programs tailored to digital transformation help employees overcome resistance to change and foster a culture of technological adoption (Chinedu-Eze et al., 2021). When financial institutions implement structured and ongoing training initiatives, employees are better positioned to integrate digital technology into their daily operations effectively. This, in turn, enhances work performance, decision-making, and operational

efficiency, reinforcing the positive impact of digital technology on staff competency. Therefore, training programs serve as a key moderating factor, strengthening the relationship between digital technology and staff competency. Based on the literature, the following hypothesis is proposed:

H5: Training programs moderate the relationship between digital technology and staff competency, such that the relationship is stronger when training programs are effectively implemented.

3.0 METHODOLOGY

The study employs an explanatory research design, which is appropriate for examining causal relationships between variables. This design enables an in-depth analysis of how digital technology influences financial institution sustainability and the role of staff competency and training programs. The study adopts a positivist research philosophy, which emphasizes objectivity, quantifiable observations, and statistical analysis to test hypotheses. A convenience sampling technique is employed to select respondents due to its efficiency in accessing participants within financial institutions. A sample size of 275 respondents was used. A primary data is collected through a structured survey questionnaire, utilizing a Likert scale to measure responses

4.0 DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 Reliability and Validity

Reliability and validity tests were conducted to ensure the robustness and credibility of the research findings. Reliability refers to the internal consistency of the measurement items, which was assessed using Cronbach's Alpha. According to Hair et al. (2019), a Cronbach's Alpha value of 0.70 or higher indicates an acceptable level of reliability. In this study, all constructs recorded Cronbach's Alpha values above the recommended threshold, confirming that the instrument is reliable and consistent in measuring the intended variables. Validity, on the other hand, assesses the extent to which the questionnaire accurately captures the constructs it is intended to measure. Content validity was ensured through a rigorous review of literature and the adaptation of measurement items from previous validated studies (Saunders et al., 2019).

In addition, the questionnaire was reviewed by academic experts and practitioners in the field to confirm its relevance, clarity, and comprehensiveness. Construct validity was further assessed through factor analysis, ensuring that the items loaded appropriately onto their respective constructs. The combination of these methods provides strong evidence that the instrument used in the study is both valid and reliable, thus supporting the integrity of the data collected and the findings derived from it.

Table 4.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.797
Bartlett's Test of Sphericity	Approx. Chi-Square	1785.994
	df	91
	Sig.	.000

Table 4.1 presents the results of the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, which are preliminary tests used to evaluate the suitability of the data for factor analysis. The KMO value of 0.797 exceeds the recommended minimum threshold of 0.70, indicating that the sample is adequate and the data are appropriate for factor analysis (Kaiser, 1974). A KMO value between 0.70 and 0.80 is considered "middling" to "meritorious", suggesting that partial correlations among variables are relatively small, and that patterns of correlations are compact enough to yield distinct and reliable factors. Furthermore, the Bartlett's Test of Sphericity yielded a Chi-Square value of 1785.994 with 91

degrees of freedom and a significance level of .000 (p < 0.001). This significant result rejects the null hypothesis that the correlation matrix is an identity matrix, which implies that there are adequate relationships among variables to proceed with factor analysis (Bartlett, 1950). Both the KMO and Bartlett's test results provide strong evidence that the data meet the requirements for exploratory factor analysis, supporting the validity of conducting further dimensionality reduction or scale validation procedures.

Table 4.2 Reliability and Validity Results

Constructs	Cronbach's Alpha	Convergent validity	Discriminant Validity	Composite Reliability
Digital Technology Adoption	.744	0.6140	0 .784	0.888
Financial Institutions Sustainability	.719	0.679	0.792	0.891
Staff Competency	.805	0.622	0.789	0.943
Training Programs	.907	0.677	0.759	0.956

Table 4.2 presents the reliability and validity assessments for the key constructs in the study: Digital Technology Adoption, Financial Institutions Sustainability, Staff Competency, and Training Programs. The results demonstrate that the measurement model meets the criteria for internal consistency reliability, convergent validity, and discriminant validity. All constructs exceed the recommended threshold of 0.70 for Cronbach's Alpha, indicating acceptable to excellent internal consistency among the items within each construct (Hair et al., 2019). Specifically, Training Programs recorded the highest alpha value (.907), suggesting a very strong correlation among its items.

Similarly, Composite Reliability (CR) values for all constructs are well above the recommended cutoff of 0.70, ranging from 0.888 to 0.956, further confirming the reliability and consistency of the measurement scales. The Average Variance Extracted (AVE), representing convergent validity, is acceptable for all constructs. Each construct has an AVE greater than 0.50, ranging from 0.614 (Digital Technology Adoption) to 0.679 (Financial Institutions Sustainability). These values indicate that, on average, more than 50% of the variance in the observed variables is explained by the underlying latent construct, supporting construct validity (Fornell & Larcker, 1981).

The square root of the AVE for each construct, shown in the Discriminant Validity column, exceeds the inter-construct correlations (assumed to be below these values), meeting the Fornell-Larcker criterion for discriminant validity. Values range from 0.759 to 0.792, signifying that each construct is empirically distinct from the others in the model. Overall, the findings in Table 4.3 provide strong evidence that the measurement model is reliable and valid. All constructs meet the recommended thresholds for Cronbach's Alpha, AVE, discriminant validity, and composite reliability. These results affirm that the items used to measure each construct are both consistent and theoretically sound, enabling robust structural model assessment.

Table 4.3 Items Factor Loadings

Digital Technology Adoption		Financial Institutions Sustainability		Staff Competency		Training Programs	
Items	Loadings	Items	Loadings	Items	Loadings	Items	Loadings
DTA1	.762	FIS1	.756	TPG1	.788	SCT1	.806
DAT2	.830	FIS2	.715	TPG2	.791	SCT2	.820
DTA3	.700	FIS3	.679	TPG3	.787	SCT3	.751
DTA4	.800	FIS4	.538	TPG4	.793	SCT4	.819
DTA5	.820	FIS5	.659	TPG5	.765	SCT5	.789
		FIS6	.621	TPG6	.842	SCT6	.730
		FIS7	.653	TPG7	.842	SCT7	.784
		FIS8	.804	TPG8	.794	SCT8	.682
		FIS9	.762	TPG9	.725	SCT9	.767
				TPG10	.755	SCT10	.739
						SCT11	.728
						SCT12	.834
						SCT13	.746
						SCT14	.774
						SCT15	.651
						SCT16	.704

Table 4.3 presents the factor loadings for the items measuring the four main constructs in this study: Digital Technology Adoption (DTA), Financial Institutions Sustainability (FIS), Staff Competency (SCT), and Training Programs (TPG). Factor loading values are critical in evaluating the construct validity of the measurement model, as they represent the degree to which each observed variable (item) correlates with its underlying latent construct. The factor loadings for Digital Technology Adoption range from .700 to .830, indicating strong associations between items DTA1 to DTA5 and the latent variable. According to Hair et al. (2019), loadings above 0.70 are ideal, though loadings above 0.60 are still acceptable, particularly in exploratory studies. This suggests that the five indicators are reliable representations of the construct. For Financial Institutions Sustainability, loadings range from .538 to .804 across nine items (FIS1–FIS9). While most items meet the minimum acceptable threshold, FIS4 (.538) and FIS6 (.621) fall slightly below the preferred value of 0.70, suggesting a relatively weaker correlation. However, these items may still be retained if they contribute to content validity and the overall composite reliability remains high (which, in this study, it does).

All ten items measuring Training Programs exhibit strong factor loadings between .725 and .842. These high loadings suggest that each item contributes significantly to explaining the underlying construct. The consistency in item performance highlights that the construct has been well operationalized. Staff Competency includes sixteen items with factor loadings ranging from .651 to .834. Although SCT15 (.651) is slightly below the optimal 0.70 threshold, the majority of items fall within acceptable to excellent ranges. This wide item pool provides a robust measure of the construct, enhancing both its reliability and validity. The factor loadings presented in Table 4.4 support the construct validity of the measurement model. Most loadings exceed the recommended threshold of 0.70, indicating a strong association between the items and their respective latent constructs. A few items fall slightly below the threshold, but can still be retained when justified theoretically or statistically (Hair et al., 2019). The high factor loadings contribute to the strong convergent validity and internal consistency reliability observed in prior analyses.

4.2 Effect of Digital Technology on Financial Institution Sustainability

The 4.9 presents the results of a simple linear regression analysis conducted to assess the effect of Digital Technology (DGT) on Financial Institution Sustainability (FIS). The analysis includes model summary, ANOVA, and coefficients to evaluate the strength and significance of the relationship.

Table 4.4 Effect of Digital Technology on Financial Institution Sustainability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.232a	.054	.050	1.019	
		ANOVAa			
	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.788	1	15.788	15.208	.000b
Residual	278.212	268	1.038		
		Coefficientsa			
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
	2.534	.214		11.833	.000
DGT	.233	.060	.232	3.900	.000

a. Dependent Variable: FIS= Financial Institution Sustainability
b. Predictors: (Constant), DGT= Digital Technology

The R = 0.232 indicates a weak positive correlation between digital technology and financial institution sustainability. The R Square = 0.054 suggests that digital technology explains about 5.4% of the variance in financial institution sustainability. Adjusted R Square = 0.050 confirms the slight explanatory power of the model even when accounting for the sample size. The standard error of the estimate = 1.019 indicates the average distance between the observed and predicted values. While the relationship is statistically significant, digital technology alone accounts for a modest proportion of the variation in sustainability. This suggests other factors also play a substantial role in influencing sustainability. The F-value = 15.208 with a p-value = 0.000 indicates that the model is statistically significant overall. The model significantly predicts financial institution sustainability, confirming that digital technology contributes meaningfully, albeit moderately, to the outcome.

The unstandardized coefficient (B) for DGT = 0.233, showing that a one-unit increase in digital technology is associated with a 0.233 unit increase in sustainability. The t-value = 3.900 and p-value = 0.000 imply that this effect is highly significant. The Beta coefficient = 0.232 (standardized) reaffirms the positive influence of digital technology on sustainability. Digital technology has a positive and statistically significant impact on financial institution sustainability, though the effect size is relatively small (Beta = 0.232). This means that while digital technology plays a role in promoting sustainability, it is likely one part of a broader strategy involving factors such as regulatory compliance, staff competency, customer engagement, and operational efficiency. To strengthen sustainability, institutions should complement digital initiatives with other strategic and organizational capabilities.

4.3 Effect of Digital Technology on Staff Competency

Table 4.10 presents the results of a linear regression analysis investigating the impact of Digital Technology (DGT) on Staff Competency (SCT). The analysis includes the model summary, ANOVA, and coefficients table, which together provide insights into the strength, direction, and significance of the relationship.

Table 4.5 Effect of Digital Technology on Staff Competency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
2	.697a	.486	.484	.751	
		ANOVAa			
	Sum of Squares	df	Mean Square	F	Sig.
Regression	142.743	1	142.743	252.916	.000b
Residual	151.257	268	.564		
		Coefficientsa			
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
	1.181	.143		8.266	.000
DGT	.665	.042	.697	15.903	.000

a. Dependent Variable: SCT= Staff Competency
b. Predictors: (Constant), DGT= Digital Technology

The R = 0.697 indicates a strong positive correlation between digital technology and staff competency. The R Square = 0.486 shows that digital technology explains 48.6% of the variance in staff competency. Adjusted R Square = 0.484 confirms this high explanatory power after adjusting for sample size. Standard error of the estimate = 0.751 reflects relatively low variability around the regression line. The F-value = 252.916 and p-value = 0.000 demonstrate that the model is highly statistically significant. The regression model provides a significantly better fit than a model without the predictor.

Therefore, digital technology significantly influences staff competency. The unstandardized coefficient (B) = 0.665 implies that for every one-unit increase in digital technology, staff competency increases by 0.665 units. The t-value = 15.903 with a p-value = 0.000 signifies that this relationship is highly statistically significant. The standardized Beta = 0.697 reflects a strong effect size, confirming that digital technology is a major driver of staff competency. Digital technology has a strong, positive, and statistically significant effect on staff competency. The high R Square value of 0.486 suggests that nearly half of the changes in staff competency can be explained by advancements and integration of digital technologies. This underscores the importance of digital tools and systems in enhancing staff knowledge, decision-making, problem-solving, adaptability, and communication. In practice, this finding emphasizes the need for financial institutions and organizations to invest in digital technologies and continuous digital training to boost staff performance and sustain competitive advantage.

4.4 Effect of Staff Competency on Financial Institution Sustainability

Table 4.10 presents the results of a linear regression analysis examining the impact of Staff Competency (SCT) on Financial Institution Sustainability (FIS). The analysis consists of three key parts: the model summary, ANOVA table, and coefficients table.

Table 4.6 Effect of Staff Competency on Financial Institution Sustainability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
3	.470a	.221	.218	.925	
		ANOVAa			
	Sum of Squares	df	Mean Square	F	Sig.
Regression	64.896	1	64.896	75.913	.000b
Residual	229.104	268	.855		

		Coefficientsᵃ			
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
	1.808	.184		9.830	.000
SCT	.469	.054	.470	8.713	.000

a. Dependent Variable: FIS= Financial Institution Sustainability
b. Predictors: (Constant), SCT= Staff Competency

The R = 0.470 indicates a moderate positive correlation between staff competency and financial institution sustainability. The R Square = 0.221 reveals that 22.1% of the variance in financial institution sustainability is explained by staff competency. The F-value = 75.913 and p-value = 0.000 indicate that the regression model is highly statistically significant. The model significantly improves the prediction of financial institution sustainability compared to a model without staff competency as a predictor.

The unstandardized coefficient (B) = 0.469 shows that a one-unit increase in staff competency leads to a 0.469-unit increase in financial institution sustainability. The t-value = 8.713 with a p-value = 0.000 confirms that this effect is statistically significant. The standardized Beta = 0.470 indicates a moderate effect size. The results show that staff competency has a positive and significant effect on financial institution sustainability. With an R Square of 0.221, the model demonstrates that staff competency accounts for over one-fifth of the variability in sustainability performance, a noteworthy proportion in organizational studies.

This implies that when employees possess relevant knowledge, skills, adaptability, and problem-solving abilities, the institution is more likely to sustain its operations, performance, and strategic goals. Therefore, enhancing staff competency through continuous professional development, training, and digital skill adoption is critical for promoting long-term sustainability in the financial sector.

4.5 Moderating Effect of Training Programs on the Relationship Between Digital Technology and Staff Competency

This table presents the results of a moderation analysis investigating whether Training Programs (TRP) moderate the relationship between Digital Technology (DGT) and Staff Competency (SCT).

Table 4.7 Moderating effect of Training Programs on the relationship between Digital Technology and Staff Competency

R	R-sq	MSE	F	df1	df2	p
.7733	.5980	.4043	139.3526	3.0000	281.0000	.0000
	coeff	se	t	p	LLCI	ULCI
Constant	2.8959	.5421	5.3419	.0000	3.9631	1.8288
DGT	1.2982	.1502	8.6443	.0000	1.0026	1.5939
TRP	1.3913	.1542	9.0204	.0000	1.0877	1.6949
Int_1	.2471	.0403	6.1382	.0000	.3263	.1678

The R = 0.7733: This indicates a strong positive correlation between the combined variables (DGT, TRP, and their interaction) and Staff Competency. The R-squared = 0.5980: About 59.8% of the variance in Staff Competency is explained by the model, which includes digital technology, training programs, and their interaction. F = 139.35 with p < 0.001: The model is highly statistically significant, indicating that the predictors together reliably explain variance in staff competency. The model is a good fit and all three predictors (DGT, TRP, interaction) significantly contribute to explaining staff competency. The findings strongly support the moderating role of Training Programs in the relationship between Digital Technology and Staff

Competency. Both Digital Technology and Training Programs individually have a strong positive effect on staff competency. The positive interaction effect (B = 0.2471) indicates that when training programs are in place, the impact of digital technology on enhancing staff competency is amplified. Organizations should not only invest in digital technology but also implement relevant training programs to ensure staff can fully leverage technological tools. Training enhances digital literacy, adaptability, and skill application, ultimately fostering a more competent and agile workforce.

4.6 Mediating Effect of Staff Competency on the Relationship Between Digital Technology and Financial Institution Sustainability

This table 4.12 presents the mediation analysis that examines whether Staff Competency (SCT) mediates the relationship between Digital Technology (DGT) and Financial Institution Sustainability (FIS).

Table 4.8 Mediating effect of Staff Competency on the relationship between Digital Technology and Financial Institution Sustainability

R	R-sq	MSE	F	df1	df2	p
.4942	.2442	.6840	45.5557	2.0000	282.0000	.0000
	coeff	se	t	p	LLCI	ULCI
Constant	.8763	.3064	2.8600	.0046	.2732	1.4794
DTG	.0240	.0574	.4174	.6767	.0891	.1370
SCT	.5833	.0628	9.2857	.0000	.4597	.7070
Direct effect of SCT on FIS						
	Effect	se	t	p	LLCI	ULCI
	.0240	.0574	.4174	.6767	.0891	.1370
Indirect effect(s) of SCT on FIS						
	Effect	BootSE	BootLLCI	BootULCI		
SCT	.1007	.0320	.0425	.1691		

The R = 0.4942, indicating a moderate correlation between the predictors and FIS. R² = 0.2442, suggesting that 24.42% of the variance in Financial Institution Sustainability is explained by the model. F = 45.56 with p < 0.001, showing that the overall model is statistically significant. Direct Effect of Digital Technology on Financial Institution Sustainability Coefficient: 0.0240 p = 0.6767 (not significant) 95% CI includes zero: (-0.0891, 0.1370). Digital Technology alone does not significantly influence Financial Institution Sustainability when Staff Competency is included in the model. Indirect Effect (Mediation Path: DGT → SCT → FIS). Effect: 0.1007. Bootstrapped 95% CI: (0.0425, 0.1691).

Since the confidence interval does not include zero, the indirect effect is statistically significant. Staff Competency significantly mediates the relationship between Digital Technology and Financial Institution Sustainability. In other words, digital technology improves staff competency, which in turn enhances sustainability. Full Mediation is suggested because the direct effect of DGT on FIS is not significant, while the indirect effect via Staff Competency is significant. This means the impact of digital technology on sustainability is transmitted entirely through staff competency. Prioritize staff development and competency building when implementing digital technologies. Recognize that digital tools alone do not guarantee sustainability unless personnel are capable and skilled in utilizing them effectively. Invest in training and support systems that ensure employees can translate digital advancements into sustainable practices. Staff competency fully mediates the effect of digital technology on financial

institution sustainability. While digital tools by themselves may not directly drive sustainability, their true value is realized when staff are competent enough to implement and maximize their utility.

Table 4.9 Hypothesis Testing and Findings

Hypothesis	Relationship	Beta value	T value	P value	Decision
H1	DTG - -> FIS	.060	.232	3.900	Supported
H2	DTG - -> SCT	.042	.697	15.903	Supported
H3	SCT - -> FIS	.054	.470	8.713	Supported
H4	TRG*DTG - -> SCT	.0403	6.1382	.0000	Supported
H5	SCT- -> DTG - -> FIS	.0628	9.2857	.0000	Supported

4.7 Discussion of Results

Positive Effect of Digital Technology on Financial Institution Sustainability: Digital technology (DGT) plays a vital role in enhancing the sustainability of financial institutions by increasing operational efficiency, reducing transaction costs, and enabling strategic innovation. Technologies such as mobile banking, blockchain, and artificial intelligence streamline processes, improve customer experience, and reduce environmental impact by minimizing paper use and travel requirements (Dwivedi et al., 2021). Furthermore, DGT supports financial inclusion by extending services to underserved populations, thereby contributing to socio-economic sustainability (Khan et al., 2022). These improvements align with the principles of sustainability by enhancing economic performance, environmental stewardship, and social responsibility in financial services (Chakraborty & Biswas, 2020). Therefore, embracing digital transformation is crucial for financial institutions aiming for long-term viability.

Positive Effect of Digital Technology on Staff Competency: The findings reveal a strong and statistically significant relationship between digital technology and staff competency, confirming that digital tools positively influence employee capabilities. Digital technologies such as learning management systems, AI-driven support tools, and cloud-based collaboration platforms enhance the speed and quality of knowledge acquisition, enabling employees to adapt more efficiently to changing environments (Zhou et al., 2021). As staff interact with modern tools, they develop critical digital literacy, technical skills, and innovative thinking, which contribute to improved decision-making and service delivery (Agwu & Murray, 2022). Moreover, technology-driven workplaces often encourage continuous learning and self-development, fostering a more competent and agile workforce (Alshahrani & Ally, 2020). Consequently, digital transformation not only modernises infrastructure but also empowers human capital, which is a critical success factor in the digital age.

Positive Effect of Staff Competency on Financial Institution Sustainability: Staff competency significantly contributes to financial institution sustainability, as evidenced. Competent employees drive innovation, improve service delivery, and maintain regulatory compliance, all of which are pillars of institutional sustainability (Chigada & Madzinga, 2020). When employees possess the necessary knowledge and skills, they are better equipped to use resources efficiently, manage risks, and implement environmentally and socially responsible practices (Mousa & Othman, 2020). This capability also enhances institutional adaptability, enabling quick responses to external changes such as market shifts or technological disruption (Chen et al., 2021). Furthermore, well-trained staff foster stronger customer relationships and trust, which are crucial for sustainable financial operations (Nuseir, 2022). Therefore, strengthening human capital is indispensable for institutions seeking to achieve enduring economic and social performance.

Positive Moderating Effect of Training Programs on the Relationship Between Digital Technology and Staff Competency: The findings show that training programs significantly

moderate the relationship between digital technology and staff competency, suggesting that the effectiveness of digital tools in enhancing staff skills depends on the availability of relevant training. Training provides employees with the necessary knowledge to effectively navigate and leverage technological tools, thereby amplifying the competency gains from digital adoption (Boateng et al., 2023). Without adequate training, the potential of digital tools can be underutilized due to lack of user proficiency or resistance to change (Alam & Uddin, 2021). Furthermore, continuous learning initiatives empower employees to keep pace with rapid technological advancements, fostering a culture of adaptability and innovation (Obeidat et al., 2020). Thus, training serves as a critical enabler that strengthens the bond between digital technology and staff effectiveness, making it an essential component of digital transformation strategies.

Positive Mediating Effect of Staff Competency on the Relationship Between Digital Technology and Financial Institution Sustainability: The findings of the study indicate that staff competency significantly mediates the relationship between digital technology and financial institution sustainability. The direct effect of digital technology on sustainability becomes statistically insignificant when staff competency is included in the model, while the indirect effect through staff competency is significant. This finding suggests full mediation, indicating that the impact of digital technology on sustainability is realized through enhanced staff capabilities. This aligns with recent studies that highlight human capital as a crucial conduit through which digital transformation achieves sustainable outcomes (Aboelmaged, 2021; Kim & Park, 2022). When employees are digitally literate and skilled, they can exploit technological tools more effectively, resulting in better resource management, innovation, and service quality (Ojo et al., 2020). Hence, institutions must not only invest in technology but also in staff development to unlock the full sustainability benefits of digital innovations.

5.0 MANAGERIAL IMPLICATIONS

Managers should view digital transformation not just as a technological shift, but as an enabler of holistic sustainability. This means setting integrated goals that balance financial performance with environmental stewardship and social responsibility, ensuring that all digital initiatives contribute meaningfully to long-term value creation. The significant relationship between digital technology and institutional sustainability suggests that managers should invest strategically in digital tools such as AI-driven analytics, mobile platforms, and blockchain to streamline operations, reduce costs, and promote eco-friendly practices. These technologies not only enhance operational efficiency but also contribute to the economic, environmental, and social goals of sustainability.

The strong link between digital technology and staff competency indicates that digital adoption alone is not enough. Managers must ensure that employees are digitally literate, adaptable, and well-equipped to engage with new technologies. This requires embedding digital competency into talent development frameworks and performance evaluations. The finding that staff competency positively influences financial institution sustainability reinforces the importance of skilled human capital. Managers should foster a culture of learning and innovation, where knowledgeable employees can lead compliance efforts, mitigate risks, and drive customer-centric innovations that ensure long-term sustainability. Since training programs positively moderate the relationship between digital technology and staff competency, managers must prioritize ongoing training tailored to emerging technologies. This reduces resistance, boosts confidence in technology use, and ensures that digital tools are integrated effectively into daily operations.

5.1 Theoretical Contribution

The research extends existing theories that link technological advancement with sustainable development by empirically validating the positive effect of digital technology on

financial institution sustainability. By demonstrating alignment with the triple bottom line (economic, environmental, and social dimensions), the study contributes to sustainability literature by highlighting how digital transformation acts as a strategic enabler of holistic institutional sustainability. By identifying training programs as a significant moderator in the relationship between digital technology and staff competency, the study contributes a nuanced understanding of how contextual and organizational factors shape technology assimilation. This finding enhances theoretical models of technology acceptance and adoption by incorporating learning support as a key enabler.

The finding that staff competency fully mediates the relationship between digital technology and sustainability adds theoretical depth to models of indirect influence. It suggests that digital technology affects organizational outcomes not directly, but through a human-centered pathway—staff competency. This insight informs future theoretical frameworks that explore how and why digital strategies impact organizational performance. Situated within the financial sector, the study adds contextual specificity to broader theories of digital transformation and sustainability. It demonstrates that in heavily regulated, service-oriented industries like finance, the human element is vital in leveraging digital tools for strategic outcomes.

5.2 Recommendations

Financial institutions should prioritize the deployment of advanced digital technologies such as artificial intelligence, machine learning, cloud computing, and mobile banking platforms. These tools can streamline operations, reduce costs, and support environmentally responsible practices, thereby advancing institutional sustainability. However, digitalization strategies should be aligned with long-term sustainability goals. Management should foster a culture of lifelong learning by encouraging employees to engage with digital tools and platforms regularly. Initiatives such as digital upskilling programs, certifications, and knowledge-sharing sessions can improve staff competency, adaptability, and innovation capacity—key drivers of organizational success in the digital era.

Since training programs have a moderating effect on the relationship between digital technology and staff competency, institutions should adopt structured, needs-based training frameworks. Training should be tailored to specific technological tools and designed to reduce resistance, boost confidence, and improve efficiency in using digital systems. Given the mediating role of staff competency, digital transformation should not be viewed purely as a technical upgrade but as a people-centered initiative. Institutions should invest in human capital development, including leadership training, cross-functional digital teams, and mentorship programs to harness the full potential of technological investments. Financial institutions should create an enabling environment that encourages innovation, experimentation, and the safe adoption of new technologies. This includes flexible policies, recognition and rewards for innovation, and the use of digital sandboxes for piloting new ideas without regulatory risks.

5.3 Limitations and Suggestions for Future Study

This study adopted a cross-sectional research design, capturing data at a single point in time. While this approach is effective for identifying relationships among variables, it limits the ability to infer causality or observe changes over time in the effects of digital technology and staff competency on financial institution sustainability. The research focused on Accra as a geographic region and the set of financial institutions that operating in Accra, potentially limiting the generalizability of the findings. Different regions or types of financial institutions may experience varying impacts of digital technology due to differing regulatory environments, technological readiness, and organizational cultures. Future research should consider longitudinal studies to examine how the effects of digital technology, staff competency, and training programs evolve over time. This would provide deeper insights into causality and

sustainability trajectories. Researchers should broaden the scope of the study to include financial institutions across different countries, regions, or sectors to validate and generalize the findings across diverse institutional contexts. Future studies could integrate qualitative methods such as interviews or focus groups to explore the contextual dynamics behind the quantitative results. This would help uncover deeper insights into how digital tools and staff development practices are implemented and perceived.

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