

DIGITAL RESILIENCE IN TEACHER EDUCATION: THE ROLE OF SCHOOL LEADERSHIP IN STRENGTHENING WORK-INTEGRATED LEARNING ACROSS CONTEXTS

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Abstract

Digital transformation has emerged as a significant challenge for educational institutions worldwide, particularly in contexts marked by increasing inequality and recurring crises. This study examines how institutional digital resilience is shaped by leadership practices, professional learning cultures, and policy environments in schools and teacher education programs. Guided by an interpretivist paradigm, the research employs a comparative qualitative case study design, analyzing institutional documents and annual reports from two contrasting educational contexts to explore how digital strategies are conceptualized, implemented, and sustained.

The findings identify several factors that strengthen institutional digital resilience. First, distributed leadership fosters shared responsibility for digital transformation across multiple organizational levels, promoting collaboration and collective ownership. Second, communities of practice provide essential structures for peer learning and the development of collective digital competence. Third, a clear leadership vision translates policy into practice by aligning institutional strategies with teaching and learning. Fourth, crises serve as both catalysts for digital innovation and sources of persistent digital inequities, highlighting the need for equitable and sustainable approaches. Finally, policy coherence across institutional, school, and national levels enhances preparedness by supporting consistent, long-term digital practices.

This study contributes to the growing scholarship on digital resilience by demonstrating how leadership, collaboration, and policy interact to strengthen institutional capacity for digital transformation. The findings suggest that resilient digital ecosystems depend not only on technological investment but also on enabling leadership, supportive professional learning communities, and coherent policies that prioritize equity and sustainability. Implications include strengthening leadership development, expanding capacity-building initiatives, and conducting comparative research across diverse educational systems.

Keywords: digital resilience, work-integrated learning, school leadership, teacher education, distributed leadership, comparative education

Teacher education programs across the globe are experiencing remarkable and unprecedented changes resulting from global crises, including the COVID-19 pandemic, economic downturns, and the rapidly evolving nature of technology (Arendse et al., 2024; Goodwin, Madalińska-Michalak, & Flores, 2023; Rwodzi & De Jager, 2021). These changes have underscored the importance of developing digital resilience, which refers to the ability to adapt and sustain learning through digital platforms under a variety of circumstances (Boh et al., 2023; Sun et al., 2022). Within teacher education, concerns have also emerged regarding the vulnerability of Work-Integrated Learning (WIL), as this component depends heavily on collaboration and interaction between universities and partner schools (Aprile & Knight, 2020; Cooper et al., 2010; Gamage, 2022). These emerging vulnerabilities highlight a critical gap in understanding how teacher education systems can develop the digital resilience necessary to sustain WIL in rapidly changing educational environments.

For institutions to navigate challenging periods successfully, digital resilience in teacher education enables teacher educators, pre-service teachers, and partner schools to provide teaching and learning through flexible, technology-enhanced approaches. This approach allows educators to adapt their instructional strategies and learning platforms to sustain Work-Integrated Learning (WIL), even when traditional teaching placements are disrupted (Rwodzi & De Jager, 2021). Research has shown that teachers who possess digital resilience are better equipped to deliver effective instruction during crises, such as the COVID-19 pandemic, and to develop innovative solutions in response to challenging circumstances (Eri et al., 2021; Nyathi & Joseph, 2024). This paper examines leadership practices that enhance digital resilience in WIL across two distinct learning contexts.

Based on prevailing concerns regarding how teacher education programs are coping with and responding to digital disruption, this paper examines the role of school leaders in enhancing the digital resilience of pre-service teachers through Work-Integrated Learning (WIL). It also analyzes the similarities and differences in the strategies implemented by school leaders in South Africa and the United States to promote digital resilience among pre-service teachers. By presenting a comparative perspective, the paper highlights points of convergence and divergence across these two educational contexts. Ultimately, the study identifies strategies employed by school leaders that can strengthen the digital resilience of pre-service teachers participating in WIL across diverse educational settings.

THEORETICAL FRAMEWORK

This paper is grounded in the **Community of Practice (CoP)** framework and **Distributed Leadership Theory**. These complementary theoretical perspectives provide the foundation for examining the role of school leaders in fostering the digital resilience of pre-service teachers through Work-Integrated Learning (WIL). The relevance and application of each framework are discussed throughout the paper to demonstrate how they inform the study's analysis and interpretation of the findings.

Community of Practice Theory

Community of Practice (CoP) Theory provides a foundation for understanding the development of pre-service teachers' digital competence and professional identity within Work-Integrated

Learning (WIL) contexts. The theory serves as a framework for examining learning development and identity formation within the collaborative social environment that characterizes WIL. According to Wenger (1998), a community of practice develops through shared practice, mutual engagement, and the creation of a shared repertoire of resources, tools, and practices. These collaborative learning experiences are essential to the professional growth of pre-service teachers, who draw upon the expertise of mentor teachers, school leaders, and other educational professionals to develop and demonstrate effective digital teaching practices.

The application of CoP Theory has been widely examined in research on digital learning and teaching practices (Garrison et al., 2010; Wenger-Trayner & Wenger-Trayner, 2020). The theory provides a valuable lens for exploring how digital readiness is co-constructed through collaboration, shared participation, and authentic learning experiences during teaching practice. In the context of digital resilience, CoP Theory conceptualizes the development of pre-service teachers' competencies through participation in professional learning communities and collaborative networks within educational settings in both the United States and South Africa. The present study employs Community of Practice Theory to explain how pre-service teachers develop digital readiness through active participation in supportive learning environments where digital knowledge, skills, and instructional practices are collaboratively shared and refined. This theoretical framework directly informs Research Question 1, which examines how leadership practices within Work-Integrated Learning influence the digital readiness of pre-service teachers.

Distributed Leadership Theory

Distributed Leadership Theory supports and complements the Community of Practice (CoP) Theory by emphasizing that leadership for digital resilience is enacted through collective processes within school systems. As a complementary theoretical perspective, Distributed Leadership Theory provides an additional lens for understanding how leadership practices foster digital resilience across educational ecosystems. Based on the work of Spillane (2006), leadership is conceptualized as a distributed practice in which expertise, decision-making, and responsibility are shared among multiple individuals rather than residing with a single leader.

This perspective aligns with the view that digital resilience and the successful digital transformation of teaching and learning cannot be achieved through isolated efforts but instead require collaborative processes that address the challenges associated with technological innovation and change (Harris, 2014; Harris & Spillane, 2008).

Within the work-integrated learning (WIL) context, Distributed Leadership Theory underscores the importance of collaborative actions among school principals, information and communication technology (ICT) coordinators, mentor teachers, teacher educators, university administrators, and other educational stakeholders in preparing preservice teachers with the digital competencies needed for professional practice. Leadership during periods of technological disruption highlights the necessity of shared responsibility, collaborative decision-making, and organizational adaptability to sustain effective teaching and learning environments (Fullan, 2021; Spillane et al., 2020). The integration of Community of Practice Theory and Distributed Leadership Theory emphasizes the interconnected social and organizational dimensions that contribute to the development of digital resilience in teacher education.

Distributed Leadership Theory is aligned with Research Question 2 because it examines the similarities and differences in leadership practices that support digital resilience within learning environments in South Africa and the United States. The theory provides a framework for comparing how leadership structures, collaborative processes, and shared responsibilities differ across the two countries while influencing the development of digital resilience among preservice teachers.

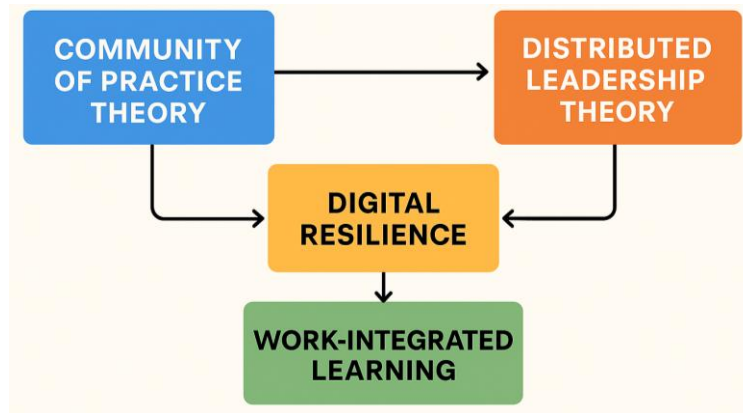
Integrating the Frameworks

The Community of Practice (CoP) and Distributed Leadership frameworks are integrated through the concept of digital resilience, as both emphasize the importance of resilience as a collaborative and collective process. The CoP framework highlights the development of resilience through active participation in supportive professional communities, where knowledge, skills, and experiences are shared among members (Wenger, 1998). In contrast, Distributed Leadership Theory emphasizes the role of shared leadership structures in enabling schools to respond effectively and adaptively to digital challenges by distributing expertise and decision-making across multiple stakeholders (Spillane, 2006). Together, these frameworks provide complementary perspectives for understanding how digital resilience is developed and sustained within teacher education and work-integrated learning (WIL) environments.

Research Question 3 draws upon both theoretical frameworks and the digital resilience literature to investigate the strategies that strengthen collective digital resilience in WIL settings. Digital resilience refers to the capacity of individuals and institutions to adapt, recover, and continue learning effectively in response to digital disruptions and technological challenges (Sun et al., 2022; Weller & Anderson, 2013; Wright, 2016). For pre-service teachers, digital resilience encompasses the confidence, knowledge, and adaptive capacity to effectively use a range of digital technologies while navigating uncertainty and responding to disruptions such as power outages, pandemics, connectivity issues, and learning platform failures (Livingstone, 2018). Developing digital resilience therefore requires intentional leadership practices, equitable access to technology, ongoing professional learning, and flexible institutional structures that support adaptation and innovation.

By integrating social learning processes, shared leadership practices, and the principles of digital resilience, this conceptual framework provides a comprehensive foundation for examining how leadership influences the digital experiences of pre-service teachers during WIL across diverse educational contexts. The integration of these perspectives recognizes that digital resilience is not solely an individual competency but also an organizational capability that emerges through collaboration, shared expertise, and supportive leadership practices. Figure 1 illustrates the relationship and interconnectedness among the theoretical frameworks and the concept of digital resilience that underpins this study.

Figure 1
Conceptual Diagram



The conceptual diagram in Figure 1 shows the role that CoP Theory and Distributed Leadership Theory complementarily play, together with Digital Resilience, in informing and developing an optimal WIL experience. CoP Theory has a practice in making a structure for collaboration and learning processes for participants as students. Lave and Wenger (1991), explains the CoP theory follows a phenomenon that describes how members, within a certain community, learn by developing as they practice. Spillane (2006); Harris (2013), argue that Distributed Leadership Theory supports skills within an organizational structure as members are capable of sharing skills. Thus, these two theories; Distributed Leadership Theory, together with CoP Theory, supports organizational digital resilience with regard to peer collaboration, problem-solving, and responsibility in dealing with technological changes (Panadero et al. 2023). It is therefore important to note that, according to the CoP Theory, learning within an organization occurs through collaborative knowledge-sharing structures. In contrast, Distributed Leadership Theory promotes an organizational framework characterized by shared responsibility and supportive interactions, thereby contributing to the development and expansion of leadership capacity throughout the organization.

METHODOLOGY

This study is situated within the interpretivist paradigm, which assumes that reality is socially constructed through the meaning's individuals attribute to their experiences. This paradigm is appropriate for the current study because it emphasizes understanding how educational institutions conceptualize and implement digital transformation within their unique sociocultural contexts (Schwandt, 1994; Willis, 2007). Rather than seeking objective or universal truths, interpretivist research focuses on exploring participants' perspectives, beliefs, and lived experiences.

According to Merriam (2009), interpretive research seeks to understand the meanings that participants assign to their experiences, assumptions, and practices within their natural settings. Consistent with this perspective, the interpretivist paradigm provides the analytical lens through which this study examines how institutional stakeholders perceive and enact leadership strategies, allocate resources, and foster digital resilience within work-integrated learning (WIL)

environments. This approach enables a deeper understanding of the complex social processes that influence digital transformation in teacher education.

Comparative Qualitative Case Study Design

This study employs a comparative qualitative case study design to facilitate an in-depth investigation of the contextual complexities and richness of two educational institutions. Case study research is particularly appropriate for examining complex organizational phenomena in which the boundaries between the phenomenon being studied and its contextual environment are not clearly delineated (Yin, 2018). A comparative case study approach strengthens the analytical depth of the research by enabling systematic examination of similarities, differences, and contextual factors across cases (Goodrick, 2014).

Through this design, the study explores how each institution's governance structures, historical development, and strategic priorities interact to shape their approaches to digital transformation and the cultivation of digital resilience. This approach allows for a nuanced understanding of how institutional contexts influence the adoption, implementation, and sustainability of digital practices within educational settings.

Locale of the Research Site

The digital contexts of Mangaung, South Africa, and Houston, United States of America, reflect distinct socioeconomic and infrastructural environments that influence the digital readiness of pre-service teachers within work-integrated learning (WIL) contexts. These differing environments provide an important comparative foundation for examining how institutional conditions shape access to digital resources, technology integration, and digital resilience in teacher preparation.

Digital Context of the Research Sites

The Mangaung digital environment is characterized by limited technological infrastructure, with variations in internet connectivity across schools that influence the consistency of work-integrated learning (WIL) experiences for pre-service teachers. Although internet penetration in South Africa has increased, with approximately 74.7% of the population having internet access in 2024, the availability, reliability, and quality of connectivity remain unevenly distributed. Many communities continue to rely heavily on cellular networks due to limited access to stable broadband infrastructure (DataReportal, 2024; Statistics South Africa [Stats SA], 2024). At the provincial level, the Free State has made progress in expanding digital connectivity; however, these improvements remain limited to a subset of schools targeted through recent connectivity initiatives (Free State Province, 2023).

Research within the Mangaung context has also identified persistent challenges related to access to digital devices and teachers' capacity to effectively integrate information and communication technologies (ICTs) into teaching and learning practices. These limitations require mentor teachers and pre-service teachers to rely on collaborative networks and supportive peers to complete digitally mediated tasks associated with the WIL process (Stats SA, 2024). Consequently, digital engagement within the Mangaung educational context remains influenced by institutional capacity, teacher digital competence, and the availability of external support structures.

In contrast, the Houston educational context reflects a comparatively advanced digital environment characterized by stronger technological infrastructure, greater institutional investment, and broader access to digital learning platforms. However, digital equity challenges continue to exist within the district and surrounding communities. Nationally, most school districts in the United States have achieved the minimum connectivity standards established by the Federal Communications Commission (FCC), with approximately 74% of districts meeting the benchmark of one megabit per second per student in 2023 (Connect K12, 2023). These developments have contributed to a more stable technological foundation for in-school access and digital learning opportunities.

Despite this progress, digital inequities remain evident in Houston, particularly among economically disadvantaged households. A post-pandemic survey conducted within the Houston area identified continued disparities in home-based digital access, with many low-income families experiencing challenges obtaining reliable internet connectivity and computers necessary for students to complete academic work. Additionally, a significant number of teachers reported that some students lacked access to functional digital devices outside of school settings (Kinder Institute, 2022).

The comparison of these two contexts suggests that while Houston benefits from stronger institutional infrastructure, learning management system (LMS) availability, and district-supported digital initiatives, challenges related to equitable access beyond the school environment remain unresolved. Similarly, Mangaung faces more foundational challenges involving infrastructure, connectivity, and digital capacity. These contextual differences are significant for understanding how pre-service teachers experience and develop digital resilience during WIL placements. The availability of technological resources, institutional support, and opportunities for digital engagement collectively shape the extent to which pre-service teachers can participate effectively in digitally mediated teaching and learning practices.

The comparative digital landscapes of Mangaung and Houston highlight how socioeconomic contexts, infrastructure availability, and institutional leadership influence the digital readiness of pre-service teachers within work-integrated learning (WIL) environments. While Houston benefits from a more mature digital ecosystem supported by established district initiatives, structured digital leadership practices, and greater access to learning technologies, Mangaung continues to encounter challenges related to inconsistent connectivity, limited availability of digital devices, and variations in teachers' digital competencies.

These contrasting contexts demonstrate that the central issue extends beyond technological access alone and involves the development of equitable digital infrastructure, effective leadership practices, and collaborative systems that support meaningful WIL experiences. Enhancing digital readiness in both settings, although from different points of departure, requires context-specific investments, sustained professional capacity building, and the strengthening of Communities of Practice (CoPs). Such collaborative structures can support pre-service teachers' engagement with digitally mediated teaching and learning practices while promoting greater equity, resilience, and preparedness across diverse educational environments.

Data Sources and Selection Criteria

The primary data source for this study is document analysis, which Bowen (2009) describes as “a systematic procedure for reviewing or evaluating documents” to generate insights into organizational intentions, priorities, and practices. Document analysis is particularly appropriate for studies examining institutional policies, strategic planning, and organizational practices because documents represent formal expressions of institutional commitments, priorities, and narratives. This study analyzes three categories of documents: policy documents, strategic plans, and institutional reports. These sources serve as key comparative data sets for examining how digital resilience within work-integrated learning (WIL) contexts is conceptualized and enacted through leadership practices across South African and United States teacher education environments.

Purposive sampling was used to select relevant documents at global, national, and institutional levels within both South Africa and the United States. The selection criteria focused on documents that provided insight into teacher education policies, digital transformation initiatives, leadership practices, and institutional responses to technological change. Policy documents examined in this study included the *Minimum Requirements for Teacher Education Qualifications* (MRTEQ) in South Africa and the standards and requirements established by the Council for the Accreditation of Educator Preparation (CAEP) in the United States. These documents were selected because they provide regulatory and professional frameworks that shape expectations for teacher preparation and institutional accountability.

Strategic plans were selected based on their relevance to digital resilience, institutional transformation, and leadership priorities over time. These documents were considered important sources for understanding how educational institutions articulate strategic responses to technological change, resource allocation, and digital readiness. Institutional reports provided additional evidence regarding how strategic intentions related to digital transformation and WIL implementation were operationalized within teacher education programs. These reports included WIL reports, institutional self-evaluation reports, and other relevant organizational documents that demonstrated institutional practices and responses to emerging challenges.

The selected documents also supported methodological triangulation by enabling comparison between stated institutional intentions, strategic priorities, and evidence of implementation. Through the analysis of multiple document types across two national contexts, the study sought to develop a comprehensive understanding of how leadership structures, institutional strategies, and collaborative practices contribute to the development of digital resilience in WIL environments.

Data Analysis

The document analysis process was guided by two primary analytical focus: (a) leadership strategies and frameworks and (b) digital infrastructure and resource deployment. The first analytical focus examined how leadership articulates priorities related to digital transformation through governance structures, strategic planning models, and capacity-building initiatives. Attention was given to the principles commonly associated with effective digital transformation leadership, including distributed decision-making, strategic visioning, collaborative leadership practices, and the alignment of institutional resources with digital priorities.

The second analytical focus examined the role of digital infrastructure and resource deployment in shaping institutional capacity for digital transformation. This included analysis of institutional investments in information and communication technology (ICT) infrastructure, learning management systems, connectivity, digital platforms, and support structures. Existing research suggests that robust digital ecosystems provide the foundation necessary for fostering pedagogical innovation, institutional adaptability, and digital resilience within educational contexts (Jeladze & Pata, 2018; Marchese et al., 2025; Tondeur et al., 2017).

Together, these analytical foci enabled a comprehensive examination of how leadership intentions and material conditions interact to influence digital transformation within teacher education. By analyzing both leadership frameworks and digital infrastructure, the study moved beyond policy rhetoric to investigate the extent to which strategic visions are translated into sustainable, context-responsive practices. This analytical approach supported an examination of how institutions develop the conditions necessary to promote pedagogical innovation, digital resilience, and effective work-integrated learning (WIL) experiences across diverse educational environments.

Drawing on Distributed Leadership Theory, this study employed an analytical approach that examined how responsibility for digital learning initiatives and work-integrated learning (WIL) support is distributed among various leadership actors within educational institutions. In addition, Communities of Practice (CoP) Theory informed the analysis by providing a lens for understanding how pre-service teachers develop professional identities and become legitimate participants in digitally enabled teaching and learning practices.

Data were analyzed using NVivo qualitative data analysis software, which enhanced analytical rigor through systematic coding, categorization, and identification of emerging themes. Following the coding process, cross-case synthesis was conducted to compare patterns, similarities, and differences in leadership practices and institutional responses across the two contexts. This comparative analytical approach enabled a deeper understanding of how distributed leadership practices, collaborative learning structures, and contextual conditions influence the development of digital resilience within WIL environments.

Ethical Considerations

Approval was obtained from the relevant institutional ethics committee prior to the commencement of data collection. Because this study relied on publicly available policy documents, strategic plans, and institution-level reports, there was no direct engagement with human participants. The documents were analyzed objectively and ethically, with care taken to avoid making evaluative judgments about specific institutions, individuals, or leadership teams. Findings were presented at a broader institutional and contextual level to maintain analytical neutrality and respect for the organizations represented in the study.

Attention was given to ethical considerations associated with cross-contextual comparison. The analysis sought to avoid deficit-based interpretations, particularly when examining differences in technological infrastructure, socioeconomic conditions, and policy environments between South Africa and the United States. Instead, the study approached each context as a unique educational ecosystem shaped by historical, institutional, and structural factors. This approach supported a

balanced interpretation of how leadership practices, digital resources, and collaborative structures contribute to digital resilience and work-integrated learning (WIL) experiences across diverse educational settings.

FINDINGS

Analysis of policy documents, strategic plans, and institutional reports revealed how digital resilience in Work-Integrated Learning (WIL) is constructed, enabled, and constrained through leadership practices across South African and United States contexts. Four interrelated themes emerged from the cross-document and cross-context analysis.

1. Leadership Framing of Digital Transformation in Work-Integrated Learning

Across both the South African and United States contexts, national and institutional policy documents positioned digital transformation as a strategic priority, although they differed in the extent to which they explicitly addressed Work-Integrated Learning (WIL) and the preparation of pre-service teachers. In the South African policy documents, digitalization was primarily framed as a long-term systemic objective, with limited reference to how digital technologies should be enacted during WIL placements in schools. For example, the Department of Education (2004) stated that “*All pre-service teacher training in higher education institutions includes basic ICT literacy and basic ICT integration into teaching and learning*” (p. xx). While this policy emphasizes the importance of developing foundational digital competencies, it does not provide explicit guidance or structured opportunities for pre-service teachers to apply digital technologies during their WIL experiences.

In contrast, strategic plans and accreditation-related documents from the United States more explicitly connected digital learning with clinical practice and professional preparation. One institutional strategic plan emphasized the need to “*train and build faculty capacity to expand the utilization of technology to reach millennial generation students*” (University Strategic Plan, USA, p. xx). This framing positioned digital competence as an integral component of teacher preparation rather than an additional skill, highlighting the expectation that technology integration should be embedded throughout WIL experiences.

The cross-context analysis suggests that leadership framing plays a significant role in shaping how digital resilience is conceptualized and enacted within teacher education. While both countries recognize the importance of digital transformation, the United States policy documents provide clearer strategic direction for integrating technology into WIL practices. Conversely, South African policies establish a strong commitment to digital literacy but provide less explicit guidance on how institutional leaders, mentor teachers, and pre-service teachers should collaboratively implement digital practices during school-based learning. These findings indicate that effective leadership for digital resilience requires not only policy commitment but also practical frameworks that support the integration of digital technologies into authentic WIL contexts.

2. Distributed Leadership and Responsibility for Digital Support

Leadership responsibilities for digital learning during WIL were unevenly articulated across documents. School leadership standards in both contexts recognised the role of principals in

enabling teaching and learning; however, responsibility for digital mentoring of pre-service teachers was often implied rather than explicitly assigned. A South African institutional report noted that *“support for student teachers’ use of digital tools varied significantly across placement schools, depending on local leadership priorities and available expertise”* (Teaching Practice Report, SA).

In contrast, several U.S. institutional and district-level documents reflected a more distributed leadership approach. One report described how *“mentor teachers, instructional coaches, and school leaders collaboratively support teacher candidates’ integration of digital tools during practicum”* (College of Education Annual Report, USA). This suggests a clearer distribution of leadership roles across actors, aligning with a distributed leadership model that supports digital resilience through shared responsibility.

3. Positioning of Pre-Service Teachers within Communities of Practice

The extent to which pre-service teachers were positioned as legitimate participants in digitally mediated communities of practice differed across contexts and document types. In South African policy texts, pre-service teachers were often referred to generically as “student teachers” within WIL, with limited attention to their participation in digital practices. One institutional report reflected that *“student teachers largely adapted to existing school practices, including available technologies, rather than actively shaping digital teaching approaches”* (WIL Evaluation Report, SA).

Conversely, several U.S.-based documents explicitly positioned pre-service teachers as active contributors. A practicum handbook stated that *“teacher candidates are expected to engage fully in the school’s digital learning environment, including learning management systems, assessment platforms, and online communication tools”* (Practicum Handbook, USA). This language reflects a stronger alignment with Communities of Practice theory, where participation, access, and legitimacy are central to learning.

4. Digital Resilience, Crisis Response, and Continuity of Work-Integrated Learning

Policy documents and institutional reports across both contexts highlighted how digital resilience was challenged and reconfigured during periods of crisis and educational disruption. The findings demonstrate that the continuity of Work-Integrated Learning (WIL) depended not only on access to digital technologies but also on leadership capacity, institutional preparedness, and the effectiveness of policy implementation.

In the South African context, institutional reports revealed considerable variability in schools’ capacity to sustain WIL through digital modalities during periods of disruption. One faculty report observed that *“the continuation of teaching practice during periods of disruption depended largely on individual schools’ access to devices, connectivity, and leadership support”* (Faculty Teaching and Learning Report, South Africa, p. xx). This finding suggests that digital resilience was unevenly distributed across institutions and schools, reflecting disparities in technological infrastructure, digital resources, and leadership support. Consequently, pre-service teachers experienced varying levels of access to meaningful WIL opportunities, depending on the capacity of their placement schools to adapt to changing circumstances.

By comparison, institutional documents from the United States reflected more formalized approaches to ensuring continuity during crises. A district-level report stated that “*established digital platforms and leadership protocols enabled teacher candidates to continue clinical practice through hybrid and remote models*” (District Continuity Report, USA, p. xx). These documents indicate that institutional leaders had implemented structured contingency plans, supported by established digital systems and coordinated leadership practices, to minimize disruptions to teacher preparation.

The cross-context analysis demonstrates that digital resilience extends beyond the availability of technological infrastructure. Instead, it emerges through the interaction of strategic leadership, coherent institutional policies, organizational preparedness, and collaborative learning practices. Institutions with clearly defined leadership structures and established digital continuity plans were better positioned to sustain WIL during periods of disruption, whereas institutions with limited infrastructure and less coordinated leadership encountered greater challenges in maintaining quality clinical experiences. These findings underscore the importance of leadership in fostering digital resilience by developing adaptive systems, promoting institutional learning, and ensuring that pre-service teachers can continue meaningful professional practice despite changing educational conditions.

Summary of Findings

The findings of this study demonstrate that digital resilience in Work-Integrated Learning (WIL) is shaped by the distribution of leadership responsibilities, the positioning of pre-service teachers within digital communities of practice, and the extent to which policy intentions are translated into institutional practice. Across both the South African and United States contexts, policy documents consistently identified digital transformation as a strategic priority for teacher education. However, notable differences emerged in the ways leadership was enacted, the clarity of leadership roles and responsibilities, and the degree to which digital technologies were intentionally integrated into WIL experiences.

The analysis further revealed that leadership practices influenced the development of digital resilience by shaping institutional preparedness, collaboration among stakeholders, and the continuity of learning during periods of disruption. Institutions that articulated clear leadership structures, supported collaborative decision-making, and implemented coordinated digital strategies were better positioned to sustain meaningful WIL experiences. In contrast, contexts where leadership expectations and implementation strategies were less explicit experienced greater variability in the integration of digital technologies and the continuity of professional practice.

Overall, these findings highlight the importance of leadership-informed approaches to digital resilience in teacher education. They suggest that strengthening digital resilience requires not only strategic policy commitments but also coherent institutional leadership, collaborative professional learning, and the effective integration of digital technologies into WIL. These findings provide the foundation for the discussion presented in the next chapter, where the results are interpreted in relation to the study's conceptual framework, existing literature, and implications for policy and practice.

IMPLICATIONS AND RECOMMENDATIONS

Implications for Policy and Practice

The main implications of this study for policy development and institutional practice in the strengthening of digital resilience are manifold. These relate to the structural, leadership, and cultural conditions that underpin the sustainable digital transformation of educational institutions.

Enhancing Distributed and Strategic Leadership Capacity

The findings indicate that the centrality of distributed leadership requires policies and institutional strategies to prioritize the development of leadership capacity across multiple levels of the organization rather than concentrating responsibility for digital transformation solely within senior leadership positions. Strengthening leadership capacity at all organizational levels enables institutions to respond more effectively to technological change, fosters collaborative decision-making, and enhances the sustainability of digital initiatives.

Professional development programs should therefore extend beyond technical digital competencies to include the knowledge, skills, and practices associated with digital leadership. Such programs should promote collaboration across academic and administrative units, encourage shared responsibility for digital innovation, and empower middle leaders to initiate and implement contextually appropriate technological improvements. By cultivating leadership expertise throughout the institution, organizations can strengthen their capacity to adapt to emerging digital challenges while promoting collective ownership of transformation initiatives.

At the policy level, educational authorities should reinforce these institutional efforts by embedding expectations for distributed leadership within information and communication technology (ICT) and digital transformation policy frameworks. Clearly articulated leadership responsibilities at departmental, faculty, and institutional levels can promote consistency in implementation, strengthen accountability, and facilitate coordinated decision-making. Integrating distributed leadership principles into policy frameworks can therefore support coherent and sustainable digital transformation while enhancing institutional digital resilience.

Embedding Communities of Practice in Institutional Professional Learning Models

This involves a call to formally embed the structures of collaborative professional learning within the staff development models of institutions and to make time, resources, and digital platforms available to facilitate teachers sharing tools, exchanging pedagogical strategies, and reflecting on practice. Institutional policies should position CoPs as one of the core professional learning mechanisms and provide ongoing support, facilitation, and recognition for these networks. This is a part of investing in long-term organizational capacity, as well as a culture of learning.

Remedying Digital Inequalities through Strategic, Long-Term Investment

The revelation of a lack of digital equities within a crisis brings with it the need for, and emphasis on, deliberate, non-crisis-oriented investment in digital space. Equity in accessing devices, internet, and developing the necessary digital skills for both staff and students would need to become a priority at an institutional level. The needs of such policies ought to include a set of provisions that make it possible to support the distribution of resources to underserved

departments, campuses, or communities. The digital equity situation within a country might also need improvement regarding supporting universal access, subsidized data initiatives, and technology procurement.

Achieving Greater Policy Coherence Among Institutional Levels

Findings show that policy coherence is a factor that leads to improved preparedness and implementation capacity within institutions. The alignment of strategic plans, e-transform models, ICT policies, and strategies for teaching and learning should thus be considered by policymakers. Good policy vision, together with a participatory approach in developing a policy, may reduce fragmentation while cultivating a common vision for e-transformation. The senior management at the institutions should thus set frameworks that enable alignment and consistent interpretation of policy within the faculties.

Turning Crises into Opportunities for Structured Innovations

Although crises should not be a central force in adapting to developments in digital technology, they provide a very compelling environment to facilitate reflection and innovation. It is necessary that institutions make use of post-crisis learning practices such as after-action reviews, which enable learning from experiences, identifying impediments, as well as reflecting on and adapting to innovations that are created during a situation of a crisis. Policymakers need to facilitate learning by making resilience planning a central force for adaptation.

Framing a Digital Resilience Structure

It is evident that a comprehensive approach is necessary for digital resilience that links leadership, professional development, infrastructure, and policy alignment from this research. It is therefore essential that institutions develop comprehensive frameworks for digital resilience that clarify goals, roles, and evidence-informed approaches to preparedness, as well as innovation in a digital setting. Such frameworks can be linked to quality assurance and planning cycles to make progress.

CONCLUSION

The research explores how educational institutions navigate digital transformation, though, and across leadership practices, learning cultures, policy contexts, and responses to disruptions. This research concluded that the concept of digital resilience is a complex phenomenon that is shaped by human and structural factors. The themes that cut across, from this research, are leadership practices that are distributed, communities of practice, visionary leadership, innovation in times of crisis, and policy coherence, which layer on top of one another to enable the necessary conditions for a positive adaptation into digital capacity within institutions.

The implications of the findings are that digital transformation is not a technological issue but, on the contrary, a highly social process. This is because, with distributive leadership, there is shared ownership that helps several members within an institution take part in developing an improved form of education through digitization. Communities of practice are infrastructural in ensuring that learning takes place within the peer group, which is a way for teachers to gain more confidence and tackle challenges that come along the way. In all these, visionary leadership is the only component that ensures that digitization is rooted in the organizational goals.

In relation to that, it emphasizes the challenges that would require constant attention. The potential that crises revealed for innovation in institutions might never have been revealed, but alongside that, certain discrepancies, especially regarding inequality, might have been revealed as well. In this regard, policy coherence is a necessary condition within a situation where a certain inequality must be remedied.

Taken together, these findings contribute to the overall conversation on digital resilience in education, and they are meant to affirm that the emergence of resilient development is a result of the interrelationship of leadership, policy, shared sense of culture, and equity in infrastructure. This research has demonstrated that the development of digital resilience in students is not merely the result of a short-term solution but a long-term commitment.

Future studies might follow on from this work by including perspectives from educators, students, and administrators via interviews or even an ethnographic setting, which would enable a far more thorough understanding of the experiences of digital transformation. Comparison within a different geographical setting might shed further light on the factors influencing digital resilience, for instance.

Lastly, the research clearly indicates that for institutions which aim at developing a competitive digital environment, they need to create a setting that is conducive to technological readiness as well as human Readiness to Change.

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