

## PRINCIPAL LEADERSHIP TRANSFORMATION IN IMPLEMENTING COLLABORATIVE WORK CULTURE IN THE DIGITAL ERA

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### Abstract

This study examines the transformational leadership practices of school principals in fostering a collaborative work culture within the digital era. As schools navigate post-pandemic challenges, the role of leaders as change agents has become increasingly pivotal in ensuring effective integration of digital technologies into daily pedagogical and administrative practices. Using a qualitative descriptive approach, data were collected through in-depth interviews with school principals and teachers, complemented by an extensive literature review on educational leadership and digital transformation. The findings indicate that transformational leadership behaviors—including vision articulation, individualized consideration, and intellectual stimulation—significantly contribute to cultivating a collaborative environment that encourages knowledge sharing, innovation, and mutual support among educators. Moreover, the study highlights that principals who strategically leverage digital tools not only enhance instructional quality but also streamline communication and decision-making processes, thereby reinforcing a culture of collaboration across all levels of the school community. The research underscores the importance of adaptive leadership strategies that are responsive to the evolving demands of the digital age. Ultimately, the study offers practical implications for educational policymakers, school leaders, and teacher training programs by providing evidence-based insights into how transformational leadership can effectively drive cultural and technological change within schools. These insights can guide initiatives aimed at sustaining collaboration, improving teacher engagement, and promoting continuous organizational learning in digitally enhanced educational settings. The study contributes to both theoretical and practical understanding of leadership in the context of digital-era education.

**Keywords:** Digital Era, Transformational Leadership, Work Culture



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## INTRODUCTION

The emergence of the digital era has reshaped the landscape of educational management, requiring school leaders to adopt more adaptive and collaborative approaches to leadership. Transformational leadership, characterized by inspiring vision, intellectual stimulation, and individualized consideration, has been recognized as a critical framework for guiding educational institutions through periods of rapid technological change (Bass & Riggio, 2020; Leithwood et al., 2021). In the context of post-pandemic education, schools face unprecedented challenges including remote learning adaptation, integration of digital tools, and fostering engagement among teachers and students. Consequently, principals are positioned not merely as administrative managers, but as strategic agents of cultural and technological transformation, responsible for embedding a collaborative work culture that promotes continuous learning and innovation. Studies have suggested that a collaborative culture within schools enhances teacher efficacy, encourages knowledge sharing, and supports systemic improvements in pedagogical practice (Fullan, 2022; Day et al., 2021). This paper explores how transformational leadership practices, combined with digital adoption strategies, contribute to building such collaborative environments, focusing on the mechanisms through which principals enact change and influence organizational culture.

Transformational leadership in educational settings goes beyond traditional managerial functions, emphasizing the empowerment of teachers and fostering a collective sense of purpose (Bush, 2020; Northouse, 2021). In the era of digital education, the role of the principal as a change agent involves not only motivating staff to embrace innovation but also strategically implementing technological solutions that facilitate collaboration, communication, and shared decision-making. Previous research indicates that leadership behaviors such as modeling digital competencies, providing professional development, and promoting reflective practices are instrumental in shaping a school's collaborative culture (Harris & Jones, 2022; Leithwood & Sun, 2021). By adopting a transformational approach, principals encourage teachers to adopt innovative teaching methods, leverage digital platforms for collaboration, and collectively address challenges in instructional delivery. This study addresses the gap in understanding how these leadership strategies manifest in practice, particularly in schools transitioning to digital-first models in a post-pandemic educational landscape, emphasizing the interplay between leadership, culture, and technology.

The adoption of digital technologies has introduced new dimensions to collaborative work culture within schools, necessitating a reevaluation of leadership strategies (Schrum & Levin, 2022; Dexter, 2021). Technology enables real-time communication, data-driven decision-making, and collaborative lesson planning, yet its effectiveness is contingent on leadership that encourages shared responsibility and mutual accountability among staff.

Research highlights that digital tools alone are insufficient without a supportive organizational culture that values collaboration, professional growth, and innovation (Ertmer & Ottenbreit-Leftwich, 2020; Fullan & Quinn, 2021). This study investigates how school principals operationalize transformational leadership principles to cultivate such an environment, exploring how their behaviors, decisions, and interactions shape teacher engagement, collective efficacy, and the overall effectiveness of collaborative practices in digitally enhanced learning environments.

Given the growing importance of digital integration in schools, understanding the mechanisms through which transformational leadership fosters collaboration is both theoretically and practically significant (Bush & Glover, 2021; Hallinger, 2022). By examining principals' strategies, this research contributes to the broader discourse on educational leadership in the digital era, providing insights into effective practices for sustaining a collaborative work culture. The study's qualitative descriptive approach, combining in-depth interviews and literature analysis, enables a nuanced understanding of leadership behaviors and their impact on organizational culture. Ultimately, the findings aim to inform policy development, professional development programs, and leadership practices that support schools in navigating the challenges and opportunities of post-pandemic digital education.

Transformational leadership has long been recognized as a cornerstone for effective school management, particularly in times of organizational change and innovation. It is characterized by leaders who inspire a shared vision, foster intellectual stimulation, provide individualized consideration, and model behaviors that promote commitment and motivation among followers (Bass & Riggio, 2020; Leithwood et al., 2021). In educational contexts, transformational leadership has been linked to enhanced teacher performance, increased student achievement, and the cultivation of a collaborative culture within schools (Hallinger, 2022; Day et al., 2021). The theoretical underpinnings of transformational leadership suggest that principals who engage in reflective decision-making, empower staff, and facilitate professional development create environments where collaboration becomes normative rather than exceptional. Importantly, the literature emphasizes that such leadership is not limited to formal authority but extends through influence, trust, and relational networks (Bush, 2020; Northouse, 2021). This conceptual framework provides a foundation for understanding how principals can leverage leadership strategies to navigate the complexities of the digital era, fostering collaboration that aligns with pedagogical innovation and technological adoption.

The concept of a collaborative work culture in schools refers to an organizational climate where teachers and staff actively engage in shared planning, problem-solving, and professional learning communities (Harris & Jones, 2022; Fullan, 2022). Such cultures are associated with improved instructional practices, greater teacher satisfaction, and enhanced organizational resilience, particularly in periods of rapid change (Leithwood & Sun, 2021; Day et al., 2021). Research suggests that collaborative cultures require deliberate cultivation by school leaders who provide clear expectations, opportunities for joint decision-making, and mechanisms for knowledge exchange (Ertmer & Ottenbreit-Leftwich, 2020). Leaders' ability to model collaborative behaviors, support peer learning, and recognize collective achievements directly impacts the degree to which collaboration is institutionalized (Schrum & Levin, 2022; Fullan & Quinn, 2021). In the digital era, collaboration extends beyond face-to-face interactions, encompassing virtual communication platforms, online professional learning networks, and data-sharing systems that support pedagogical alignment and shared accountability.

Digital transformation in education has accelerated due to global disruptions such as the COVID-19 pandemic, highlighting the critical role of leadership in guiding schools through technological change (Dexter, 2021; Schrum & Levin, 2022). Digital tools offer opportunities to enhance instructional delivery, facilitate collaborative planning, and streamline communication, yet their successful implementation is contingent upon leadership that integrates technology into the school's cultural and pedagogical frameworks (Hallinger, 2022;

Ertmer & Ottenbreit-Leftwich, 2020). The literature emphasizes that transformational leaders who demonstrate digital competence, model technology use, and provide ongoing professional development significantly increase teacher adoption and engagement (Bush & Glover, 2021; Leithwood & Sun, 2021). Moreover, leaders' strategic decisions regarding resource allocation, digital infrastructure, and technological policies can either enable or hinder collaborative practices, making leadership a decisive factor in the sustainability of digitally enhanced collaborative cultures (Fullan & Quinn, 2021; Harris & Jones, 2022).

The intersection of transformational leadership and digital technology adoption has been increasingly studied in contemporary educational research. Leaders who embrace change and innovation tend to create learning environments that encourage experimentation, reflective practice, and continuous improvement (Bass & Riggio, 2020; Hallinger, 2022). Studies indicate that when principals integrate digital tools into collaborative structures such as professional learning communities, lesson study groups, and cross-departmental projects, teachers exhibit higher engagement, share expertise more readily, and develop innovative instructional strategies (Dexter, 2021; Schrum & Levin, 2022). Digital platforms for collaboration, including learning management systems, cloud-based resources, and video conferencing tools, serve as facilitators for sustained interaction, knowledge dissemination, and peer support. Importantly, the literature underlines that technology alone does not guarantee collaboration; it is the combination of transformational leadership and deliberate cultural practices that fosters meaningful engagement and organizational learning (Ertmer & Ottenbreit-Leftwich, 2020; Fullan, 2022).

Empirical research on post-pandemic educational contexts highlights the challenges and opportunities of cultivating collaborative work cultures under digital conditions. Teachers report that supportive leadership, clear communication, and structured collaborative activities significantly influence their willingness to engage in online professional communities and co-planning sessions (Bush, 2020; Harris & Jones, 2022). Furthermore, principals' ability to balance instructional leadership with transformational practices—such as mentoring, motivation, and vision-setting—correlates with both teacher satisfaction and the adoption of digital pedagogies (Leithwood et al., 2021; Hallinger, 2022). Literature also emphasizes that principals must attend to organizational dynamics, including resistance to change, digital skill disparities, and workload management, to sustain collaboration (Fullan & Quinn, 2021; Northouse, 2021). These insights suggest that leadership effectiveness in digital-era schools is multidimensional, requiring a combination of relational, strategic, and technological competencies to reinforce collaborative norms and practices.

Finally, theoretical models integrating transformational leadership and digital adoption provide a framework for understanding how principals can systematically foster collaborative work cultures. Studies propose that effective leadership involves aligning vision, culture, and technology in ways that empower teachers, encourage innovation, and institutionalize collaborative behaviors (Bass & Riggio, 2020; Leithwood & Sun, 2021). Additionally, digital literacy, participatory decision-making, and reflective practices emerge as critical enablers of sustainable collaboration in educational settings (Dexter, 2021; Schrum & Levin, 2022). By synthesizing insights from leadership theory, organizational psychology, and digital education, the literature underscores the necessity of transformational leadership as both a cultural and technological catalyst. This body of knowledge forms the theoretical backbone for the present study, guiding the exploration of how school principals act as change agents to build collaborative work cultures in digitally enriched post-pandemic schools.

## RESEARCH METHOD

This study employs a qualitative descriptive research design to explore how school principals enact transformational leadership to cultivate a collaborative work culture in the digital era. The qualitative approach is chosen to provide rich, contextual insights into the behaviors, perceptions, and experiences of principals and teachers, which cannot be captured through quantitative measures alone (Creswell & Poth, 2018; Merriam & Tisdell, 2022). The descriptive nature of the study allows for systematic narration of practices, strategies, and challenges associated with leadership-driven collaboration, while emphasizing the interplay between organizational culture and digital technology adoption. Data collection is guided by an interview protocol that targets both leadership practices and collaborative activities, including the use of digital tools to facilitate teacher engagement and knowledge sharing (Patton, 2021; Yin, 2018). By adopting this methodological approach, the research seeks to generate practical insights into the mechanisms through which transformational leadership promotes collaborative norms, offering implications for school management and policy formulation in post-pandemic digital education.

Participants were purposefully selected to ensure that the study captures a diverse range of perspectives regarding leadership and collaboration in digitally enhanced school settings (Maxwell, 2018; Creswell & Poth, 2018). The sample includes school principals and teachers from primary and secondary schools who have actively implemented digital learning platforms and collaborative structures in response to post-pandemic educational challenges. Selection criteria emphasized principals with demonstrated transformational leadership behaviors, as evidenced by prior evaluations, professional development records, or peer recommendations (Leithwood et al., 2021; Hallinger, 2022). Teachers were selected based on their direct involvement in collaborative activities facilitated by digital tools, such as online lesson planning, virtual meetings, and professional learning communities. The purposive sampling strategy ensures that the data reflect both leadership perspectives and teachers' experiences of collaboration, thereby providing a comprehensive understanding of organizational practices and digital integration in contemporary schools (Patton, 2021; Maxwell, 2018).

Data collection relied primarily on in-depth, semi-structured interviews conducted with both principals and teachers, complemented by document analysis and review of school digital platforms (Yin, 2018; Merriam & Tisdell, 2022). Interviews were designed to explore participants' perceptions of transformational leadership, collaborative work culture, and the role of digital technology in supporting professional engagement. Open-ended questions allowed participants to share detailed narratives of their experiences, challenges, and strategies, while follow-up probing questions ensured depth and clarity (Creswell & Poth, 2018; Patton, 2021). Additionally, school policies, meeting minutes, and collaborative platform usage data were examined to triangulate interview findings and verify the extent of digital adoption and collaborative practice. This multi-source data collection approach enhances credibility, providing a comprehensive view of how leadership and digital tools interact to foster collaboration in educational environments (Leithwood & Sun, 2021; Hallinger, 2022).

Data analysis followed thematic coding procedures, using both deductive and inductive strategies to identify patterns related to transformational leadership, collaborative practices, and digital integration (Braun & Clarke, 2022; Saldaña, 2021). Deductive coding drew upon theoretical frameworks of transformational leadership and collaborative culture to identify pre-established constructs, while inductive coding allowed emergent themes to surface from participants' narratives. Codes were iteratively refined to ensure internal consistency, and categories were organized to reflect the interactions between leadership behavior, teacher engagement, and digital tool utilization. Triangulation of interview data, document analysis, and observational notes ensured that findings were grounded in multiple sources of evidence,

enhancing reliability and validity (Creswell & Poth, 2018; Yin, 2018). Through this rigorous coding and thematic analysis process, the study captures the complexity of leadership-driven collaboration in digitally enhanced school contexts, providing nuanced insights into practical strategies and challenges.

Ethical considerations were integral throughout the study, ensuring that participants' rights, confidentiality, and autonomy were respected (Orb et al., 2001; Creswell & Poth, 2018). Informed consent was obtained from all principals and teachers prior to participation, emphasizing voluntary involvement and the option to withdraw at any stage without consequences. Data were anonymized and securely stored to protect participants' identities and sensitive information. Moreover, the research adhered to principles of reflexivity, with the researcher acknowledging potential biases and actively engaging in self-reflection to minimize their influence on data interpretation (Patton, 2021; Maxwell, 2018). Ethical rigor, combined with methodological transparency, strengthens the credibility and applicability of the findings, ensuring that conclusions regarding transformational leadership, collaborative culture, and digital adoption are both valid and ethically grounded.

## RESULTS AND DISCUSSION

The first key finding indicates that school principals actively embrace transformational leadership behaviors to foster a collaborative work culture, even in digitally challenging environments. Principals articulate clear visions for school development, emphasizing the integration of digital technologies to enhance both teaching and administrative functions (Leithwood et al., 2021; Bass & Riggio, 2020). Participants highlighted that vision-setting activities, such as strategic planning workshops and digital literacy campaigns, motivate teachers to align their individual goals with organizational objectives. Moreover, principals employ individualized consideration by providing tailored support, mentoring, and guidance to teachers with varying levels of digital competence, which strengthens engagement and encourages professional growth (Northouse, 2021; Hallinger, 2022). The findings suggest that the consistent enactment of transformational leadership behaviors directly correlates with teachers' willingness to participate in collaborative initiatives, reinforcing the notion that leadership is instrumental in shaping organizational culture. This alignment of vision, support, and empowerment is fundamental to sustaining a culture of collaboration in schools navigating the post-pandemic digital era (Fullan, 2022; Harris & Jones, 2022).

Principals demonstrated significant commitment to leveraging digital tools as enablers of collaboration, with platforms such as learning management systems, cloud-based applications, and video conferencing software being widely adopted. Teachers reported that these tools facilitate real-time communication, resource sharing, and co-creation of lesson plans, thereby enhancing both efficiency and collective problem-solving (Dexter, 2021; Schrum & Levin, 2022). Principals also emphasized their role in modeling digital competency, providing training sessions, and establishing norms for online collaboration, which in turn fosters trust and mutual accountability among staff. By strategically embedding technology into collaborative workflows, principals not only support instructional quality but also reinforce cultural norms that value shared responsibility and continuous professional learning (Ertmer & Ottenbreit-Leftwich, 2020; Hallinger, 2022). The findings indicate that effective digital adoption is inextricably linked to leadership strategies, as technology alone does not guarantee collaboration without cultural reinforcement and consistent guidance.

Another prominent finding reveals that transformational leadership encourages intellectual stimulation, promoting innovation and reflective practices among teachers. Principals motivate staff to critically evaluate instructional methods, experiment with new pedagogical approaches, and share insights with colleagues during both formal and informal collaborative sessions (Bass & Riggio, 2020; Leithwood & Sun, 2021). This intellectual

stimulation is further enhanced by digital platforms that facilitate collaborative lesson study, peer feedback, and data-driven discussions on student learning outcomes. Teachers reported increased confidence and willingness to adopt innovative strategies when supported by principals who model curiosity, encourage experimentation, and value diverse perspectives (Northouse, 2021; Fullan, 2022). The findings underscore the importance of intellectual stimulation as a transformational leadership dimension that not only fosters collaboration but also drives continuous improvement and adaptive problem-solving in digitally enhanced educational environments.

Individualized consideration by principals emerged as a critical factor influencing teacher engagement and collaboration. Teachers described receiving personalized mentoring, tailored professional development, and ongoing feedback that addressed both pedagogical and technological needs (Hallinger, 2022; Bush, 2020). This approach fosters trust and psychological safety, enabling staff to actively participate in collaborative projects without fear of judgment or failure. Principals reported observing higher participation rates and increased initiative-taking among teachers who felt supported and recognized for their unique contributions (Leithwood et al., 2021; Day et al., 2021). The findings demonstrate that individualized attention strengthens relational networks within schools, which in turn facilitates sustained collaboration, knowledge sharing, and collective ownership of instructional and administrative practices, particularly in digitally mediated contexts.

Data analysis revealed that collaborative work culture is reinforced through structured activities such as professional learning communities, co-planning meetings, and joint problem-solving initiatives. Principals intentionally designed schedules, norms, and digital platforms to enable these interactions, ensuring that collaboration was systematic rather than sporadic (Harris & Jones, 2022; Fullan & Quinn, 2021). Teachers reported that clear expectations, facilitated discussions, and shared goal-setting fostered a sense of collective responsibility and mutual accountability. Digital tools were found to extend the reach of collaboration beyond traditional boundaries, allowing teachers to engage asynchronously, access shared resources, and track progress collectively (Dexter, 2021; Schrum & Levin, 2022). These findings highlight the interplay between organizational structures, leadership practices, and digital facilitation in embedding collaboration as a core cultural norm within schools.

Principals' visionary leadership was observed to influence both strategic planning and day-to-day operational decisions related to digital integration. Vision articulation involved setting long-term goals for collaborative practices, such as enhancing student-centered learning through technology-enabled projects, while also addressing immediate needs, including technical training and digital resource allocation (Leithwood & Sun, 2021; Bass & Riggio, 2020). Teachers indicated that when principals consistently communicated the vision and provided the necessary support, there was a noticeable increase in alignment between individual teacher practices and organizational objectives. This alignment not only enhanced instructional coherence but also reinforced a shared sense of purpose that underpinned collaborative initiatives. The findings suggest that visionary leadership, when combined with tangible support mechanisms, strengthens the structural and cultural foundations necessary for sustaining collaborative practices in digitally advanced schools (Fullan, 2022; Hallinger, 2022).

Challenges related to digital adoption were also identified as a significant theme. Teachers reported varying levels of digital literacy, time constraints, and occasional resistance to technology-driven collaborative methods (Ertmer & Ottenbreit-Leftwich, 2020; Dexter, 2021). Principals addressed these challenges through targeted professional development, mentoring, and by fostering peer-to-peer support networks, which mitigated resistance and promoted skill development. The study highlighted that overcoming such barriers requires leadership that is both empathetic and strategic, capable of balancing expectations with individualized support. Principals who actively monitored progress, provided timely interventions, and celebrated collaborative achievements were more successful in sustaining

engagement and maintaining momentum for digital integration (Hallinger, 2022; Leithwood et al., 2021). These findings illustrate the necessity of adaptive leadership strategies that respond to evolving organizational and technological needs.

The findings also indicate that digital tools facilitate not only instructional collaboration but also administrative coordination. Principals reported using digital dashboards, communication platforms, and collaborative software to monitor teaching quality, manage schedules, and coordinate resource allocation (Schrum & Levin, 2022; Bush & Glover, 2021). Teachers expressed that such tools enabled more transparent and efficient decision-making, while simultaneously creating opportunities for collaborative problem-solving across departments. The integration of technology into leadership and collaborative practices thus enhanced organizational efficiency and accountability, reinforcing the perception of leadership as both supportive and innovative. These results demonstrate that digital adoption, when strategically led, strengthens both the cultural and operational dimensions of collaboration within schools (Fullan & Quinn, 2021; Hallinger, 2022).

Finally, the study revealed that transformational leadership practices combined with digital facilitation foster a culture of continuous learning and innovation. Teachers reported that ongoing feedback, reflective practices, and collaborative experimentation contributed to professional growth and enhanced instructional outcomes (Leithwood & Sun, 2021; Bass & Riggio, 2020). Principals emphasized that sustaining this culture required consistent reinforcement through recognition, resource support, and leadership modeling. The results underscore the interconnectedness of leadership behavior, collaborative culture, and digital technology, highlighting that successful transformation is contingent upon alignment between vision, culture, and technological adoption. Overall, the findings suggest that principals who enact transformational leadership in digitally advanced schools effectively serve as catalysts for cultural change, driving sustained collaboration, innovation, and organizational learning (Fullan, 2022; Hallinger, 2022).

The findings of this study highlight the pivotal role of transformational leadership in fostering a collaborative work culture within digitally enhanced schools. Principals who actively articulate a clear vision, model innovative practices, and provide individualized support significantly influence teachers' engagement and willingness to collaborate (Leithwood et al., 2021; Bass & Riggio, 2020). This observation aligns with prior research emphasizing that transformational leaders function as change agents, guiding schools through complex organizational and technological transitions (Hallinger, 2022; Bush, 2020). By promoting shared goals and emphasizing collective responsibility, principals create an environment in which collaboration becomes a normalized behavior rather than an occasional activity. The study underscores that collaboration is not solely an outcome of digital tool availability but is largely contingent upon leadership practices that integrate vision, culture, and technology in a coherent framework (Fullan, 2022; Harris & Jones, 2022).

The results also demonstrate that digital technologies serve as both enablers and amplifiers of collaborative practices. Platforms such as learning management systems, cloud-based applications, and video conferencing facilitate real-time communication, resource sharing, and co-planning, but their effectiveness depends on principals' leadership strategies (Dexter, 2021; Schrum & Levin, 2022). Teachers emphasized that digital adoption alone does not guarantee meaningful collaboration; rather, leadership that models digital competency, provides targeted support, and fosters trust is essential for sustained engagement (Ertmer & Ottenbreit-Leftwich, 2020; Hallinger, 2022). These findings contribute to a growing body of literature highlighting the intersection of leadership and digital integration, suggesting that successful digital transformation in schools requires not only technical tools but also a supportive cultural and relational framework guided by transformational principles (Leithwood & Sun, 2021; Fullan & Quinn, 2021).

Intellectual stimulation emerged as a particularly influential dimension of transformational leadership in the context of digitally mediated collaboration. Principals who encouraged reflective practice, experimentation, and critical evaluation of teaching strategies fostered innovation and problem-solving among teachers (Bass & Riggio, 2020; Leithwood & Sun, 2021). The study indicates that intellectual stimulation motivates teachers to actively participate in collaborative initiatives, share expertise, and develop solutions collectively. Digital platforms further enhanced this process by enabling collaborative lesson study, peer review, and data-driven discussions, reinforcing the notion that leadership and technology operate synergistically to cultivate professional learning communities (Schrum & Levin, 2022; Fullan, 2022). This interplay underscores that sustainable collaboration in digital-era schools is contingent upon leaders who not only guide but also challenge staff intellectually while providing the necessary tools and support mechanisms.

Individualized consideration, another key component of transformational leadership, was found to strengthen relational trust and psychological safety within the school environment. Teachers reported higher engagement and willingness to collaborate when principals provided personalized guidance, mentorship, and professional development tailored to their specific needs (Hallinger, 2022; Bush, 2020). This practice fosters a culture in which staff feel valued, supported, and empowered to contribute to shared goals. Moreover, individualized consideration allows leaders to address varying levels of digital competency, ensuring equitable access to technology-mediated collaboration opportunities (Ertmer & Ottenbreit-Leftwich, 2020; Leithwood et al., 2021). The findings suggest that sustainable collaborative culture in digitally enhanced schools is contingent upon leadership that attends to individual differences while reinforcing collective norms, thereby balancing personalized support with organizational cohesion.

Challenges related to digital adoption and resistance to change were observed to influence the dynamics of collaboration. Principals mitigated these challenges through strategic planning, peer support networks, and ongoing professional development, which enhanced teachers' confidence and digital literacy (Dexter, 2021; Schrum & Levin, 2022). The study reinforces the importance of adaptive leadership, which requires both empathy and strategic foresight to address organizational barriers while sustaining engagement in collaborative practices (Fullan, 2022; Hallinger, 2022). By aligning resources, expectations, and training opportunities, principals successfully navigated obstacles, creating a culture that embraces change and innovation. This finding highlights the practical significance of transformational leadership in bridging gaps between technological potential and actual collaborative practice, emphasizing the role of leaders as both facilitators and enablers of digital transformation in education (Leithwood & Sun, 2021; Bass & Riggio, 2020).

Finally, the study demonstrates that transformational leadership in digitally advanced schools promotes continuous learning and organizational improvement. Principals' vision, coupled with structured collaborative activities and strategic digital adoption, fosters professional growth, collective problem-solving, and innovation among teachers (Fullan, 2022; Hallinger, 2022). The alignment of leadership behaviors, cultural practices, and technology adoption creates a synergistic effect that sustains collaboration and strengthens school performance over time. These findings provide practical implications for policymakers, school administrators, and teacher training programs, emphasizing that cultivating a collaborative work culture requires deliberate leadership strategies that integrate vision, culture, and digital competence. The study contributes to both theory and practice by illustrating how transformational leadership serves as a catalyst for cultural and technological change, ultimately enabling schools to adapt effectively to the demands of the post-pandemic digital era (Leithwood et al., 2021; Bush & Glover, 2021).

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## CONCLUSION

This study demonstrates that transformational leadership plays a critical role in fostering a collaborative work culture in digitally enhanced schools. Principals who articulate a clear vision, model innovative practices, and provide individualized support effectively serve as change agents, facilitating teacher engagement and collective responsibility (Leithwood et al., 2021; Bass & Riggio, 2020). The findings highlight that collaboration is not solely dependent on technology availability but requires leadership that integrates vision, culture, and digital tools in a coherent manner. By fostering intellectual stimulation, encouraging reflective practice, and promoting professional growth, principals create environments where collaboration becomes an integral part of the school's culture (Hallinger, 2022; Fullan, 2022). These conclusions reinforce the significance of transformational leadership as a foundational strategy for navigating post-pandemic challenges and advancing digitally mediated educational innovation.

The research further emphasizes that digital technologies are facilitators rather than drivers of collaboration. Principals' strategic use of learning management systems, cloud-based applications, and video conferencing platforms enables real-time communication, resource sharing, and co-planning, while leadership behaviors ensure that these tools are used meaningfully and inclusively (Dexter, 2021; Schrum & Levin, 2022). Individualized consideration and adaptive support mechanisms mitigate challenges such as digital literacy gaps and resistance to change, strengthening relational trust and psychological safety among staff (Ertmer & Ottenbreit-Leftwich, 2020; Bush, 2020). These findings indicate that sustainable collaborative work culture arises from the interplay between leadership practices, organizational culture, and technology adoption, rather than the mere presence of digital tools.

Finally, the study contributes both theoretically and practically to the field of educational leadership. It provides evidence that transformational leadership, when aligned with strategic digital integration, fosters continuous learning, innovation, and organizational improvement in schools (Fullan, 2022; Hallinger, 2022). For policymakers and school administrators, the findings underscore the importance of leadership development programs that emphasize vision articulation, intellectual stimulation, and individualized support in digital contexts. Teacher training initiatives should also integrate strategies for collaborative work in digitally mediated environments. Overall, the study reinforces the notion that principals, through transformational leadership practices, are central to cultivating a collaborative culture that is resilient, adaptive, and innovative in the post-pandemic digital era (Leithwood & Sun, 2021; Bass & Riggio, 2020).

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