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Unpacking the Drivers and Barriers of Digital Leadership Practice in Education: A Study of High School Leaders' Experiences

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ABSTRACT

In the age of digitalization, technology has become a driving force, transforming various sectors, including education. This study investigated the barriers and drivers influencing high school leaders' engagement with digital technologies in high schools. Through a quantitative research approach, 220 high school leaders from Oyo State, Nigeria, participated in the study, providing data through structured questionnaires. The study's theoretical framework is anchored on Lewin's Three-Step Model of Change. Findings revealed significant barriers, such as inadequate training, resistance to change, and budgetary constraints, hindering the seamless integration of digital tools. However, despite these obstacles, leaders are motivated by potential benefits like enhanced communication, improved student outcomes, and future readiness to embrace digital leadership. The study underscores the critical role of leadership in fostering innovation, leveraging technology for strategic decision-making, and driving transformative change in educational institutions. Recommendations include prioritizing continuous professional development, proactively addressing barriers, fostering innovation, and developing clear digital strategies that align with organizational goals. These are crucial for successfully implementing digital leadership initiatives in high schools. This study provides empirical evidence on barriers and drivers influencing digital leadership practices among high school leaders, enriching existing literature on digital transformation and guiding effective strategies.

Keywords: *Digital Leadership, Drivers, Barriers, Digital Transformation, High School Leaders*

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INTRODUCTION

Technology has become an ever-evolving force in the era of globalization, transforming several sectors, including education. Hence, the organization's management has seen a tremendous transformation attributable to digital innovation, which has increased productivity and efficiency via digital tools and platforms. This has improved employee competencies and leadership approaches.[1]

[1] Jari Collin et al., "IT Leadership in Transition-The Impact of Digitalization on Finnish Organizations," 2015; K. R. Iansiti, M., & Lakhani, *Competing in the Age of AI: Strategy and Leadership When Algorithms and Networks Run the World* (Brighton, MA:

However, digital technologies provide benefits and threats to organizations, and failure to take cognizance of this competitiveness may be counterproductive. Thus, organizational leaders must adjust organizational frameworks and use innovative methods, and staff members must be prepared for this change.[2] Therefore, incorporating digital innovations into the leadership style heralded by the Fourth Industrial Revolution (4IR) comes with several advantages, advancements, and challenges. Zulu and Khosrowshahi corroborated that organizations are contending with unprecedented barriers as the digital terrain rapidly changes.[3]

Meanwhile, Gupta revealed that the demands of this change should not be seen in the light of technical elements alone as presented by digitization; instead, management should equally pay necessary attention to the organizational and human elements.[4] Lewin highlights that for a change to be implemented successfully, the driving factors(drivers) must constantly be greater than the resisting forces (barriers) since there are conflicting forces at every level of transformation.[5] Therefore, since technology is a major factor driving this change, organizations must adapt to stay relevant and competitive. Those who oppose this change may be unable to endure its impact.[6] This was further affirmed that the interplay of technological changes and organizational change is bound to result in consequential or complementary organizational changes.[7] The consequential change may be adversarial, while the complementary effect may benefit the organization.

In a study on barriers and drivers of digital transformation in public organizations, Tangi et al. unveiled the barriers to digital technology-driven organizational transformation as structural and cultural.[8] Structural barriers include lack of managerial support, lack of political support, lack of available skills, shortage of personnel, organizational complexity, and lack of coordination among the departments, while cultural barriers involve employee behaviors that can impede change, which involve resistance to change, bureaucratic culture and fear of innovation. On the other hand, Tangi et al. identified drivers of organizational transformation, which include internal and external drivers.[9] The internal drivers include the strength of internal leadership, internal dissatisfaction about the status quo, and expected benefits for the administration, while external drivers involve external pressure and external legal obligations.

Digital leadership practice in school management equally has drivers and barriers to contend with in the digital transformation era. The current reality will not entertain compromise; as a result, school administrators must adapt and adjust to the transformative velocity as reported by Gupta, quoting Hans Vestberg of Ericsson that "the pace of change will never be as slow again as it is today."[10] In other words, outstanding past performance would not count today and tomorrow, except for organizations and schools that adapt to the change. It might be misleading to place too much emphasis

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Harvard Business Press, 2020); Goh Kok Ming and Mahaliza Mansor, "Unpacking the Realities of Digital Leadership Among School Leaders : A Quantitative Study" 9, no. 4 (2024).

[2] S. Gupta, "Organizational Barriers to Digital Transformation," *Unpublished Master of Science Thesis INDEK TRITA-ITM-EX 2018:359 KTH Industrial Engineering and Management Industrial Management SE-100 44 STOCKHOLM*, 2018.

[3] Sambo Lyson Zulu and Farzad Khosrowshahi, "A Taxonomy of Digital Leadership in the Construction Industry," *Construction Management and Economics* 39, no. 7 (July 3, 2021): 565–78, https://doi.org/10.1080/01446193.2021.1930080.

[4] Gupta, "Organizational Barriers to Digital Transformation," 2018.

[5] Kurt Lewin, *Field Theory of Social Science: Selected Theoretical Papers*, ed. Dorwin Cartwright (New York: Harper & Brothers, 1951).

[6] Sharon A Cox, "A Framework for Exploring IT-Led Change in Morphing Organizations," in *Advanced Methodologies and Technologies in Business Operations and Management* (IGI Global, 2019), 296–310; V. Kral, P. and Kralova, "Approaches to Changing Organisational Structure: The Effect of Drivers and Communication," *Journal of Business Research* 69, no. 11 (2016): 5169–5174.

[7] N. Greenan, "Organisational Change, Technology, Employment and Skills: An Empirical Study of French Manufacturing," *Cambridge Journal of Economics* 27, no. 2 (2003): 287–316; S.S. Pao-Long, C. and Lung, "Organisational Changes for Advanced Manufacturing Technology Infusion: An Empirical Study," *International Journal of Management* 19, no. 2 (2002): 206; Zulu and Khosrowshahi, "A Taxonomy of Digital Leadership in the Construction Industry."

[8] G. Tangi, et al., "Barriers and Drivers of Digital Transformation in Public Organizations: Results from a Survey in the Netherlands," in *19th IFIP WG 8.5 International Conference, EGOV 2020 Linköping, Sweden, August 31 – September 2, 2020 Proceedings*, ed. G. Viale Pereira et al. (Eds.) (Springer Nature Switzerland AG 2020: EGOV 2020, LNCS 12219, 2020), 42–56, https://doi.org/https://doi.org/10.1007/978-3-030-57599-1_4.

[9] Tangi et al.a, "Barriers and Drivers of Digital Transformation in Public Organizations: Results from a Survey in the Netherlands."

[10] Gupta, "Organizational Barriers to Digital Transformation," 2018.

on past achievements since what will ultimately drive the achievement of an organization may differ significantly from what drove it in the past.[11] This was also corroborated by Venkatraman, who said that "past performance is no indicator of future returns."[12] Thus, school management, driven by traditional leadership styles in the digital transformation era, must adapt quickly to have a competitive edge in the age of digitalization. Hence, organizations need to embark on continuous appraisal of drivers as well as barriers to digital leadership practice in the context of this study. Therefore, effectively adapting to digital leadership practice may remain challenging in the digitally-driven environment considering the opposing forces of drivers and barriers. Meanwhile, school leaders seem to have no option than to navigate these complexities of using digital tools to enhance teaching, communication and innovative leadership. This study is interested in unraveling what drives and impedes high school leaders' application of digital leadership. Therefore, this study seeks to investigate high school leaders' experiences on drivers and barriers of digital leadership practice. In order to achieve this research objective, two research questions are raised as follows:

1. What barriers do high school leaders face in leveraging digital technologies to enhance digital leadership practices?
2. What key drivers propel high school leaders to engage in digital leadership practices in their school environment?

LITERATURE REVIEW

Digital Leadership Practice

Digital technology has significantly influenced the 21st century's learning, teaching, and school administration. It has revolutionized education, specifically impacting how schools make data-driven decisions, improve communication, and use cutting-edge teaching strategies. Al-Ashmawi et al. contended that education improves based on how well it can incorporate and keep up with information and communication technology advancements, and school leadership plays a crucial role in implementing technology across the school community.[13] The pivotal role of school leadership in promoting and using digital technologies led to the emergence of digital leadership.

Affan defines digital leadership as the practice of conducting administrative responsibilities online via the use of digital and information communication technology.[14] Moreover, digital leadership, according to Al-Rayes and Al-Aifan, is an approachable leadership style that combines the capacity to effect change with the strategic use of digital resources in schools, enabling school leadership to achieve the goals of digital transformation in education effectively.[15] Digital leadership is a new leadership style tailored toward digital transformation within an organization, which allows organizations to digitize their environments to maintain a competitive edge.[16] Newer technologies often require a drastic shift, disrupting the status quo and conventional operating practices. This calls for newer management, competencies, and organizational and inter-organizational structures.[17] Digital leadership is a novel and modern practice that emerged on digital technologies' bedrock. It is a revolutionary phenomenon that has redefined and still redefining school administration. The digital

[11] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[12] V. Venkatraman, "The Digital Matrix ," 2017, https://ciodevelopment-cdn-1.s3.eu-west-2.amazonaws.com/wp-content/uploads/2017/10/06082031/Venkat-Digital-Matrix-Booklet.pdf.
[13] Abdullah bin Taher Al-Ashmawi and K. bin M Al-Osaimi, " Electronic Leadership and Its Relationship to Digital Awareness among Secondary School Leaders in Taif from the Teachers' Point of View," *Journal of Young Researchers* 9 (2021): 526–66.
[14] Mohammad Affan, "Requirements for Digital Leadership Implementation in Indonesian Embassy's Schools in Saudi Arabia in Accordance with ISTE Standards," *JHS*, no. 33 (2024): 165–86.
[15] Al-Rayes and Al-Aifan, " Professional Development Needs for School Leaders in the Kingdom of Saudi Arabia in Light of Digital Leadership ."
[16] John Olayemi Okunlola, Suraiya Rathankoomar Naicker, and Chinaza Uleanya, "Digital Leadership in the Fourth Industrial Revolution Enacted during the COVID-19 Pandemic: A Systematic Review," *Cogent Education* 11, no. 1 (December 31, 2024), https://doi.org/10.1080/2331186X.2024.2317258; F. Sagbasi, M & Erdogan, *Digital Leadership: A Systematic Conceptual Review* (İstanbul Kent Üniversitesi İnsan ve Toplum Bilimleri Dergisi, 2022).
[17] Tangi et al., "Barriers and Drivers of Digital Transformation in Public Organizations: Results from a Survey in the Netherlands"; Mete Yildiz, "E-Government Research: Reviewing the Literature, Limitations, and Ways Forward," *Government Information Quarterly* 24, no. 3 (2007): 646–65.

leadership practice is phenomenal, and that does not solicit for forceful adoption, but its force of change can make uncooperative organizations to be irrelevant and redundant.

Barriers to Digital Leadership

Digital technologies offer improved service delivery and public administration, but traditional conventions, bureaucracy, procedures, and structure often hinder their fulfillment.[18] However, there are difficulties in implementing digital leadership in school management. Some common challenges have been noted, including resistance to change, a lack of digital literacy among educators and leaders, financial limitations, and the requirement for continual professional development.[19] Meanwhile, the emergence of digital tools in organizational management is seen as mere dematerialization, where the physical mode is replaced by the digital mode.[20] Hence, surmounting the challenges of digital leadership is more than changing leadership styles and strategies. It is not just efforts towards dematerialization to keep pace with trends; rather, it should be deliberate, strategic, and calculated efforts geared towards leveraging digital tools to inspire the led and create a competitive edge demanded in the digital age.

Ahmad examined the obstacles that female principals of secondary schools in the Qasabah Irbid District encountered when implementing digital leadership.[21] Data were gathered using a questionnaire of 20 items and a descriptive survey approach. A convenient random sampling procedure was used to choose 135 female principals who made up the study's sample. High scores were found for mathematical, human, technological, and organizational barriers. There were no discernible variations in the number of courses taken, years of experience in school administration, or academic credentials. The study recommends providing principals and teachers with training on digital leadership applications for technical and administrative coursework. The results point to the need for better tactics in digital leadership. In another related study, Tsai et al. examined the drivers, challenges, and opportunities of complexity leadership in learning analytics in 21 UK higher education institutions.[22] It revealed resource distribution, stakeholder support, ethics, and privacy difficulties.

Zulu et al. conducted a study on barriers undermining effective transformation in digital leadership enactment in the construction industry and revealed that the construction industry is lagging in embracing digital transformation because of problems with competent leadership.[23] The study employed a qualitative approach and interviewed 38 experts as participants to unveil the obstacles to the industry's adoption of digital leadership. The study identified barriers to digital leadership enactment and grouped them under five themes: risk perceptions, technology concerns, management and organizational issues, and leadership challenges. Noor et al. equally revealed that the digital divide has affected the potential advantages of telecommuting, e-commerce, healthcare information, and online and remote learning for kids.[24] In addition to coverage, demand-side obstacles, including low

[18] J. Dunleavy et al., "New Public Management Is Dead - Long Live Digital-Era Governance," *J. Public Adm. Res. Theor.* 16, no. 3 (2006): 467–494; P. Margetts, H. & Dunleavy, "The Second Wave of Digital-Era Governance: A Quasi-Paradigm for Government on the Web. Philos. Trans. R. Soc. A Math. Phys. Eng. Sci. 371(1987)," 2013; Janja Nograšek and Mirko Vintar, "E-Government and Organisational Transformation of Government: Black Box Revisited?," *Government Information Quarterly* 31, no. 1 (2014): 108–18; Tangi, L., Janssen, M., Benedetti, M., and Noci, "Barriers and Drivers of Digital Transformation in Public Organizations: Results from a Survey in the Netherlands."

[19] Ahmad Fadhly Arham et al., "Digital Leadership in Education: A Meta-Analysis Review," in *International Conference on Business and Technology* (Springer, 2022), 849–57; D. Ridho et al. , "Digital Leadership in the Scope of Education. Proceedings of the International Conference on Educational Management and Technology (ICEMT 2022) (Pp.52-61). Atlantis Press SARL.," 2023, https://doi.org/https://doi.org/10.2991/978-2-494069-95-4_7.

[20] Tangi et al., "Barriers and Drivers of Digital Transformation in Public Organizations: Results from a Survey in the Netherlands."

[21] N. A. L. Ahmad, "The Obstacles of Applying Digital Leadership from the Perspectives of Female Secondary School Principals at Qasabah Irbid District," *International Journal of Educational and Psychological Studies* 11, no. 3 (2022): 498–517.

[22] Yi-Shan Tsai et al., "Complexity Leadership in Learning Analytics: Drivers, Challenges and Opportunities," *British Journal of Educational Technology* 50, no. 6 (November 16, 2019): 2839–54, https://doi.org/10.1111/bjet.12846.

[23] M. Zulu et al., "Digital Leadership Enactment in the Construction Industry: Barriers Undermining Effective Transformation. Engineering, Construction and Architectural Management. ISSN 0969-9988 DOI: Https://Doi.Org/10.1108/ECAM- 05-2022-0491," 2023.

[24] Tanya Kane et al., "Dementia Caregiving in the Middle East and North Africa: A Scoping Review," *Transcultural Psychiatry* 58, no. 6 (December 19, 2021): 844–58, https://doi.org/10.1177/13634615211036404.

price and low digital literacy, have become crucial. While internet usage is quite strong in cities, the digital economy still has infrastructural issues that make it difficult for organizations nationwide, especially in suburban and rural areas.

In a study by Gupta on organizational barriers to digital transformation, eleven executives from various companies were interviewed as participants to better understand their experiences with digital transformation.[25] Several obstacles were identified: unclear company vision, top management style, project group setup, insufficient knowledge, a shortage of rewards and incentives, ambiguous measurement systems, a lack of human resource involvement, and a strong learning culture. It was also revealed that organizations are undergoing a digital revolution and must move fast to remain competitive.

Drivers to Digital Leadership

Digital transformation allows organizations to innovate by changing organizational structure, technology platforms, operations, services, and workplace locations.[26] Meanwhile, in achieving digital innovation, top management support is essential for fostering an atmosphere that nurtures it. [27] This was also corroborated by Zulu & Khosrowshahi that digital leadership is critical in driving digital innovation.[28] Meanwhile, Kane et al. contended that leadership-related factors are more vital than technological issues in the digital transformation era. [29] Hence, strong leaders are essential to organizations as they try to find their footing in a volatile business climate. Cortellazzo et al. also recognized that leaders are important players in forming a digital culture inside an organization, acknowledging the crucial role that leadership plays in this process.[30] However, leadership style is critical in driving digital transformation, and digital leadership is suitable because it possesses leadership attributes such as transformational and transactional leadership styles and emotional intelligence, which are closely associated with digital leadership practices. [31] This was also corroborated by who investigated how a leader's style affected an organization's digital transformation and reported in their findings that leadership style significantly influenced organizational transformation and played a critical role in the success of the change effort.[32]

Kane et al. submitted that it takes a robust digital strategy backed by leaders who foster a creative and adaptable culture to successfully restructure organizations digitally.[33] Thus, technology may be pivotal in digital transformation, but more important is the driving strategy; as opined by Kane et al., digital leaders stand out from the crowd because they have a well-defined digital strategy, a supportive culture, and leadership that can spearhead change.[34] In addition, the process of digital transformation thus calls for a leader who can design and oversee a radical change strategy, as opposed to just digitizing organizational tasks or incorporating new digital technology into the organizational framework.[35] This indicates that strategy is more fundamental than technology. Strategy drives digital leadership, and without it, digital technology means nothing. Some elements of the strategy that drive digital leadership in the age of transformation, as identified by Sagbasi & Erdogan, including

[25] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[26] Omar A El Sawy et al., "How LEGO Built the Foundations and Enterprise Capabilities for Digital Leadership," in *Strategic Information Management* (Routledge, 2020), 174–201.
[27] Elenkov, D.S. and Manev, I.M., "Top Management Leadership and Influence on Innovation: The Role of Sociocultural Context," *Journal of Management* 31, no. 3 (2005): 381–402.
[28] Zulu and Khosrowshahi, "A Taxonomy of Digital Leadership in the Construction Industry."
[29] Gerald C Kane et al., "How Digital Leadership Is (n't) Different," *MIT Sloan Management Review* 60, no. 3 (2019): 34–39.
[30] Laura Cortellazzo, Elena Bruni, and Rita Zampieri, "The Role of Leadership in a Digitalized World: A Review," *Frontiers in Psychology* 10 (2019): 1938.
[31] Hussain Aldawood et al., "Integrating Digital Leadership in an Educational Supervision Context: A Critical Appraisal," in *2019 International Conference in Engineering Applications (ICEA)* (IEEE, 2019), 1–7.
[32] S. Sow, M. and Aborbie, "Impact of Leadership on Digital Transformation," *Business and Economic Research* 8, no. 3 (2018): 139–148.
[33] Gerald C Kane et al., "Is Your Business Ready for a Digital Future?," *MIT Sloan Management Review* 56, no. 4 (2015): 37.
[34] Kane et al., "Is Your Business Ready for a Digital Future?"
[35] İ. Yıkılmaz and L. Sürücü, "Dijital Çağda Liderliğin Yeni Yüzü: Dijital Liderlik," *Dijital Gelecek Dijital Dönüşüm-2, İstanbul: Efe Akademi*, 2021, 301–17.

intellectual stimulation, passion, vision, bravery, inspiration, strategic thinking, focus, creativity, adaptability, emotional and spiritual intelligence, technology, responsibilities, entrepreneurial ideas, and critical thinking.[36]

Furthermore, to surmount the obstacles linked with digital transformation, leaders need to cultivate a combination of digital and human proficiencies, chiefly the capacity for conversation proficiently in a digitalized milieu, promote collaboration among geographically separated subordinates, stimulate proactivity, and modify perspectives.[37] The role of communication in a digital environment is crucial for the effective dissemination of educational issues that affect the operation of school organizations. It should be noted that adequate communication builds trust and confidence, and if a gap is created, it breeds mistrust. Hence, school leaders who act as digital leaders must leverage digital tools to communicate effectively. In addition, Augustina et al. argued that an individual who will drive digital leadership in the school environment must be a visionary individual who demonstrates digital citizenship, professional growth, a digital-age learning culture, and systematic improvement.[38]

Theoretical Model - Lewin Three-Step Model of Change

Lewin's Three Phase model is one of the most influential early models and has attracted much attention.[39] It serves as the foundation for numerous change management theories, models, and business change management strategies.[40] Most organizations use Lewin's organizational change theory for significant change initiatives. It was first presented in the middle of the 20th century and is often cited and applied in change management. Despite the change process's complexity, organizations adopt the widely used change management model, which is perceived as a sequential linear process for identifying opposition and promoting transformation.[41] The change phenomenon in an organization has been associated with leadership style, and several studies have demonstrated that leadership is essential in the change process.[42] Digital leadership practice represents a change in the age of digitization. This change is still new and odd to the traditional leadership styles' practitioners, hence, aversion to this transformative leadership style heralded by digital technologies. The issue of leadership is fundamental when implementing change, and management should pay close attention to the leadership style.[43] Traditional leadership approaches are more challenging to deal with in terms of complexity and rapidly increasing competitiveness. Instead, leaders must use new management styles that involve taking opportunities, accepting uncertainty, and making choices more quickly. Lewin recognized the three stages of change depicted in Figure 1:

[36] Sagbasi & Erdogan, *Digital Leadership: A Systematic Conceptual Review*.
[37] Cortellazzo, Bruni, and Zampieri, "The Role of Leadership in a Digitalized World: A Review."
[38] S. Augustina et al., "Leadership Selection at Vocational Education Based on Digital Leadership Model Using AHP Method," in *2020 4th International Conference on Vocational Education and Training (ICO*, 2020.
[39] Kurt Lewin, "Group Decision and Social Change," *Readings in Social Psychology* 3, no. 1 (1947): 197–211; Lewin, *Field Theory of Social Science: Selected Theoretical Papers*.
[40] Bernard Burnes, "No Such Thing as … a 'One Best Way' to Manage Organizational Change," *Management Decision* 34, no. 10 (December 1, 1996): 11–18, https://doi.org/10.1108/00251749610150649; Shikha Gupta, "Organizational Barriers to Digital Transformation," 2018.
[41] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[42] Syed Talib Hussain et al., "Kurt Lewin's Change Model: A Critical Review of the Role of Leadership and Employee Involvement in Organizational Change," *Journal of Innovation & Knowledge* 3, no. 3 (September 2018): 123–27, https://doi.org/10.1016/j.jik.2016.07.002.
[43] Hussain et al., "Kurt Lewin's Change Model: A Critical Review of the Role of Leadership and Employee Involvement in Organizational Change."

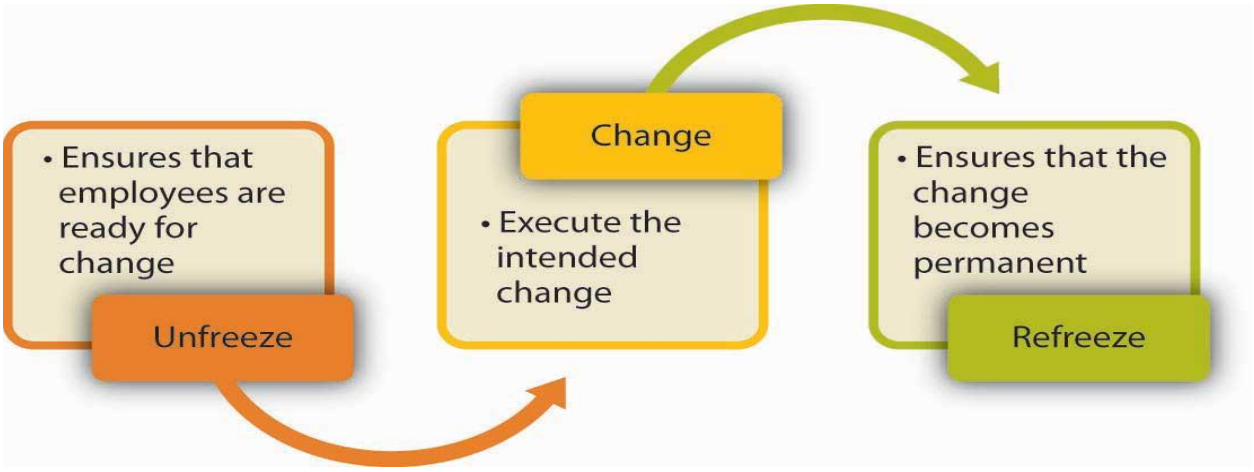

Figure 1: Lewin's Three Stages Change Management Model- Source [44]

Unfreeze: This is the most crucial stage since most individuals find it difficult to accept change. It is a time of thawing or unfreezing that has to be started with sufficient planning and inspiration.[45]

Change/ Transition: This is the next phase, where, once the change has been implemented and the transition period has passed, there will likely be resistance to the change. This needs to be addressed with sufficient assurance because members of the organization are now adopting new working methods, and the success of this phase of the process depends on leadership, support, and communication [46]

Refreeze: The last stage, which denotes stability, occurs after a change is effectively implemented and accepted; at this point, the personnel has been refrozen, and the organization is operating under new policies.[47]

Moreover, the study by Cummings and Worley (2003) further presents five essential leadership actions in the change process.[48] The stages of change that are being considered are the unfreezing state of the organization, the motivating change and vision creation, the moving stage of the change and its implementation, the refreezing state of the change and its implementation, the development of political support, and the management of the transition. Gupta offers an instructive explanation and practical application of Lewin's model in organizational change as the force field analysis, demonstrating how the forces that drive and oppose change in each environment occur.[49] Lewin observes that every stage has two competing forces: driving and resisting change.

In the context of this study, the barriers are the opposing forces resisting change as presented by digital leadership practices. At the same time, the drivers are the forces pushing for change due to the emergence of digital technologies. In school organizations, high school leaders, principals, administrators, and teachers may be averse to change due to the status quo. ''The idea underlying these driving factors is that in any particular circumstance, the driving forces must be much more than the opposing forces for change to be implemented successfully.[50] Hence, it is imperative in today's transformative era for school leaders in the context of this study to ensure that change is sustained and accepted and that personnel do not go back to their pre-change approaches. If not, the absence of digital

[44] Lewin, *Field Theory of Social Science: Selected Theoretical Papers*.
[45] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[46] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[47] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[48] T.G.Cummings & C.G.Worley. *Organization development and change* (8th ed.,) (Melissa S. Acuna, 2003).
[49] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[50] Gupta, "Organizational Barriers to Digital Transformation," 2018.

leaders with adaptable leadership styles and mindsets can significantly impact the process of change and transformation.[51]

METHODOLOGY

Research Design

This study used a quantitative research approach to investigate high school leaders' experiences on drivers and barriers of digital leadership practice in high schools. The descriptive research design was employed for the study.

Sampling and Sampling Procedure

A multi-stage sampling technique was used to select high school leaders, which comprised principals, vice-principals, and heads of departments from Oyo State High Schools. Two hundred and twenty respondents, including 11 principals, 30 vice-principals, and 179 heads of department, completed and returned the questionnaire.

Instrumentation

The two structured questionnaires titled Barriers of Digital Leadership Questionnaire (BDLQ) and Drivers of Digital Leadership Questionnaire (DDLQ) were used for data collection, containing sections A, B, and C. Section A contained respondents' demographic data. In contrast, sections B and C comprise 20 items for the study to obtain data on barriers and drivers of digital leadership.

Educational leadership, management, and test measurement experts were consulted to determine the instrument's content validity. Their recommendations were incorporated into the final instrument administered to the respondents. The instrument's reliability was ascertained through Cronbach Alpha (α) to measure the internal consistency among the items.[52] The reliability index obtained is as follows: barriers of digital leadership (α =0.92) and drivers of digital leadership (α =0.93) at 0.05 significance level.

Ethical Consideration

The study complied with all ethical requirements. The researcher also obtained permission from the principals of all high schools used for the study in Oyo State, Nigeria. The researcher sought respondents' consent and took the time to explain to them what the study entailed and its benefits to the participants, the government, and society. In addition, the anonymity of the respondents was carefully maintained.

Data Analysis

This study employed descriptive statistics to analyze the research questions and the respondents' socio-demographic information. These include simple percentages, means, and standard deviations. Descriptive statistics proved to be a valuable tool in summarizing, displaying, and understandably presenting complex data.

PRESENTATION OF RESULTS

The socio-demographic characteristics of the school leaders who participated in this study showed that 53.2% of the participants were females, while 46.8% were males. Also, 81.4% of the school leaders sampled were Heads of Departments (HODs), 13.6% were Vice Principals, and 5.0% were Principals. More so, 41.4% of the participants were within the age range of 41 – 50years; 21.4% were within 21 – 30years of age; 20.5% were between 51 – 60years of age while 16.8% of the school leaders sampled were within the age range of 31 – 40years. In addition, 70.9% of the school leaders bagged a Bachelor's Degree, 14.1% were Master's degree holders, 10.0% were NCE holders, and 5.0% bagged other educational qualifications. Furthermore, 25.5% of the school leaders were within 0 – 5 years of

[51] David Kiron et al., "Aligning the Organization for Its Digital Future," *MIT Sloan Management Review* 58, no. 1 (2016).
[52] Cohen, L. Manion et al., *Research Methods in Education*.

experience; 22.7% had 21years and above experience; 22.3% were within 16 – 20 years of experience; 18.6% were within 10 – 15 years of experience; while 10.9% were within 16 – 20years of experience.

Research Question 1:
What barriers do high school leaders face in leveraging digital technologies to enhance digital leadership practices?

Participants' responses on barriers to digital leadership practice were subjected to item-by-item analysis using mean statistics. Given that the questionnaire items were structured in a four-response type, a cut-off mean value of 2.50 was used as the baseline for the decision. Thus, items with a mean score equal to or above 2.50 were affirmed, while those with a mean score below 2.50 were disaffirmed. The statistics of participants' responses are shown in Table 1.

Table 1: Descriptive statistics of Barriers to digital leadership practice among high school leaders

SN	Items	Mean	S. D	Remark
1	Inadequate training	3.10	0.79	Affirmed
2	Resistance to change to digital innovation	3.01	0.71	Affirmed
3	Difficulties in using digital tools	3.00	0.82	Affirmed
4	Lack of funds and support	3.26	0.74	Affirmed
5	Unclear benefits of using digital tools	2.85	0.85	Affirmed
6	Current leadership responsibilities	2.90	0.77	Affirmed
7	School organizational culture	2.88	0.77	Affirmed
8	Established leadership practices	2.86	0.72	Affirmed
9	Fear of data security and privacy	2.84	0.88	Affirmed
10	Complexity in implementation	2.86	0.77	Affirmed
11	The challenge of the digital gap among teachers	2.96	0.74	Affirmed

As indicated in Table 1, the barriers to digital leadership practice among high school leaders are inadequate training, resistance to change to digital innovation, difficulties in using digital tools, lack of funds and support; unclear benefits of using digital tools, current leadership responsibilities; school organizational culture; established leadership practices; fear of data security and privacy; complexity in implementation and the challenge of the digital gap among teachers. The results from Table 1 also show that all eleven items on barriers to digital leadership practice obtained mean scores above the 2.50 cut-off mean value, confirming the existence of these barriers.

Research Question 2:
What key drivers propel high school leaders to engage in digital leadership practices in their school environment?
School leaders' responses on what drives digital leadership practice were subjected to item-by-item analysis using mean statistics. Given that the questionnaire items were structured in a four-response type, a cut-off mean value of 2.50 was used as the baseline for the decision. Thus, items with a mean score equal to or above 2.50 were affirmed, while those with a mean score below 2.50 were disaffirmed. The statistics of participants' responses are shown in Table 2.

Table 2: Descriptive statistics of Drivers of digital leadership practice among school leaders

SN	Items	Mean	S. D	Remark
1	Culture of technology awareness and proficiency in other schools.	3.12	0.661	Affirmed

2	Enhancement of communication among school stakeholders	3.20	0.520	Affirmed
3	Technological trends in school leadership and management	3.04	0.701	Affirmed
4	Digital practices enhance the school's positive image	3.23	0.673	Affirmed
5	Improved student learning outcomes	3.05	0.701	Affirmed
6	Ease of administrative processes	3.26	0.605	Affirmed
7	Response to tech-savvy students' expectations	3.25	0.640	Affirmed
8	Preparation for a technology-driven future	3.25	0.659	Affirmed
9	Fostering innovation in school leadership and management	3.03	0.672	Affirmed

As revealed in Table 2, the drivers of digital leadership practice among school leaders are a culture of technology awareness and proficiency in other schools, enhancement of communication among school stakeholders, and technological trends in school leadership and management; digital practices enhance the school's positive image; improved student learning outcomes; ease of administrative processes; response to tech-savvy students' expectations; preparation for a technology-driven future; and fostering of innovation in school leadership and management. The results from Table 2 indicate that all nine items on drivers of digital leadership practice obtained mean scores above the 2.50 cut-off mean value, confirming the influence of these drivers on digital leadership practice.

DISCUSSION OF FINDINGS

The first research question of this study investigated the barriers faced by high school leaders in leveraging digital technologies to enhance digital leadership practices. The findings indicated barriers high school leaders encountered in practicing digital leadership, including inadequate training, resistance to change, difficulties with digital technologies, lack of funding, unclear benefits, organizational culture, and data security concerns. In order to determine the barriers to digital leadership among high school leaders, the study employed a cut-off mean value of 2.5. Items that scored less than 2.50 were disaffirmed, while those that scored more than 2.50 were affirmed. Based on the results in Table 1, each of the eleven items of barriers to digital leadership practice obtained average scores above the threshold of 2.50%, confirming their significance as barriers. This present study is in agreement with Gupta, who studied organizational barriers to digital transformation and identified obstacles, which include unclear company vision, top management style, project group setup, insufficient experience, a shortage of rewards and incentives, ambiguous measurement systems, a lack of human resource involvement, and a strong learning culture.[53]

The findings of Arham et al. and Ridho et al. equally align with this study, establishing that there are difficulties in implementing digital leadership in school management, which are resistance to change, a lack of digital literacy among educators and leaders, financial limitations, and the requirement for continual professional development. [54] The reports of Ahmad on the human, technological, and organizational barriers that female principals of secondary schools in the Qasabah Irbid District encountered when implementing digital leadership also attested to this present study's findings.[55] Tsai et al. is another related study that supports this present study by revealing that resource distribution, stakeholder support, ethics, and privacy difficulties are part of the challenges of complex leadership in UK higher education institutions. [56]

[53] Gupta, "Organizational Barriers to Digital Transformation," 2018.
[54] Arham et al., "Digital Leadership in Education: A Meta-Analysis Review"; Muhammad Rasyid Ridho et al., "Digital Leadership in the Scope of Education," in *Proceedings of the International Conference on Educational Management and Technology (ICEMT 2022)* (Paris: Atlantis Press SARL, 2023), 52–61, https://doi.org/10.2991/978-2-494069-95-4_7.
[55] Ahmad, "The Obstacles of Applying Digital Leadership from the Perspectives of Female Secondary School Principals at Qasabah Irbid District."
[56] Tsai et al., "Complexity Leadership in Learning Analytics: Drivers, Challenges and Opportunities."

The second research question examined key drivers that propelled high school leaders to engage in digital leadership practices in their school environment. A cut-off mean value of 2.50 was used in the study to assess the factors influencing high school leaders' application of digital leadership practices. Nine elements were confirmed as drivers: a culture of technology awareness and proficiency in other schools, enhancement of communication among school stakeholders, and technological trends in school leadership and management; digital practices enhance the school's positive image; improved student learning outcomes; ease of administrative processes; response to tech-savvy students' expectations; preparation for a technology-driven future; and fostering of innovation in school leadership and management. In this analysis of the drivers of digital leadership practice among school leaders, a cut-off mean value of 2.50 was used as the baseline for decision-making. Items with a mean score equal to or above 2.50 were affirmed, indicating a consensus among participants regarding the significance of these drivers, while items with a mean score of 2.50 were disaffirmed.

According to the findings presented in Table 2, all nine items regarding the drivers of digital leadership practice received mean scores above the cut-off value of 2.50, thus affirming their importance as drivers. Therefore, this study agrees with Augustina et al, who identified that an individual who will drive digital leadership in the school environment should demonstrate digital citizenship, professional growth, a digital-age learning culture, vision, and systematic improvement. The study of Cortellazzo also affirmed the present study's findings by recognizing that leaders are important players that drive the formation of a digital culture inside an organization.[57] Kane align with this study and assert that it takes a strong digital strategy backed by leaders who foster a creative and adaptable culture to restructure organizations digitally.[58] This suggests that what drives digital leadership practices is not only technological but also strategic, which chiefly plays a pivotal role. These include items of drivers of digital leadership such as enhancement of communication among school stakeholders, technological trends in school leadership and management, enhancement of school's positive image, improved student learning outcomes, ease of administrative processes, response to tech-savvy students' expectations; preparation for a technology-driven future; and fostering of innovation in school leadership and management.

RECOMMENDATIONS

Based on the findings and discussion, the following recommendations are made:

- High school leaders should prioritize continuous professional development to improve their leadership skills, digital literacy, and capacity to adjust to new technological advancements.
- School leaders must also recognize and address barriers to digital leadership, such as budgetary limitations, lack of digital proficiency, and reluctance to change.
- Schools must create a climate that encourages creativity, experimentation, and teamwork.
- High school administrators and leaders must create a clear digital strategy that aligns with the school's vision and goals to ensure that digital initiatives are successful.
- Encouraging and promoting cooperation and collaboration among educators, administrators, students, and parents is essential in cultivating a collective sense of ownership and responsibility for digital leadership efforts.

CONCLUSION

Technological advances have brought about significant changes in education, especially in this age of digital transformation. Considering the responsibility of understanding the opportunities and challenges posed by digital leadership practices, high school leaders are at the vanguard of this digital growth. It is now essential that organizations embrace digital technology to drive organizational transformation and improve efficiency as they fight to be relevant and competitive in the digital age. Hence, this study investigated the barriers and drivers influencing high school leaders' adoption of

[57] Cortellazzo, Bruni, and Zampieri, "The Role of Leadership in a Digitalized World: A Review."
[58] Kane et al., "Is Your Business Ready for a Digital Future?"

digital technologies for digital leadership practices. Therefore, this study's findings revealed that several barriers, such as insufficient training, reluctance to adapt, and budgetary limitations, prevent the seamless integration of digital technologies. Despite these obstacles, leaders are nonetheless being propelled toward adopting digital leadership for various reasons, including enhancing communication, raising student achievement, and becoming ready for the future of technology. The statement highlights the crucial function of leadership in cultivating an innovative culture, utilizing digital tools for strategic decision-making, and propelling substantial transformations in academic organizations. It is noteworthy that this study has offered valuable insights into the complexity of digital leadership in high school settings by examining the literature and empirical data. This study has affirmed that strengthening digital leadership drivers has become more important to successfully navigate the challenges of digital transformation.

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