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Deconstructing leadership in the post-industrial era: A comparative study of traditional leadership styles and digital leadership practices in high schools

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ABSTRACT

Leadership in high schools is undergoing a transformative shift as educational institutions adapt to the digital age. This study investigates the evolution of leadership styles from traditional to digital paradigms within the context of high schools. It examines how traditional leadership styles characterized by hierarchical authority and structured decision-making contrast with digital leadership practices, emphasizing technological integration, collaboration, and adaptability. The Complex Leadership Theory (CTL) serves as the theoretical foundation for the study. The study employed a correlation research design with a multi-stage sampling of 231 high school leaders in Oyo State, Nigeria, through structured questionnaires assessing their perceptions of traditional and digital leadership approaches. Two research questions were raised, and two hypotheses were formulated. Findings revealed traditional leadership's emphasis on structure and authority while acknowledging its limitations in fostering innovation and collaboration. In contrast, digital leadership practices were perceived as more effective in navigating the complexities of modern educational environments, with a strong focus on technological advancement and team-based approaches. The study finds a significant relationship between traditional and digital leadership styles, suggesting that elements of both can coexist effectively. The study concludes that integrating traditional and digital leadership could offer a balanced and responsive approach to contemporary educational leadership challenges.

Keywords: Traditional leadership, Digital leadership, Post-industrial Era, Leadership styles, High schools

INRODUCTION

Leadership paradigms have shifted from hierarchical models to adaptive approaches in response to technological change. This is attributed to leadership style, which continues to evolve as the era changes (Bach and Sulíková, 2021; Manga, 2023). Leadership style was described by Anderson and Sun (2017) as a leader's recurring attitude and behavior. Nanjundeswaraswamy and Swamy (2014) also described leadership style as the constant actions of a leader, emphasizing that this behavior affects an organization's performance and effectiveness and plays a role in its success or failure.

Meanwhile, several decades have witnessed the evolution of leadership paradigms. The industrial era's leadership was clearly defined by the relationships between employers and employees, managers and subordinates, masters and slaves, and leaders and followers (Clark & Lipset, 2001; Malakyan, 2020; Rost, 1993). Leadership in the industrial era modeled traditional leadership styles, as shown in the 'authority relationship' of master-slave and manager-subordinate. Many organizations accorded a top priority to control over collaboration since the leader-follower interactions of this era reflect a mostly top-down approach that silences follower voices. The traditional

leadership styles, such as autocratic, bureaucratic, and charismatic, reinforce this hierarchy by centralizing authority, while democratic leadership encourages participatory decision-making, Laissez-Faire (liberal) minimizes direct oversight (Rizvi, 2022; Souza & Pietrafesa, 2023).

However, the world has changed since the turn of the twenty-first Century, and leader-follower interactions have improved because followers have become more confident in assuming leadership roles in the post-industrial age (Malakyan, 2020). The current era, which is regarded as post-industrial, demonstrates a bottom-up style that affords the entire workforce in the organization a voice; as Bolden (2011) revealed, the contemporary leadership paradigm has shifted from leader-centered to follower-inclusive and relational leader-follower models. Thus, in the post-industrial era, followers felt more confident to assume leadership roles and strengthen their bonds with leaders (Malakyan, 2020). The leadership style in the digital age is based on distributed and decentralized decision-making (Karakose et al., 2021). Digital leadership places more emphasis on teamwork and collaboration, whereas traditional leadership promotes independence and autonomy (Rizvi, 2022). Mihardjo et al. (2019) emphasize that digital leadership uses digital technologies and transformative leadership styles to blend digital competency and culture. Hence, in the digital era, a digital leader must demonstrate transformational leadership that drives innovation, change, and vision (Ming & Mansor, 2024).

In addition, the emergence of the digital era was a defining moment that has brought about significant changes in several fields, including education, where technology integration has reshaped traditional practices and introduced a new leadership paradigm. Recently, the workplace has become more digital due to technological advancements, making remote work possible, which has caused a shift in leadership from traditional to digital (Erhan et al., 2022). Hence, organizational dynamics have irrevocably changed due to digital technology, posing new challenges that leaders must confront head-on (Cortellazzo et al., 2019). Digital advances have significantly affected high school education, which calls for assessing the leadership paradigm. To create environments that support 21st-century learning, educators, principals, administrators, and policymakers must thus understand the taxonomy and transition of leadership in this changing era.

However, given the unpredictable nature of the future, decision-makers are debating whether, in the digital era, leadership transition will become less critical as daily management gets more technical or if it even has to be wholly redesigned (Gilli et al., 2024). Hence, new leadership in the current era requires keeping up with technological advancements and learning about recent modifications to organizational structures (Erhan et al., 2022). It is worthy of note that leadership in the digital age employs digital leadership as an umbrella term for several leadership styles, which include technology leadership, virtual leadership, e-leadership, and leadership 4.0, which is mediated by contemporary information technologies to enhance organizational performance (Karakose et al., 2022).

In light of the Fourth Industrial Revolution (4IR), schools need to adapt and evolve. Many reports in the field of leadership in schools show that little or no change has taken place in leadership styles. Or after COVID, in the field of school leadership, there has been a shift in the types of leaders. Consequently, leadership is fundamental in achieving the learning outcomes of schools. For schools to succeed in the digital age, those still operating traditional systems may need to ensure that their leadership and management align with current reality. They must adjust by fusing new ideas with current experiences or experimenting with various leadership philosophies based on willingness, knowledge, and organizational culture. Hence, traditional leadership philosophies might not be appropriate for the administration of schools in recent times (Seleari, 2021). In the same vein, Franco (2020) argued that to lead more effectively in the digital age, leaders must modify their current styles and adopt new ones by incorporating digital tools, as school administration is no exception.

Despite the growing body of research on leadership in education, there is a notable gap regarding the interplay between traditional leadership styles and digital leadership practices within the high school context. Most existing studies on leadership tend to focus mainly on traditional or digital leadership, with less attention devoted to their intersections. This study examined the relationship between traditional leadership styles and digital leadership practices among high school leaders in selected high schools in Oyo State, Nigeria. This is because previous studies have shown that digital leadership practices are low among high school leaders in Nigeria. To achieve this research objective, two research questions were raised, and two hypotheses were formulated.

The research questions are:

1. What are the high school leaders' perceptions of traditional leadership styles?
2. How do high school leaders perceive digital leadership practices?

The hypotheses are:

1. Hypothesis 1: There is no significant relationship between traditional leadership styles and digital leadership practices.
2. Hypothesis 2: There is no significant difference between traditional leadership styles and digital leadership practices.

LITERATURE REVIEW

Traditional Leadership Styles

The term "traditional leadership" refers to leadership that emerged in either a rapidly evolving or a traditional society. The foundation of traditional leadership is the acceptance of the legitimacy of the position of power under long-standing customs and the sanctity of prevailing customs (Yusup, 2022; Steeves et al., 2025). In 1938, the Iowa Studies of Leadership examined traditional leadership approaches and conducted experiments investigating three distinct leadership styles: democratic, autocratic, and Laissez-faire. Lewin collaborated with Lippitt and White to determine how various leadership philosophies may affect individuals' contentment, resentment, and annoyance levels (Makhdoom et al., 2021). The three leadership styles identified are as follows:

Democratic Leadership Style

The democratic leadership style prioritizes respect for one another, fosters collective decision-making, and enhances the master-master bond between leaders and team members (Lewin et al., 1939). This is also corroborated by (Demir et al., 2010; Kiyak & Bozkurt, 2020), who state that democratic leadership encourages participation from all group members and gives them the authority to make more significant contributions. It is a participatory leadership style where followers are more actively involved in the formulation and execution of decisions while the leader offers complete guidance and oversight (Makhdoom et al., 2021).

Autocratic Leadership Style

It is an authoritative leadership style where an individual takes the lead and makes all decisions without consulting followers. Only the leader's viewpoints and perspectives are used to make decisions (Makhdoom et al., 2021). The antithesis of the democratic leadership style is the autocratic leadership style. The boss and the followers are encouraged to have a master-servant relationship under an autocratic leadership style. Leaders exercise total control over the group, making all the decisions and dictating what must be done to each member (Lewin et al., 1939; Seleari, 2021).

Laissez-faire leadership Style

A laissez-faire approach denotes a lack of authority or control. The group can decide how to proceed and finish tasks independently (Kiyak & Bozkurt, 2020). In this delegating leadership style, the leader assumes a more supportive role and lets followers make their judgments (Makhdoom et al., 2021). This leadership style does not encourage using authority to achieve its goals. It is a delegating leadership approach in which followers are saddled with the responsibilities of carrying out functions without directions and guidance.

Digital Leadership Practices

The emergence of new technology has given birth to a more diverse variety of leadership responsibilities, demanding a new set of skills and capabilities from leaders. Hence, to properly manage staff in the digital era, leaders must adjust to new technology and communication methods (Şişu, 2023). The application of digital tools in a virtual environment is what Narbona (2016) terms "digital leadership." In addition, digital leadership is a new kind geared towards an organization's digital transition. It helps organizations digitize their surroundings to stay competitive (Sagbasi & Erdogan, 2022). Digital leadership uses technology to motivate and inspire employees (Zhong, 2017). Management's appropriate actions to guide an organization's digital transformation are referred to as digital leadership (El Sawy et al., 2016). The International Society for Technology in Education (ISTE) recommends the standard attributes expected of a digital leader, such as visionary leadership, a digital age learning culture, excellence in professional practice, systemic improvement, and digital citizenship.

Consequently, technological advancements have evolved into leadership in education. Leadership has changed in the modern day, and school administrators must embrace digital tools to provide instruction in the digital age. They must exhibit leadership qualities centered on digital technologies (Hamzah et al., 2021; Okunlola et al., 2024; Yusof et al., 2019). Hence, digital leadership in education is defined as applying instructional technology to manage digital organization, manage digital citizenship, promote professional development, inspire transformation, and build a culture of digital learning (Zhong, 2017). School leaders should prepare by adjusting their leadership style to fit the present reality (Zhao, 2020). School leaders must also provide technology-focused leadership, as isolating from the current reality may be counterproductive to leadership and learning outcomes. De Waal et al. (2016) equally revealed that when employees use digital technology (a range of contemporary tools that support education,

administration of schools, and teaching and learning) to execute their jobs, they exhibit digital leadership, which has transformational leadership attributes. The study's findings by Mustofa and Cahyono (2022) in Indonesia, conducted among 204 participants in a state-owned electricity company, corroborated that transformational leadership significantly influenced the digital workplace. It is safe to infer that digital leadership shares attributes similar to transformational leadership, characterized by leaders who express a vision, support, and inspire their team members (Bass & Avolio, 1993). Similarly, Ming and Mansor (2024) research corroborated that distributed leadership, which strongly emphasizes decentralization and collaboration, can be a valuable addition to transformative leadership in the digital era.

Traditional Leadership and Digital Leadership

The fast digital transformation of the 21st Century has made it possible for anyone to access an incredible amount of information and knowledge dissemination instantly. Given the enormous opportunities the digital age presents, traditional hierarchical leadership models are no longer appropriate. Recent studies demonstrate that leadership is shifting from being leader-centered and hierarchical to relational and follower-centered (Malakyan, 2020). Digital leadership prioritizes autonomy, technological competence, and adaptability, whereas traditional leadership advocates for hierarchical decision-making and organized frameworks (Erhan et al., 2022; Harbani et al., 2021). Erhan et al. (2022), conducted a study titled "From Conventional to Digital Leadership: Exploring Digitalization of Leadership and Innovative Work Behaviour." The study investigates the relationship between digital leadership and innovative work behavior, demonstrating that digital leadership positively influences employees' innovative behaviors. Digital leadership and creative work behavior scales were used to gather data from 320 Turkish department managers working in the textile industry for the study. In order to test the hypothesis, path analysis was utilized. The results showed that employees positively perceived leaders who possessed strong digital skills and promoted an innovative work environment. Another study by Harbani et al. (2021) was conducted on digital leadership in facing challenges in the 4IR era, and this research sought to enable leaders to adopt attitudes and practices impacted by the rapid advancement of technology and the shift from traditional to digital leadership. The study is exploratory research and employed a descriptive qualitative approach. The study revealed that for an organization to succeed, a digital leader must demonstrate certain attributes: communication, openness, flexibility, risk-taking, leadership vigor, self-optimization, and interpersonal conflict resolution competencies. Meanwhile, traditional leadership, usually characterized by task orientation, decisiveness, and decision-making power, thrived in structured, predictable situations (Kiyak & Bozkurt, 2020). The study concluded that traditional leadership is inappropriate in the current era and that the 4IR substantially influenced leadership.

Similarly, the study by Malakyan (2020) admits that the discontinuity and conflicts between modern and traditional leadership styles provide both theoretical and practical options for changing from traditional to modern leadership in the digital era by proposing that the leader-follower trade (LFT) can bridge the divide between digital native and digital immigrant generations by easing the shift from hierarchical to distributed, shared, collective, and adaptive leadership in the digital age. It is worth noting that the above studies showcase a significant shift in leadership paradigms. Harbani et al. (2021) emphasized that for leaders to thrive in a technologically evolving environment, they must possess attributes such as flexibility, openness, and communication. Meanwhile, Erhan et al. (2022) also corroborated that digital competencies are not optional in promoting innovative ideas in this age but are a must for digital leaders. Malakyan (2020) further consolidates these findings by introducing the leader-follower trade (LFT) model, which brings together generational and hierarchical divides, highlighting the transition to collaborative and adaptive leadership in the digital era. These insights collectively indicate that the transition from traditional to digital leadership necessitates not only technological adoption but also a transformation in interpersonal dynamics.

A traditional leader is an individual with decision-making authority who is goal-oriented. In structural regimes where roles and tasks are well defined, he or she performs exceptionally well. On the other hand, more dynamic scenarios involving a great deal of uncertainty are better suited for the digital leader (Kiyak and Bozkurt, 2020). Digital leadership thrives in unpredictable situations and uses digital tools for creativity, flexibility, and teamwork, while traditional leadership flourishes in controlled environments. In another study, Antonopoulou et al. (2021) investigated relationships between traditional and digital leadership in the context of the COVID-19 pandemic in academic settings. Data analysis algorithms analyzed the results for descriptive, prescriptive, predictive, and diagnostic purposes. The outcome showed that interest in educational leadership, especially in academic contexts, has increased dramatically due to the COVID-19 epidemic. The findings showed that scholarly environments are most suited for digital leadership, which distributes leadership duties among academics. Meanwhile, the findings further revealed that transformational leaders who possess digital competencies are more productive when discharging their responsibilities in academic settings.

Despite the emerging benefits of digital leadership, Gilli et al. (2024), in a study titled "The future of leadership: new digital skills or old analog virtues?" reported a great concern that given the uncertain nature of the future,

decision-makers are wondering if, in the digital age, leadership will become less important or more relevant as daily management becomes more technologically advanced, or if it even needs to be rethought. This suggests that some leaders are still oscillating between digital and traditional leadership. Hence, digital transformation demands that leaders critically examine traditional and digital leadership styles while acknowledging their unique attributes for effective management. This comparative framework is critical for leaders to understand these changes if the need arises to harmonize traditional attributes with digital traits. These attributes or characteristics, as identified by Sloane (n.d.), cited in (Kiyak and Bozkurt, 2020) are as follows in (**Table 1):**

Table 1: Comparison of Traditional Leadership and Digital Leadership

S/N	Traditional Leaders	Digital Leaders
1	Traditional leaders consider their position and authority as the source of their power.	Digital leaders value teamwork more than individualism and think that a team's power is best utilized as a whole.
2	Traditional leaders do not always share information and knowledge freely; they often protect information ownership.	Transparency in information and knowledge sharing is a hallmark of digital leaders.
3	Periodically, traditional leaders pay attention to the opinions and recommendations of the team.	Digital leaders always encourage their teams to provide feedback and develop new ideas.
4	Traditional leaders make the decision and offer the group the approved resolution.	Digital leaders lead ideation meetings to generate solutions.
5	Traditional leaders only devote time and resources when absolutely necessary.	By giving time and resources when needed, digital leaders help the team advance.
6	Traditional leaders adhere to the defined roles and duties.	Digital leaders are flexible in their approach to new tasks and roles.
7	Traditional leaders tend to concentrate on symptoms.	Digital leaders are more concerned with identifying the primary cause.

THEORETICAL FRAMEWORK

Complex Leadership Theory (CLT)

The world has been changing since the turn of the twenty-first Century. We live in the information and digital age, a post-industrial era (Liagouras, 2005). In the information and digital era, post-industrial leadership theories shifted from person-centered, cultic, and basic theories of leadership to those that place more emphasis on the system-based CLT (Arena and Uhl-Bien, 2016; Malakyan, 2020; Uhl-Bien et al., 2007). The traditional industrial-era bureaucratic management paradigm still informs many management theories and practices today. As a result, they cannot address the problems of the modern world. Therefore, new management models and perspectives are needed to address today's issues (Balcı, 2014; Baltaci & Balcı, 2017; Drucker, 2012). The technological revolution and globalization have been major factors in creating 'the threshold of chaos', a competitive and complex environment for organizations operating in the twenty-first Century (Drucker, 2012). The position of Baltaci and Balcı (2017) is highly instructive that the leadership models grounded in traditional management perspectives are typically rigid, based on outmoded solutions to the problems of the past, and ill-suited to provide fresh approaches to organizational challenges in turbulent times. Similarly, Edmonstone (2016) asserted that adopting non-conventional management techniques is a unique leadership approach that will drastically change the traditional bureaucratic method. For contemporary organizations functioning in an extremely erratic, competitive, chaotic, and information technology-driven environment, complexity leadership offers an alternative strategy for survival (Baltaci & Balcı, 2017).

According to the complexity science lens, leadership is an emergent phenomenon that results from an agent relationship. This perspective holds that dynamic interactions give rise to leadership, which is more than just a skill, an exchange, or a symbol (Bradbury & Lichtenstein, 2000; Lichtenstein et al., 2006). In other words, CLT posits that leadership in complex environments should not be confined to traditional or hierarchical models of the industrial era. In moving away from the traditional approach to CLT, Lichtenstein et al. (2006) argue that the focus of new leadership theory based on this theoretical shift is from individual actions to contextual interactions across social systems, focusing on micro-strategic actions at all organizational levels. It emphasizes the importance of complex interactions in leadership outcomes, the relational foundations of change in emerging fields, and innovative methodologies for understanding leadership in complex environments. Although the complexity

leadership theory acknowledges that leadership is essentially a system phenomenon that transcends the individual, which shifts the focus away from the leader as an individual. This does not, however, lessen the significance of leadership as an organizational phenomenon (Hazy, 2006; Lichtenstein et al., 2006; Marion & Uhl-Bien, 2001, 2003). The CLT seeks to establish that current leadership operates in complex and dynamic environments, and as such, the current leadership paradigm cannot conform to traditional and hierarchical models. Instead, it should be seen as an emergent and adaptive process that unfolds organizational members' interactions. Put differently, formal leaders can facilitate the process's environment but are not the source of change directly (Lichtenstein et al., 2006). Thus, complexity leadership results from these interactions' dynamic processes and the emergent phenomena they give rise to. CLT emerges in the systemic interactions between heterogeneous agents (Lichtenstein et al., 2006; Marion & Uhl-Bien, 2001, 2003).

The CTL provides a fresh outlook on leadership studies by examining leadership through the complex adaptive system (CAS) lens. A CAS consists of agents, individuals, or groups of individuals who have interacted and shared worldviews in earlier times and who thus align by sharing common interests, knowledge, and goals (Lichtenstein et al., 2006). CLT seeks to achieve how leadership evolves through interaction rather than the great man theory that aims to idolize individuals or believe that leaders are born and cannot be made. It is a theory that seeks to inspire all to take leadership responsibilities. The CLT creates a broader platform for all. It shares attributes with distributive leadership (Brown & Gioia, 2002) and shared leadership (Pearce & Conger, 2003), which all advocate for a bottom-up leadership approach. This was echoed by Bolden (2011), who said that contemporary leadership in the post-industrial era has shifted from leader-centered to follower-inclusive and relational leader-follower models. The CLT is relevant as it offers a lens through which to examine how leadership changes in response to the increasingly complex and connected high school environment in the post-industrial era, where digital transformation reshapes educational practices. Traditional leadership styles often emphasize the implementation of established policies and practices. These styles may struggle to keep pace with the change and innovation that digital transformation brought about in the post-industrial age. Thus, digital leadership practices encourage a culture of collaboration and continuous learning, enabling schools to adapt to the demands of the digital age.

The relevance of CLT lies in its ability to address the inadequacies of traditional leadership styles in the post-industrial era. As the world transitions into the information and digital age, characterized by rapid technological advancements, organizations, including high schools, face increasingly complex and dynamic environments. Traditional leadership approaches, rooted in hierarchical and bureaucratic structures, often fall short in navigating these complexities. CLT, however, offers a more adaptive and emergent perspective on leadership, emphasizing the importance of dynamic interactions among organizational members rather than relying solely on top-down, leader-centric models. This shift is crucial for high school leaders as they adapt to the challenges and opportunities presented by digital transformation, requiring a leadership approach that fosters innovation, collaboration, and continuous learning.

Furthermore, high schools are not static institutions; they are embedded in a rapidly evolving ecosystem influenced by technological advancements, diverse student needs, and shifting educational paradigms. CLT provides a framework for understanding how leadership can evolve in such environments, moving from rigid, traditional models to more fluid and inclusive practices. By embracing CLT, educational leaders can better navigate the complexities of the digital age, ensuring that their schools remain responsive, innovative, and capable of meeting the demands of the 21st Century.

MATERIALS AND METHODS

Research Design

This study adopted a correlational research design. It is a non-experimental approach referred to as correlational research design employed to analyze, without manipulating, the relationship between two or more variables. It seeks to determine whether a relationship between variables exists and how strong it is. This was employed to examine the relationship between digital leadership practices and traditional leadership styles in high schools. This study's design is effective because it enables a thorough analysis of the attributes of both leadership paradigms in the context of the post-industrial era.

Sampling and Sampling Procedure

A multi-stage sampling technique was used to select high school leaders (principals, vice principals, and Heads of Departments) across the three senatorial districts of Oyo State, Nigeria. In the first stage, a purposive sampling technique was used to select 10 secondary schools from each of the three senatorial districts. Then, simple random sampling was used to choose 10 high school leaders from each of the 30 secondary schools. 231 high school leaders-respondents completed and returned the questionnaire.

Instrumentation

This study used two researcher-designed questionnaires titled School Leaders' Traditional Leadership Styles' Perceptions Questionnaire (SLTLSPQ) and School Leaders' Digital Leadership Practices Perceptions Questionnaire (SLDLPPQ) for data collection containing sections A, B, and C. The SLTLSPQ comprises eight items, while the SLDLPPQ has 11 items. The test and measurement and educational management experts (these are specialists in the field of educational assessment, psychometrics, and evaluation) were consulted to determine the instrument's content validity. In addition, the instrument's reliability was obtained through Cronbach Alpha (α) to measure the internal consistency among the items. The reliability index obtained is traditional leadership styles' perceptions (α =0.79) and digital leadership practices' perceptions (α =0.90) at a 0.05 significance level. Moreover, this study complied with all the ethical requirements and guidelines. The permission was sought from all the schools used for the study, and the researchers obtained the consent of the research respondent. The confidentiality of the data and anonymity of the research participants were guaranteed.

Ethical Consideration

This study complied with all ethical standards and was approved by the University of Johannesburg's Faculty of Education Research Ethics Committee with ethical clearance number: SEM 2-2023-003. The principals of every school the researchers sampled in Oyo State, Nigeria, were also asked for and granted permission by the researchers.

Data Analysis

This study used descriptive and inferential statistical methods to analyze the collected data rigorously. Descriptive statistics, including means, standard deviations, and simple percentages, were used to summarize participants' perceptions of traditional and digital leadership styles, providing a clear overview of central tendencies and response distributions. For inferential analysis, Pearson's Product-Moment Correlation (PPMC) assessed the relationship between traditional and digital leadership practices, while an independent samples t-test compared their mean differences, with statistical significance set at $p < 0.05$. These analytical tools ensured robust examination of the research hypotheses, enabling nuanced interpretation of how these leadership styles interact. Together, these methods facilitated the concise presentation of complex data and strengthened the validity and reliability of the study's conclusions.

RESULTS

The socio-demographic characteristics of the high school leaders who participated in this study showed that 50.6% of the participants were females, while 49.4% were males. Also, 91.3% of the high school leaders sampled were Heads of Departments (HODs), 6.9% were Vice Principals, and 1.7% were Principals. More so, 37.2% of the participants were within the age range of 41 – 50years; 28.8% were within 51 – 60years of age; 21.6% were between 31 – 40years of age, while 17.3% of the school leaders sampled were within the age range of 21 – 30years. In addition, 60.6% of the high school leaders bagged a Bachelor's Degree; 29.0% of them were Master's degree holders, while 10.4% acquired other educational qualifications. Furthermore, 25.5% of the high school leaders had 21years or above experience; 19.9% of them have between 16 – 20 years and 10 – 15 years of experience, while 18.6% have between 0 – 5 years of experience, and only 16.0% of them have between 0 – 10 years of experience.

Answering Research Questions

Research questions raised for this study were answered using descriptive statistics of the mean.

Research Question 1: What are the perceptions of high school leaders of traditional leadership styles?

The participants' perceptions of traditional leadership styles were analyzed item-by-item using mean statistics, then subjected to a weighted mean. The research instrument uses a four-point Likert scale for the questionnaire items; a mean value of below 2.0 indicates disagreement, while a mean value of 2.0 and above shows agreement. Owing to the four-response format of the questionnaire items, a cut-off mean value of 2.50 served as the decision's baseline. Since the perception could be positive or negative, the weighted mean score equal to or above 2.50 signified a positive perception, while below 2.50 showed a negative perception. The statistics of participants' perceptions are shown in **Table 2:**

Table 2: Perceptions of high school leaders of traditional leadership styles

SN	Items	Mean	S. D
1	Exercising strong authority is essential for effective leadership.	3.05	0.851
2	Hierarchy prevents confusion and conflicting directions.	3.06	0.821
3	Leaders should take decisions without input from subordinates.	1.90	0.841
4	Leaders who adhere to established traditions and practices are more effective.	2.94	0.781
5	A chain of command contributes to effective school management.	3.13	0.750
6	Discipline and order ensure effective leadership.	3.35	0.730
7	Established procedures are better than experimental approaches.	2.77	0.775
8	Leaders are respected based on their positions and titles.	3.05	0.863
	Weighted Mean	2.91	
	Remark	Positive Perception	

Note: Mean Value between 0 – 0.99 = SD, mean Value between 1.0 – 1.99 = D, while 2.0 – 2.99 = A and Mean Value between 3.0 – 3.99 = SA

As shown in Table 2, the perceptions of high school leaders of traditional leadership styles were positive. Hence, school leaders perceived that exercising strong authority is essential for effective leadership (Mean = 3.05; hierarchy prevents confusion and conflicting directions (Mean = 3.06); leaders should make decisions without input from subordinates (Mean = 1.96); leaders who adhere to established traditions and practices are more effective; a chain of command contributes to effective school management; discipline and order ensure effective leadership; established procedures are better than experimental approaches; and leaders are respected based on their positions and titles.

Research Question 2: How do high school leaders perceive digital leadership practices?

The participants' perceptions of digital leadership styles were analyzed item-by-item using mean statistics, then subjected **to** a weighted mean. Owing to the four-response format of the questionnaire items, a cut-off mean value of 2.50 served as the decision's baseline. Since the perception could be positive or negative, the weighted mean score equal to or above 2.50 signified a positive perception, while below 2.50 showed a negative perception. The statistics of participants' perceptions are shown in **Table 3.**

Table 3: High school leaders' perception of digital leadership practices

SN	Items	Mean	S.D
1.	Digital tools enhance communication and collaboration in school leadership.	3.26	0.613
2.	The adoption of digital tools helps to drive better school performance.	3.21	0.674
3.	School leaders must adapt to digital trends to be relevant and innovative.	3.28	0.729
4.	Online platforms and social media are effective digital tools used by school leaders.	3.01	0.763
5.	Digital leadership practice is not hindered by time and space.	2.76	0.716
6.	Digital tools encourage virtual/remote leadership.	2.96	0.700
7.	Digital leadership practices encourage diverse perspectives/inputs.	3.10	0.631
8.	High school leaders proficient in digital tools can drive digital advancements within the education system.	3.17	0.636
	Weighted Mean	3.09	
	Remark	Positive Perception	

Note: Mean Value between 0 – 0.99 = SD, mean Value between 1.0 – 1.99 = D, while 2.0 – 2.99 = A and Mean Value between 3.0 – 3.99 = SA

As indicated in Table 3, high school leaders positively perceive digital leadership practices. Therefore, high school leaders believe that incorporating digital technology tools are essential for effective leadership as it enhances communication and collaboration in school leadership, helps to drive better school performance, helps high school leaders be technologically savvy, and encourages diverse perspectives/inputs, among many others.

Hypotheses Testing

H_o1: There is no significant relationship between perceptions of traditional leadership styles and digital leadership practices.

Table 4: Relationship between the traditional leadership styles and the digital leadership practices

Variables	No	Mean	S. D.	df	R-value	Sig	Remark
Traditional Leadership Styles	231	23.26	3.237	229	.450	.000	Sig
Digital Leadership Practices		24.76	3.228				

**Significant at p<0.05*

Table 4 shows that the R-value of 0.450 is obtained with a p-value of 0.000 when computed at 0.05 alpha level. Since the p-value of 0.000 is less than the 0.05 alpha level, the null hypothesis one is not retained. Therefore, there was a statistically significant relationship between the traditional leadership styles and the digital leadership practices ($t_{\{229\}}$ =0.450, p<0.05).

H_o2: There is no significant difference between perceptions of traditional leadership styles and digital leadership practices.

Table 5: T-test statistics showing the significant difference between digital leadership and traditional leadership

	Mean	**Std. Dev.**	**N**	**df**	**t**	**Sig.**
Digital Leadership	24.76	3.228	231	230	32.070	0.000
Traditional Leadership	23.26	3.237				

P<0.05

Table 5 presents a significant difference between digital leadership and traditional leadership. The t-value is 32.072**,** which compares the means of two groups to see if they are significantly different from each other. The significance level p-value is 0.000. This value is less than 0.05 (P < 0.05), indicating that the difference between digital leadership and traditional leadership is statistically significant. In other words, the likelihood that the observed difference is due to chance is extremely low.

The data shows a statistically significant difference between digital leadership and traditional leadership. Digital leadership is rated significantly higher than traditional leadership, with the difference in means being highly unlikely to have occurred by chance (p < 0.05). This suggests that Digital Leadership is perceived as more effective or desirable based on the measured metric.

DISCUSSION

The findings from the first research question revealed a generally positive perception of traditional leadership styles among high school leaders. This aligns with the view that traditional leadership has long been a cornerstone in organizational structures, emphasizing hierarchy, discipline, and authority (Barker, 2001; Erhan et al., 2022). The positive perception is evident in the high mean scores for items like "exercising strong authority is essential for effective leadership" and "hierarchy prevents confusion and conflicting directions." These findings support the notion that a structured chain of command contributes to effective school management and aligns with the literature that describes traditional leadership as being defined by explicit power dynamics and hierarchical structures (Antonakis et al., 2019; Rizvi, 2022; Shaari et al., 2022; Reid-Griffin & Slaten, 2016; Gultekin et al., 2022). However, the relatively lower mean score on the item 'leaders should take decisions without input from subordinates' suggests a nuanced view often characterized by top-down decision-making (Lewin et al., 1939). This also revealed that high school leaders seem to recognize the limitations of a purely autocratic style in fostering a collaborative environment. This aligns with the evolving understanding in leadership literature that traditional leadership philosophies might not be appropriate for the administration of schools in recent times (Seleari, 2021; Richardson, 2024). Hence, new leadership styles emerge (Lipman-Blumen, 1992). Moreover, the perception that 'leaders who adhere to established traditions and practices are more effective' underscores the value placed on stability and consistency in leadership, which are hallmark traits of traditional styles (Nanjundeswaraswamy and Swamy, 2014). This view is further supported by the importance placed on discipline and order, reflecting a preference for predictable and controlled leadership environments, which is typical in traditional leadership models (Lipman-Blumen, 1992). Thus, the strong traditional leadership scores *(M=3.06* align with Barker's (2001) argument that hierarchical structures maintain stability during organizational change.

The second research question, which examined the high school leaders' perception of digital leadership practices, indicates a positive perception of digital leadership practices. It implies that leaders of high schools understand the significance of embracing digital tools and keeping up with technology advancements in their leadership styles. High mean scores for items such as "digital tools enhance communication and collaboration in school leadership" and "school leaders must adapt to digital trends to be relevant and innovative" highlight the

growing acceptance of digital leadership as a necessary evolution in the educational context. This positive perception aligns with the literature that positions digital leadership as an emerging paradigm driven by the 4IR, emphasizing flexibility, innovation, and the use of technology to achieve organizational goals (Cortellazzo et al., 2019; Ming & Mansor, 2024). The recognition that "digital tools help to drive better school performance" is consistent with studies suggesting that digital leadership fosters environments conducive to innovation and effective communication (Erhan et al., 2022; Şişu, 2023). Additionally, the emphasis on "incorporating digital technology tools is essential for effective leadership" reflects the need for digital competencies among school leaders, a view supported by the literature that advocates for the integration of digital skills in leadership to traverse the complexity of the contemporary educational environment (De Waal et al., 2016; Hamzah et al., 2021; Mihardjo et al., 2019). This finding also corroborates the argument that digital leadership has been influenced by technological advances and 4IR (Bach & Sulíková, 2021). Despite the results demonstrating the superiority of digital leadership, Gilli et al. (2024) warn against relying too much on technology and suggest analog virtues are still essential. This conflict emphasizes why balanced implementation is necessary.

The findings from the first hypothesis indicate a significant positive relationship between traditional leadership styles and digital leadership practices, as evidenced by an R-value of 0.450 and a p-value of 0.000. The p-value is less than the alpha level of 0.05; hence, the null hypothesis was rejected. This result suggests a statistically significant relationship between traditional leadership styles and digital leadership practices, implying that elements of traditional leadership can coexist or align with digital leadership within educational settings. The literature supports this finding, indicating that while traditional and digital leadership styles may differ in approach, they can share certain foundational aspects such as goal orientation, influence, and change management (Antonakis et al., 2019; Oberer and Erkollar, 2018). In the same vein, the current findings also agree with the position of Franco (2020), who contends that to lead more effectively in the digital era, leaders must modify their current leadership styles and adopt new leadership paradigms that incorporate the application of digital tools in a remote environment.

Digital leadership, although emerging in the context of technological advancements, still requires many of the same skills and competencies as traditional leadership, including decision-making, communication, and the ability to motivate and manage teams (Erhan et al., 2022; Ming & Mansor, 2024). This implies that leaders proficient in traditional leadership practices may find certain transferable skills valuable in digital contexts. The study also revealed that combining traditional and digital leadership practices can be more effective than relying solely on one style. This aligns with the theoretical framework of CLT, which advocates for a leadership approach that is not confined to traditional hierarchical models but is instead adaptive and emergent, allowing for the dynamic and complex nature of high school environments (Lichtenstein et al., 2006; Uhl-Bien, 2001). The coexistence of traditional and digital leadership (r=.488) empirically validates CLT's premise that adaptive and administrative functions can synergize in complex systems (Uhl-Bien et al., 2007). Thus, integrating traditional and digital leadership practices will allow for a more flexible and responsive leadership style that can adjust to changing conditions and promote an innovative culture.

The findings from the second hypothesis reveal a statistically significant difference between traditional leadership styles and digital leadership practices ($t = 32.072$, $p = 0.000$). The mean score for digital leadership practices ($M = 24.76$, $SD = 3.228$) is significantly higher than that for traditional leadership styles ($M = 23.26$, $SD = 3.237$). Given that the p-value is less than 0.05, we reject the null hypothesis (H_o2), indicating that digital leadership practices are perceived differently from traditional leadership styles, with a clear preference or greater effectiveness attributed to digital leadership in this study. These findings align with Cortellazzo et al. (2019) and Harbani et al. (2021), who posited that digital leadership is more suited to modern educational environments that demand agility, collaboration, innovation, and solid technological orientation. The digital era has transformed how leadership is enacted, with an emphasis on decentralized decision-making, teamwork, and collaboration, all of which are less prominent in traditional leadership models that promote autonomy and a hierarchical leadership paradigm (Kıyak & Bozkurt, 2020; Rizvi, 2022). The data suggests that digital leadership not only adapts better to contemporary challenges posed by technological advancements but also enhances the capability of educational leaders to foster a more collaborative and innovative environment. This could explain why digital leadership is perceived as more effective or desirable than traditional leadership in high school contexts.

CONCLUSION AND RECOMMENDATIONS

This study reveals an understanding of leadership styles in high schools, highlighting both the enduring value of traditional leadership and the emerging significance of digital leadership. Traditional leadership remains appreciated for its structure and authority, but its limitations in fostering collaboration and adapting to contemporary challenges are evident. Conversely, digital leadership practices are increasingly recognized for their capacity to drive innovation, enhance communication, and adapt to the rapid technological changes of the 4IR. The findings suggest a significant relationship between the two leadership paradigms, indicating that elements of traditional leadership can complement digital leadership practices in creating a more dynamic and effective

leadership approach. This study demonstrated that to successfully navigate the opportunities and challenges of the contemporary educational landscape, where flexibility, creativity, and the strategic application of technology are becoming more and more crucial, digital leadership is required in the post-industrial era. It is worth noting that the study focused exclusively on high school leaders in Oyo State, Nigeria, which may limit the generalizability of findings to other regions or educational levels. Hence, the following recommendations are made:

- Future studies could expand to multiple states for comparative analysis.
- High school leaders should consider integrating traditional and digital leadership styles to leverage the strengths of both approaches so that the hybrid model can provide stability and innovation.
- School leaders should undergo professional development and training in digital competencies to effectively incorporate digital tools and strategies in their leadership practices.
- School leaders should integrate digital tools into school administration to streamline administrative tasks, enhance stakeholder communication, and support teaching and learning.
- Future research should also investigate the long-term effects of digital leadership on learning outcomes and how various leadership styles affect the performance of teachers and students in various educational environments.

Implications of the Study for Leadership Development in High Schools

These findings have significant implications for educational leadership in the era of digitalization. School systems should create hybrid training programs that combine traditional approaches with digital competencies to produce leaders skilled in organizational stability and technological innovation. Policymakers must support this transition, especially in environments with limited resources, by providing targeted funding and developing infrastructure. The study also identifies critical research opportunities, especially longitudinal studies examining blended leadership models' effects on student outcomes in various contexts. As global education keeps changing, these observations from Nigerian schools provide insightful guidance for striking a balance between tradition and change everywhere. Ultimately, leaders who successfully navigate the twenty-first century's challenges will capitalize on both paradigms' advantages.

The findings also have significant implications for the development of high school leaders. As the study demonstrates, digital leadership practices are crucial for navigating the complexities of the technological era, and leaders in high school need to be equipped with the skills and competencies to lead effectively in this context. This includes fostering a digital learning culture, promoting digital citizenship, and encouraging collaboration and innovation among staff and students. The study suggests that high school leaders' professional development programs should focus on developing digital competencies and fostering continuous learning and adaptation to effectively navigate digital transformation challenges. This aligns with the literature, which emphasizes the importance of leadership development in preparing school leaders to navigate the challenges of digital transformation (Hamzah et al., 2021; Okunlola et al., 2024; Sabrian et al., 2022). Hence, as education systems worldwide navigate post-industrial transitions, this study provides empirical evidence that the most effective school leaders will be those who can strategically fuse digital adaptability with organizational stability - transforming challenges into opportunities for 21st-century learning.

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DATA AVAILABILITY STATEMENT

The article contains the original contributions; contact the corresponding author for further information.

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