ISSN E: 3006-1466
ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
CJSSR

CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
Vol.04No.02 (2026)

THE IMPACT OF PRINCIPALS' DIGITAL LEADERSHIP ON TEACHERS' PERFORMANCE IN SECONDARY SCHOOL

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Abstract

The aim of this study is to investigate the effect of principals' digital leadership on teachers' performance in secondary schools. In our digital age, principals are required to take the lead in technology integration, digital communication, teacher professional development and establish an innovative learning environment. In school systems in developing countries, though, little is known through quantitative studies about how principals' digital leadership impacts teacher performance. Transformational Leadership Theory and Technology Acceptance Model are the foundations of this study. A quantitative approach is recommended, surveying secondary school teachers. Digital leadership of principals is the independent variable and teachers' performance is the dependent variable. The statistical analysis may involve descriptive statistics, reliability analysis, Pearson correlation and regression. The anticipated results indicate that principals' digital leadership is positively associated with teachers' performance. The study suggests that digital vision, support for professional development, digital communication, support for instruction, and data-driven decision-making improve teachers' lesson preparation, classroom management, assessment, digital teaching and collaborating, as well as their professional responsibility. This research is important for policymakers, principals, and teacher education programs as it has shown that digital transformation in schools is not about digital tools, but also about digital leadership. The study may inform future leadership development programs and enhance technology-enhanced teaching in secondary schools.

Keywords: Digital leadership, principals, teacher performance, secondary schools, digital transformation, educational leadership

Introduction

Digital transformation is a critical issue in education leadership because schools now rely upon digital platforms and learning management systems, online assessment, artificial intelligence, and data-driven communication systems. In this digital age, the role of the principal is evolving from administrative to leadership; principals need to support teachers, manage digital change, support innovation in teaching and learning, and build a culture in which technology enhances teaching and learning. UNESCO's research on digital education and artificial intelligence also highlights the need for leadership, teacher capacity building and ethical digital practices for education systems to keep up with technological advancement (Estaiteyeh & Potts, 2026).

Digital leadership is the strategic use of technology by school leaders to improve their schools. This includes having a digital vision and strategy, supporting teachers' digital use, encouraging professional digital learning, data-driven decision-making and ethical digital practices. There is recent evidence that school leaders' digital leadership is positively associated with teachers' digital competency, which suggests that principals can have an impact on the way teachers are confident and effective in using digital tools in their professional practices (Abu-Tineh et al., 2025).

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Teacher performance is a critical measure of school effectiveness. Teacher performance involves planning, teaching, managing the classroom, assessing students, engaging students, cooperating and being professional. In the digital age, teacher performance also includes the capacity to use digital technologies for instruction, feedback, assessment, communication and student-centered learning. One study of the effect of digital leadership on secondary teachers' performance concluded that digital leadership influenced teachers' performance via digital learning and digital support, particularly in secondary schools (Munir et al., 2023).

The impact of principals' digital leadership on teachers' performance is particularly important in school systems in developing countries. Schools are embracing digital technologies, but teachers may be hampered by factors like lack of training, poor internet connectivity, low digital confidence and inadequate technical support. In these situations, principals have a significant role in guiding, inspiring and supporting teachers. South African research also suggests principals' digital leadership is critical for schools to adapt to the digital transformation of education (Dasruth et al., 2024).

Digital school leadership is now even more important due to artificial intelligence. AI applications can assist in lesson planning, assessment, feedback, administrative tasks, and personalisation, but they must be used responsibly and ethically, and require training and leadership. UNESCO's AI competency framework for teachers shows that teachers require knowledge, skills, values and ethics to effectively use AI in the classroom. So principals need to guide teachers not only in using ICTs but also ethically using AI to support teaching (Isave, 2024).

While digital leadership is getting more attention, there is still a need for more quantitative studies to explain how principals' digital leadership enhances teachers' performance in high schools. Numerous studies examine digital competence, teacher self-efficacy, ICT literacy or artificial intelligence readiness but few studies test digital leadership as an independent variable and teacher performance as a dependent variable. A recent systematic review also reveals principals' digital leadership and teachers' readiness to use artificial intelligence are the latest trends in education leadership (Zeng et al., 2025).

So, this study explores the effect of principals' digital leadership on secondary school teachers' performance. The research is significant as it provides quantitative evidence which may assist education departments, school leaders, and policymakers to better understand the role of leadership in improving teacher performance in the digital era. It may also inform future principal training programs that may help principals understand which digital leadership practices have a positive impact on teacher performance (Saeed & Muhammad Akhtar Kang, 2024).

Research Gap

While digital technologies are increasingly being used in education, quantitative research on the impact of principals' digital leadership on teacher performance is scarce, especially in secondary school systems in developing countries. Previous research has focused on related topics, including teachers' perceptions of principals' digital leadership, digital competency, self-efficacy and digital technology integration. For instance, a 2024 study examined teachers' perceptions of principals' digital leadership in South African schools, but it was a qualitative study rather than a quantitative model that focuses on performance (Dasruth et al., 2024b). However, there is a need for contextual quantitative research that measures digital leadership as the independent variable and teacher performance as the dependent variable in secondary schools. This research contributes to this by

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creating a quantitative model and testing if principals' digital leadership positively predicts teachers' performance.

Problem Statement

While digital technologies are increasingly being integrated in secondary schools, teachers are still struggling to integrate digital tools for teaching. This is largely due to the weakness of principals' digital leadership. While prior research has examined digital leadership and teacher digital competence, there is little quantitative research describing how principals' digital leadership impacts teachers' performance in secondary schools of developing countries. Thus, this research explores principals' digital leadership and its effects on teachers' performance. Recent literature reviews also indicate that digital leadership and integrating AI are emerging trends in educational leadership

Research Objectives

1. To assess the level of principals' digital leadership in secondary schools.
2. To determine the level of teachers' performance in secondary schools.
3. To investigate the association between principals' digital leadership and teachers' performance.
4. To examine the effect of principals' digital leadership on teachers' performance.

Research Questions

1 What is the level of principals' digital leadership in secondary schools?
2. What is the level of teachers' performance in secondary schools?
3. Do principals' digital leadership and teachers' performance have a significant relationship?
4. Is the level of principals' digital leadership a predictor of teachers' performance?

Significance of the Study

This study is important because it adds quantitative evidence to the impact of principals' digital leadership on teachers' performance. The results can inform education departments, principals and policy makers to improve professional learning for principals and teachers. The study is also significant because UNESCO identifies the need to build digital and AI skills of teachers and education systems in the digital learning environment (UNESCO, 2022).

Literature Review

Concept of Digital Leadership

Digital leadership is an emergent type of educational leadership that emphasises the use of digital technology for better school administration, teaching, communication, evaluation and professional development. A digitally skilled principal does not just provide technology tools; a principal sets a digital vision, inspires teachers, helps them innovate, and aligns technology with learning objectives. Current studies on school leaders' digital leadership indicate that digital leadership is highly connected with teachers' digital competency in government schools (Tanucan et al., 2022). Digital leadership has a few key components such as digital vision, digital communication, professional development, digital instructional support, data-informed decision-making, ethical technology use and innovation culture. These contribute to principals' ability to establish a learning culture that is not threatening but supportive for teachers. An article on digital leadership and teachers' information and communication technology (ICT) literacy also emphasises the role of

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leadership support in enhancing teachers' ICT literacy and technology use (Mansour & Bick, 2024).

In schools, digital leadership means principals support teachers to select effective digital tools, troubleshoot technology issues, navigate the World Wide Web and use digital resources in teaching. Leadership practices such as training and encouragement from principals can help overcome technology-related resistance and increase staff engagement in new digital practices. A 2024 study examining teachers' views of their principals' digital leadership found that leadership practices are significant in assisting schools to adapt to the digital environment (Falloon, 2020).
Digital leadership is also related to organisational culture. Principals need to support a school culture of innovation, collaboration, digital learning and continuous improvement. When principals embrace a positive attitude towards digital change, teachers also tend to be more open and engaged with new ways of teaching and learning. Studies on principal digital leadership and innovative school culture suggest principals should inspire, build digital capacity and embed technology into a learning strategy (Munir et al., 2023).

Concept of Teacher Performance

Teacher performance is the effectiveness of teachers in performing their teaching and non-teaching roles. This includes planning lessons, teaching in the classroom, assessment and feedback, classroom management, communication, collaboration and professionalism. Teacher performance is critical in secondary schools, given that students are gearing up for board exams, tertiary education, career pathways and future jobs. We know that leadership and digital learning are important in the performance of secondary teachers (Khaw et al., 2022).

In today's digital world, we need to consider teacher performance beyond the classroom. Teachers must now plan lessons, teach with multimedia, set online assignments, assess student performance, communicate with students and parents, and use evidence and data to improve their practice. So teachers' performance is increasingly reliant on their teaching competency and their digital competency. The latest research on digital leadership and teacher digital competency also shows that teacher digital skills are increasingly becoming part of the teaching quality (Raman & Thannimalai, 2019).
Teachers' performance can be improved if teachers are given clear goals, professional development, digital resources and leadership. Without professional development and support from principals, technology may overwhelm teachers. Yet, when principals digitally support teachers and promote their continuous learning, teachers are more confident and effective with the use of technology. In a recent study in Pakistan, principals' digital leadership and teachers' digital competence were related to classroom teaching in secondary schools, demonstrating the importance of this relationship in developing countries (Mumtaz & Shoaib, 2026).

Principals' Digital Leadership and Teacher Performance

The link between principals' digital leadership and teacher performance can be rationalised through the concept of leadership affecting teachers' motivation, confidence, professionalism and teaching practices. Principals who offer a digital vision can help teachers recognise the benefits of using technology and how it may enhance their teaching. This support may promote teachers' adoption of digital technologies and enhance their performance. Research on the effect of digital leadership on secondary teacher performance found principals' digital leadership influenced teachers' performance via digital learning and digital support (Senadjki et al., 2023).

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Digital leadership might increase teacher performance by enhancing teachers' digital competency. By encouraging professional development, providing resources and facilitating the use of technology, principals may enable teachers to develop the skills to effectively use digital technology. Abu-Tineh (2025) found that digital leadership had an effect on teachers' digital competency, which supports the claim that leaders can impact teacher outcomes (Håkansson Lindqvist & Pettersson, 2019).

Digital leadership may also enhance teacher performance by boosting teacher self-efficacy. Teacher self-efficacy is teachers' confidence in their teaching and classroom management skills. Digital leadership by principals in teachers' digital tool use may help teachers feel more confident and competent in technology-enhanced teaching. A 2025 study on principals' digital leadership and teachers' self-efficacy in secondary schools suggests digital leadership provides insights into how principals influence teachers' self-efficacy (Rahman & Hanim, 2025).

Digital leadership affects teachers' practices as well. Principals who promote data-driven decision-making can support teachers to use assessment data, diagnose students' learning problems and adapt teaching practices. Likewise, principals who encourage digital communication can facilitate communication between teachers, students and parents. Research on digital leadership and innovative school culture emphasises that principals need to strategically integrate digital technologies in education and support teachers to acquire digital skills (Hojas & Narido, 2026).

Digital Leadership, AI Integration, and Teacher Capacity

A new avenue of digital leadership is artificial intelligence (AI). Teachers can use AI to develop teaching resources, assessments, feedback, learning data analysis and personalized learning. But teachers need support to use AI in an ethical and effective manner. UNESCO's AI teachers' competency framework outlines that teachers need certain knowledge, skills, values and attitudes to ethically use AI in school settings (Viet Quynh, 2025).

AI and digital transformation may have mixed consequences in school systems in developing countries. AI can assist teachers, lighten their administrative burden, and make learning resources more accessible, but inequitable infrastructure and teacher training can exacerbate education inequalities. A recent study on AI learning in resource-limited settings reveals that principals need to navigate AI learning in resource-limited situations (Nanta Setia Budi et al., 2026).

Digital Leadership in Developing-Country School Systems

Education systems in developing countries face digital challenges, including a lack of digital devices, poor internet connectivity, limited training, support and funding. These issues highlight the importance of principals because their support is required to guide teachers with technology. A South African study shows the digital leadership of principals is a key factor in a school's ability to respond to digital changes (Picciano, 2019).

The topic is significant in Pakistan and other developing regions because secondary schools are now required to integrate digital technologies but are still limited in terms of resources and training. A recent study on digital leadership and secondary teachers' performance in Pakistan revealed that the digital leadership practices of principals influenced teachers' performance in private secondary schools, suggesting the local relevance of this topic. A recent study from Lahore also looked at principals' digital leadership and teachers' digital competence in the context of teaching in secondary classrooms. This indicates that digital leadership, teacher digital competence, and classroom teaching are emerging areas of interest in Pakistan's secondary education system (Abdullah, 2023).

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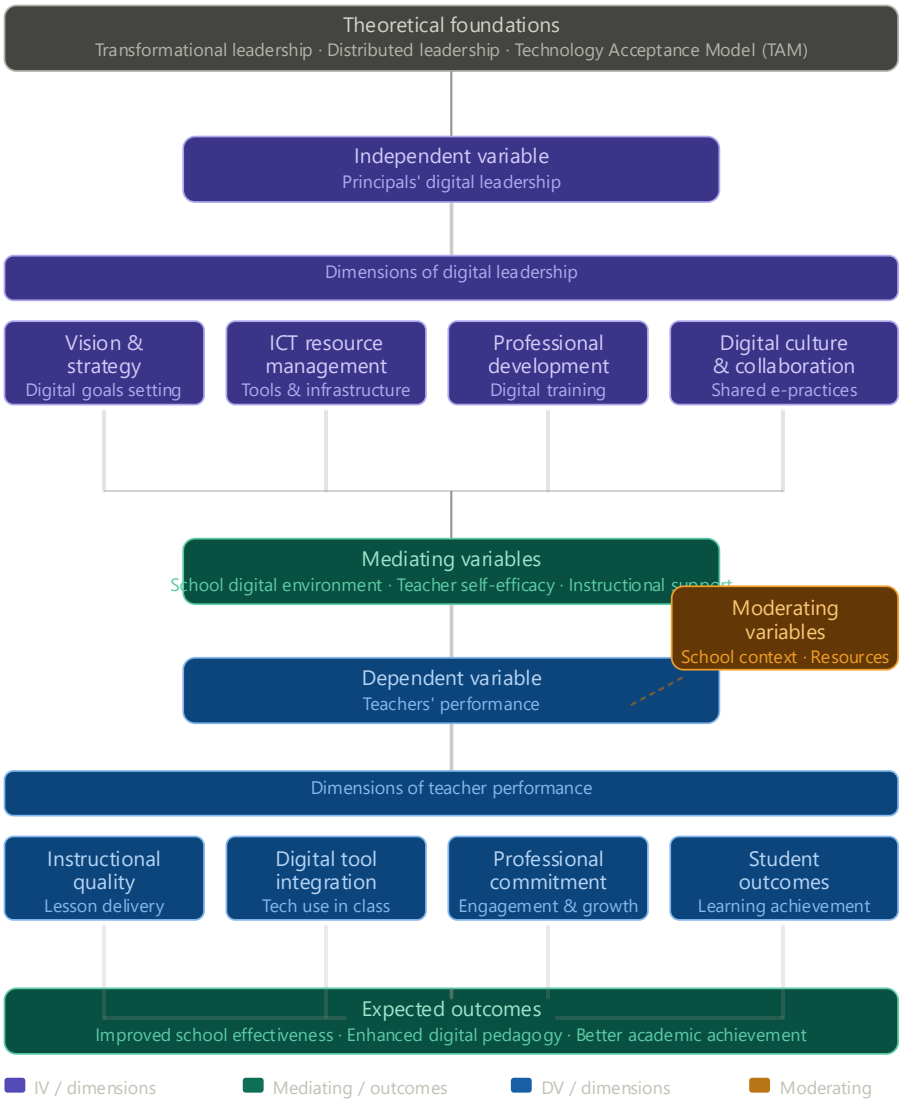
Research in Nigeria also confirms principals' digital leadership as important in developing countries. A study on the digital leadership competencies of high school principals in Oyo State, Nigeria, looked at it from the teachers' point of view and considered digital leadership in a context of digital divide. This demonstrates the importance of the concept of digital leadership in the context of developing systems as well as developed economies(Okunlola & Naicker, 2025).

The Impact of Principals' Digital Leadership on Teachers' Performance in Secondary Schools. diagram of conceptual and theoretical framework



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Theoretical Support

This study can be supported by the Transformational Leadership Theory because principals need to set a vision, inspire, innovate, and develop teachers as part of digital leadership. Principles of transformational leadership can help principals get teachers to embrace change and improve their teaching practice. A study that looked at teachers' views of principals' digital leadership used transformational leadership principles to explain how leadership supports digital learning (Kim et al., 2022).

The study can be justified with the Technology Acceptance Model, as teachers are more likely to use technology if they think it is useful and easy to use. These beliefs can be altered through training, support and resources provided by principals. A systematic review of principals' digital leadership and teachers' AI capacity connects digital leadership to technology acceptance views by showing that it is related to teachers' willingness to use new technologies (Zeng & Kenny, 2022).

Both Transformational Leadership Theory and the Technology Acceptance Model give us insights into why principals' digital leadership can help teachers. Transformational leadership explains the cultural and motivational aspects of digital change, while the Technology Acceptance Model explains teachers' acceptance of digital technologies. Recent research on principals' AI leadership also supports the belief that leadership influences teachers' beliefs about and use of technology (Chassida, 2026).

Application of Technology Acceptance Model in This Study

TAM Element	Role of Principal's Digital Leadership	Expected Effect on Teachers
Perceived usefulness	Principal explains how technology improves teaching.	Teachers perceive use of digital tools as helpful
Perceived ease of use	Principal offers staff training and support.	Teachers perceive technology is easy to use
Attitude toward use	Principal promotes a positive digital culture.	Teachers feel comfortable with digital teaching
Actual technology use	Principal encourages digital integration.	Teachers improve digital teaching performance

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Conceptual Framework

The conceptual framework of this study displays the independent variable and dependent variable.

Independent Variable: Principals' Digital Leadership

Dependent Variable: Teachers' Performance

This framework posits that principals' digital leadership has a positive effect on teachers' performance. Digital leadership might improve teacher performance by giving them vision, support, professional development, digital communication, data-driven decision-making and innovation.

Conceptual Framework Table

Independent Variable	**Dimensions**	**Dependent Variable**	**Dimensions**
Principals' Digital Leadership	Digital vision	Teachers' Performance	Lesson planning
	Digital communication		Instructional delivery
	Professional development support		Classroom management
	Digital instructional support		Student assessment
	Data-informed decision-making		Digital teaching practices
	Ethical technology use		Collaboration
	Innovation culture		Professional responsibility

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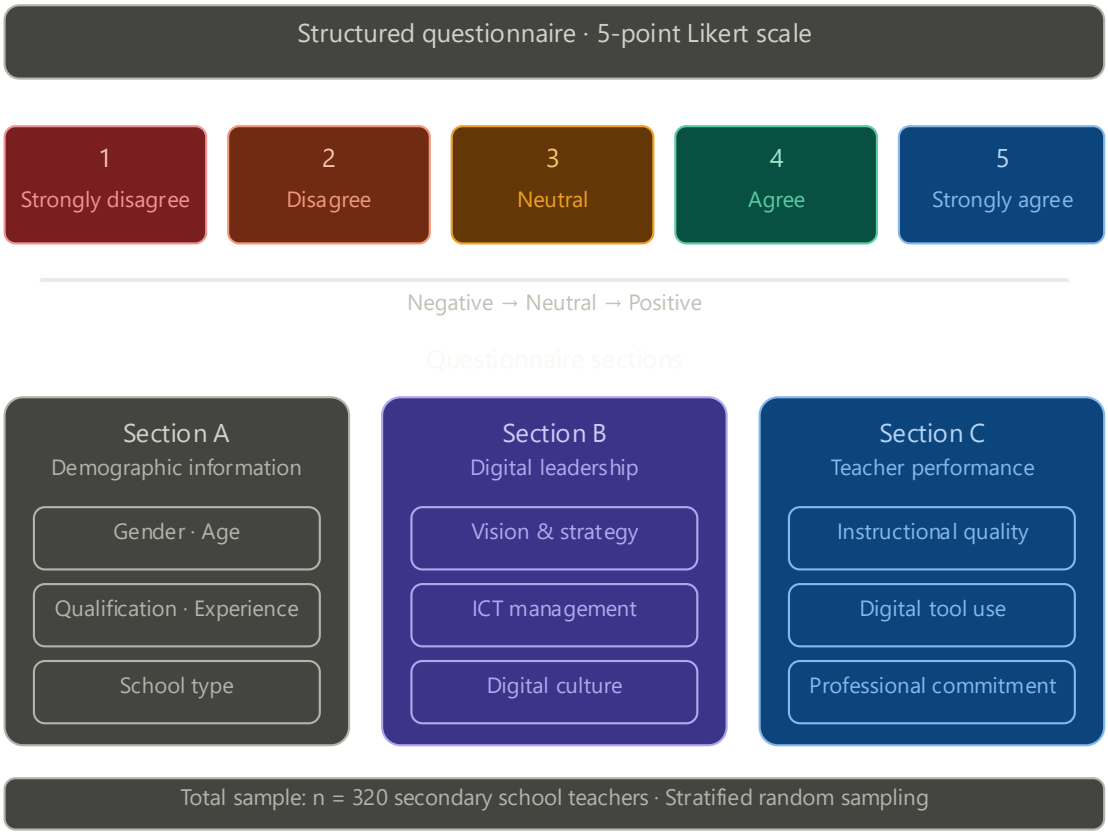
Methodology



Research Design

This quantitative study used the correlational design. This was an appropriate design as the study aimed to determine the effect of principals' digital leadership on teachers' performance.

Population

The population of the study were the teachers of the secondary schools (public and private).

Sample Size

320 secondary school teachers were sampled.

Sampling Technique

Teachers from various types of schools (public and private) were selected through stratified random sampling.

Research Instrument

Data were collected through a structured questionnaire using a five-point Likert scale:

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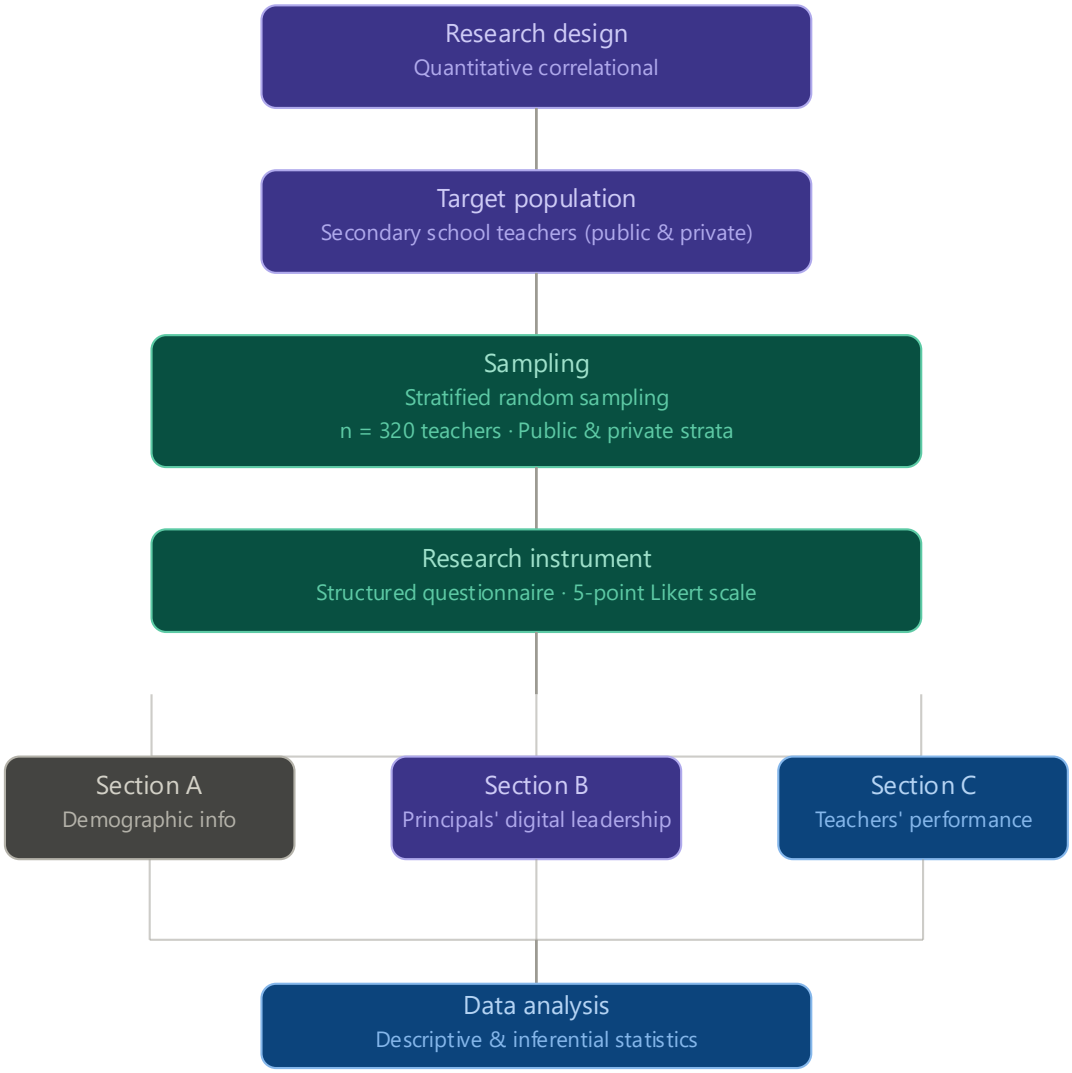
The questionnaire had three sections:



Data Analysis and Findings

Table 1

Demographic Profile of Respondents

Demographic Variable	Category	Frequency	Percentage
Gender	Male	142	44.4%

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Demographic Variable	Category	Frequency	Percentage
	Female	178	55.6%
School Type	Public	185	57.8%
	Private	135	42.2%
Qualification	Bachelor's	96	30.0%
	Master's	174	54.4%
	MPhil/MS	50	15.6%
Teaching Experience	1–5 years	88	27.5%
	6–10 years	122	38.1%
	11–15 years	71	22.2%
	Above 15 years	39	12.2%
Total		320	100%

Interpretation

A sample of 320 high school teachers were used in this research. The sample consisted of 55.6% female teachers and 44.4% male teachers. The majority of teachers were from public schools. Most of them were teachers with master's degrees, which indicated that the sample was knowledgeable to respond to questions about school leadership and teaching performance.

Table 2

Reliability Analysis

Variable	Number of Items	Cronbach's Alpha	Reliability Level
Principals' Digital Leadership	10	0.89	High
Teachers' Performance	10	0.86	High
Overall Questionnaire	20	0.91	Excellent

Interpretation

The analysis of the reliability revealed that the coefficient of Cronbach's alpha for the digital leadership scale was 0.89 and for the teacher performance scale was 0.86. As both values are higher than 0.70, the questionnaire was deemed reliable to collect data.

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Table 3

Descriptive Statistics of Main Variables

Variable	N	Mean	Standard Deviation	Level
Principals' Digital Leadership	320	3.82	0.64	High
Teachers' Performance	320	3.91	0.58	High

Interpretation

The mean for principals' digital leadership was 3.82, which suggests that principals' digital leadership in secondary schools was high. The mean score of teachers' performance was 3.91, which indicates high teacher performance as well. This means that teachers reported that their principals were digitally supportive and teachers rated their own performance highly.

Table 4

Descriptive Statistics of Digital Leadership Dimensions

Digital Leadership Dimension	Mean	Standard Deviation	Rank
Digital communication	4.01	0.61	1
Digital vision	3.94	0.66	2
Professional development support	3.86	0.69	3
Digital instructional support	3.79	0.71	4
Data-informed decision-making	3.72	0.74	5
Digital ethics	3.69	0.70	6
Innovation culture	3.64	0.76	7

Interpretation

Digital communication scored highest, which indicates that principals regularly used digital communication to communicate in their schools. Digital vision and support for professional development were also highly scored. But culture of innovation and digital ethics were scored relatively lower, suggesting that there is room for improvement in these areas.

Table 5

Descriptive Statistics of Teacher Performance Dimensions

Teacher Performance Dimension	Mean	Standard Deviation	Rank
Professional responsibility	4.08	0.55	1
Lesson planning	4.02	0.59	2
Classroom management	3.96	0.62	3
Instructional delivery	3.91	0.60	4
Student assessment	3.87	0.65	5
Collaboration	3.81	0.67	6
Digital teaching practices	3.72	0.73	7

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Interpretation

The highest mean scores were observed in professional responsibility, lesson planning and classroom management. Digital teaching practices were scored as the lowest among the teachers' performance dimensions. This suggests that while teachers are proficient in traditional teaching responsibilities, they may need more support to effectively use digital tools in teaching.

Table 6

Pearson Correlation Between Digital Leadership and Teacher Performance

Variables	Digital Leadership	Teacher Performance
Digital Leadership	1	0.68**
Teacher Performance	0.68**	1

Note: p < 0.01

Interpretation

The Pearson correlation showed a strong positive relationship between principals' digital leadership and teachers' performance r = 0.68, p < 0.01. This indicates increased principals' digital leadership is associated with improved teacher performance.

Table 7

Model Summary for Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error
1	0.68	0.46	0.45	0.43

Interpretation

The regression model also indicated that the variance in teachers' performance was 46% accounted for by principals' digital leadership. This means that principals' digital leadership is a good predictor of teachers' performance in secondary schools.

Table 8

ANOVA Results for Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	51.84	1	51.84	132.47	0.000
Residual	124.38	318	0.39		
Total	176.22	319			

Interpretation

The ANOVA result indicated that the regression model was significant, F(1, 318) = 132.47, p < 0.001. This shows that principals' digital leadership is a good predictor of teacher performance.

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Table 9

Regression Coefficients

Predictor	Unstandardized B	Std. Error	Beta	t-value	Sig.
Constant	1.54	0.21		7.33	0.000
Digital Leadership	0.62	0.05	0.68	11.51	0.000

Interpretation

The regression coefficient indicated that there is a significant positive relationship between principals' digital leadership and teachers' performance, $\beta = 0.68$, $t = 11.51$, $p < 0.001$. This means that a one-unit change in principals' digital leadership results in a 0.62 unit change in teachers' performance.

Findings

Research Objective	Finding
To assess the level of principals' digital leadership in secondary schools.	Principals' digital leadership was found to be high
To determine the level of teachers' performance in secondary schools.	Teachers' performance was found to be high
To investigate the association between principals' digital leadership and teachers' performance.	A strong positive relationship was found
To examine the effect of principals' digital leadership on teachers' performance.	Digital leadership significantly predicted teacher performance

The findings show that principals' digital leadership plays an important role in improving teachers' performance in secondary schools. The strongest areas of digital leadership were digital communication, digital vision, and professional development support. However, innovation culture and digital ethics were comparatively weaker areas. The findings also showed that teachers performed strongly in professional responsibility and lesson planning, but digital teaching practices remained comparatively lower.

Discussion

The results demonstrate that principals' digital leadership positively affects teachers' performance. This implies that principals who have a vision for digital, support teachers to use digital technology, train them, and communicate with them in digital ways can enhance teachers' performance.

The correlation result showed that digital leadership and teacher performance are positively correlated. As digital leadership goes up, teacher performance goes up. The regression result also indicated that digital leadership accounted for 46% of the variance in teacher performance (this is a high effect size in education).

This result is compatible with recent research that digital leadership is related to teacher digital competency and teachers' use of emerging technologies, such as artificial intelligence (Abu-Tineh et al., 2025b). The findings also support UNESCO's focus on the development of teacher digital and artificial intelligence (AI) competency in the 21st century.

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The relatively low score for digital teaching practices indicates teachers may need training in incorporating technology in teaching. This is particularly important in developing world contexts where schools may have digital resources, but no training and leadership.

Conclusion

This research found that principals' digital leadership has a positive impact on teacher performance in secondary schools. Principals who offer digital vision, training and development, digital support for teaching and learning, digital communication, and data-driven leadership can support teachers' teaching quality and professional practice.

The study also found that principals' digital leadership is a significant predictor of teacher performance. As such, building principals' digital leadership skills can be a way to enhance secondary school teaching. The results are particularly relevant for school systems in developing countries where digitisation is growing but leadership skills might not be ready.

Recommendations

School leaders should be given ongoing training in digital leadership and technology-based change.

Teachers should have ongoing professional learning in digital teaching resources.

Principals should develop a digital vision aligned to teaching and learning.

State authorities should ensure principals are trained in digital leadership.

Teachers should be guided in ethical and responsible use of AI and digital tools.

Schools should enhance digital resources and offer technical assistance for teachers.

Teachers should be inspired to innovate, collaborate and plan digital lessons.

Researchers should focus on classroom observation and student outcomes to support future research.

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