JUPIIS: Jurnal Pendidikan Ilmu-ilmu Sosial, 15 (2) (2023): 237-249
DOI: 10.24114/jupiis.v15i2.51553

JUPIIS: Jurnal Pendidikan Ilmu-ilmu Sosial

Available online http://jurnal.unimed.ac.id/2012/index.php/jupiis

IMPLEMENTATION OF DIGITAL LEADERSHIP OF SCHOOL PRINCIPALS IN INDONESIA: SYSTEMATIC LITERATURE REVIEW

Aulia Riski[1], Diding Nurdin[2], Nani Hartini[3], Mohamad Djodi Hardi Prajuri[4]
Departement of Administrational Education, Faculty of Educational Science, Universitas Pendidikan Indonesia, Bandung, Indonesia[123]
Graduate School of Education, University of Pennsylvania, Pennsylvania USA[4]

auliariski45@upi.edu[1], didingnurdin@upi.edu[2], nani_hartini@upi.edu[3]
djodihp@upenn.edu[4]

Accepted: November, 6th 2023 Published: December, 17th 2023

Abstract

Digital leadership is strategic leadership that uses technology, particularly digital assets, to further the company's objectives. As for school principals, digital leadership plays a crucial role in anticipating possible issues and in cultivating highly effective educators who are equipped to tackle the demands of 21st-century skills. This study aims to assess Indonesian school principals' digital leadership capabilities. The study discussed in this paper is a systematic literature review (SLR) related to the role of school principals' digital leadership in raising academic standards published within the previous five years. The Preferred Reporting Items protocol for Systematic Reviews and Meta-Analyses (PRISMA) was employed to analyse articles from the Crossref database using Harzing's Publish or Perish software— 40 journal papers were included in this study. The findings of this study show that a school principal's digital leadership skills favour supporting an efficient learning process, which has implications for the accomplishment of previously defined educational goals. The study's findings also suggest that, in order to raise academic standards and meet more ideal learning goals, digital school leadership abilities must be used in the field of education. In order to enhance the implementation of digital leadership in Indonesian schools, stakeholders in education, such as teachers, administrators, and other authorities, can benefit greatly from the research's findings. Furthermore, this study can be used as a springboard for more investigation into this field, which will help us comprehend how to enhance digital leadership to promote innovative and successful learning in Indonesian classrooms. The research's conclusion is that school administrators in Indonesia need more knowledge, assistance, and training when it comes to digital leadership. Due to the swift changes in the educational landscape brought about by technology, stakeholders need to give top priority to enhancing the digital literacy of staff members and principals. This is because integrating ICT to enhance learning and administration requires them to be digitally literate. Additionally, in order to guarantee that the resources and infrastructure required to support the development of effective digital leadership in Indonesian schools are available, cooperation between educational institutions, the government, and training facilities is crucial. By considering these ramifications, we may improve educational outcomes for upcoming generations and create a system of education that is more adaptable to technological advancements.

Key words: *Digital Leadership, Quality Education, School Principal*

How to Cite: Riski. A., Nurdin. D., et.al. (2023). Implementation of Digital Leadership of School Principals in Indonesia: Systematic Literature Review. JUPIIS: Jurnal Pendidikan Ilmu-Ilmu Sosial. (237-249)

*Corresponding author:
auliariski45@upi.edu

ISSN 2085-482X (Print)
ISSN 2407-7429 (Online)

INTRODUCTION

Many organizations around the world, including educational institutions, have undergone a digital transition (Yaminah et al., 2023) (Katuuk et al., 2021). The quality of educational institutions and instruction is improved with the aid of technology through student performance and learning methods (Yaminah, 2023). With this shift from conventional to technological education, the quality of teachers and pupils is becoming increasingly important for accuracy. Education is a field where the impact of technology cannot be separated in the increasingly developed and advanced era of globalization. Teachers today must not only be experts in their subject area but also be able to manage a technology-based classroom (Akbar & Noviani, 2019). Teachers must now be open to learning how to develop their leadership abilities in technology-based school administration. To achieve preset educational goals, classroom management in the digital age is essentially inseparable from the fundamental principles of education management that existed before (Hartati et al., 2023) (Paramansyah & SE, 2020). For a teacher to be able to offer the greatest educational services to pupils in the proper approach, technique, and method, effective classroom management is crucial.

Leadership is the capacity to exert influence over others, not a position (Waruwu, 2021). It can be a director who, despite holding the job, is powerless to motivate his staff to improve their performance as a whole. Another explanation is that a regular employee, who does not hold a structural role, is more respected or looked up to by their coworkers. He is therefore merely a boss, not a leader, because he lacks the power to influence a boss. A leader who cannot get followers is just someone who marches alone with no one to follow or even join them. Because leaders are individuals who care about other people and are eager to empower others, they must also have an awareness of others' needs and not simply consider their own (Mulyasa, 2022). A leader also has a future orientation, which is distinct from a short-term orientation that can only be enjoyed momentarily. A leader thinks about ideal conditions or situations, such as what should be accomplished collectively in the future (Jannah et al., 2023).

Because the employment market will be driven by advancements in the digital economy, robots, artificial intelligence, and automation technologies, many educational institutions throughout the world must be prepared for the fourth industrial revolution (Adha, 2020) (Alam et al., 2019). Due to the impending problems, all school administrators must keep an open mind regarding the advancements and changes brought about by the rapid advancement of technology (Timan et al., 2022). In Indonesia, principals must be equipped with the most recent information and communication technology (ICT) abilities in order to be ready for problems. To give 21st century educational skills and knowledge, principals must serve as technology leaders and teachers must serve as facilitators (Hapudin, 2021).

According to (Fajri et al., 2021) and (Mardhiyah et al., 2021), the three categories of 21st century skills are: (1) life and career skills, (2) learning and innovation skills, and (3) information media and technology skills. The leadership of the principal is the primary factor in a school's ability to produce excellent graduates, according to a number of theoretical and empirical research (Sihaloho, 2022) (Mukhlasin, 2021). The duties of school principals are getting more and more difficult as schools are required to not only generate a qualified and creative workforce to satisfy the demands of the digital economy, but also to re-engineer students' thought processes in an era of rapid change. As a result, school administrators need to be proficient in ICT in order to direct, encourage, and lead programs for teachers to incorporate technology into the classroom (Majir, 2020).

To determine whether leadership in the digital era is one of the areas that should be stressed in the professional development of school administrators, so that they are capable of motivating teachers and pupils, more research can be done. The employment of technology in schools has been the subject of numerous studies (Aisa & Lisvita, 2020) (Amalia, 2020) (Damayanti & Nuzuli, 2023) (Kalalo et al., 2022). It has been established via prior studies that school administrators are crucial to the implementation of ICT in the classroom.

The phrase "digital leadership" was created in reaction to the 21st century's rapid

technological progress. Whereas, in general, digital leadership is focused on using information technology to serve clients in a variety of companies, including both educational and non-educational organizations (Musfah, 2022). The primary goals of using various information technology applications in an organization or institution are to speed up the business transaction process and improve the organization's competitiveness (Laratmase, 2023). The ability of leaders to empower information technology, enhance human resource (HR) competencies, and empower the assets of the firm or institution they lead in order to fulfill the direction and goals specified is also referred to as "digital leadership". All of these assets must be utilized optimally by developing personal competence, mindset and applying new methods in accordance with the times.

Therefore, it is essential for a leader to be able to guide the organization, institution, or business that he manages toward going digital. The ability of a teacher to use digital technology to accomplish preset learning goals can be summed up as digital leadership (Ulfah et al., 2022) (Ziaulhaq, 2022). According to (Tulungen et al., 2022) and (Goreta et al., 2022), digital leadership is a combination of digital culture and digital competence. The study of leadership discourse based on Hambrick and Mason's upper echelon theory, which holds that outcomes may be predicted by a manager's personality, includes digital leadership research. According to (Maksum, 2022) and (Purwoko et al., 2022), "digital leadership" is a leadership approach that focuses on implementing digital transformation within a company. With the help of this leadership style, businesses and organizations may digitize their workplace and workplace culture. Fisk asserts that digital leaders are visionaries, change agents, capable of combining ideas for initiatives in business, and able to forge connections by opening up fresh possibilities for collaborations, joint ventures, outsourcing, and other types of collaboration (Yaminah et al., 2023).

The school principal's digital leadership is essential for foreseeing potential issues and for producing high-performing teachers who are prepared for the challenges of the twenty-first century. The ability to respond rapidly to any changes in order to ensure that the organization continues to function as it should is a key component of the digital leadership position that the school principle plays (Timan et al., 2022). All decisions, policies, and technological implementation at the school that are related to technology are represented by the principal's digital leadership. Visionary leadership, a culture of digital age learning, excellence in professional practices, systemic improvement, and digital citizenship are the five constructs that make up digital leadership (M. P. Dasmo, 2022).

In this situation, the principal's digital leadership plays a critical role in how successfully technology is implemented in classrooms. In order to effectively use technology in educational settings, school administrators must have the following skills: the ability to comprehend and adopt technological innovations, integrate digital tools into the learning process, manage technological resources, and inspire staff and students to actively participate in technology use (Mukhid, 2023). The study of school principals' digital leadership is important for efforts to raise the standard of education in the digital age. This study will look at how a school principal's digital leadership is put into practice to raise academic standards. This research is expected to provide a better understanding of the role of school principals in managing technological change in the educational environment.

METHODOLOGY

The method used in this research is Systematic Literature Review (SLR). This research method is carried out by identifying, reviewing, evaluating, and interpreting all available research. This method reviews and identifies journals systematically in each process following the following steps (1) Research Question, made based on the topic chosen by the researcher. (2) Search Process, used to obtain answers to research questions in the previous step obtained from relevant sources. The search process can use the google chrome search engine with the site http://garuda.ristekdikti.go.id for primary data and http://google.com for secondary data. (3) Inclusion and Exclusion Criteria, at this stage a decision is made on whether or not the data used in SLR research is feasible. (4) Quality

Assessment, at this stage the data that has been found willbe evaluated based on the criteria questions in the predetermined quality assessment. (5) Data Collecting, is the stage where existing research data is collected. And (6) Data Analysis, at this stage the data that has been collected will be analyzed to show the results of the research questions that have been made previously and conclusions are drawn (Zamista, 2022).

This research collects journal articles on the Crossref database with the help of the Publish or Perish application, the keyword is digital leadership. The articles collected are only articles published in the last 5 years, from 2019 to 2023, due to the massive implementation of technology in the world of education due to technological developments and covid-19. The protocol the author uses is the PRISMA Protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes). The primary study selection process is carried out through four stages that refer to PRISMA, namely; identification, screening, eligibility, and inclusion (Ariati, 2022). From the articles collected, we selected 64 articles that were closely related to the keywords used. In the next step, researchers grouped articles related to the topic to be discussed into 30 articles, then this article will be reviewed and studied by researchers comprehensively.

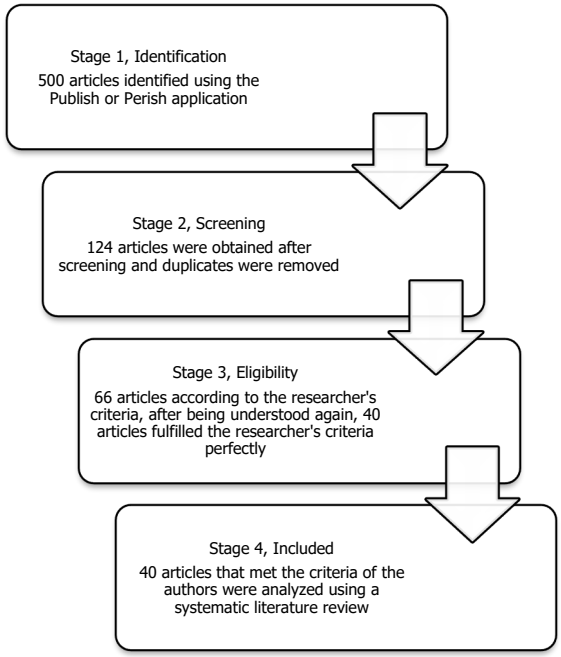

Figure 1. Digital Leadership Prism Diagrams

RESULT AND DISCUSSION

The results of the research data included in this literature review are an analysis and summary of documented research related to digital leadership. In this study, researchers categorized based on five moderating variables, namely research year, education level, sample size, research type, and country. The results of the analysis can be seen in the following table:

Table 1. Analysis Results

Criteria		Number of Article
Research Years	2019	7
	2020	9
	2021	10
	2022	13
	2023	11
Educational Level	Elementary School	12
	Junior High School	13
	Senior High School	15
Sample Size	< 30	14
	>= 30	26
Type of Research	Qualitative	14
	Quantitative	17
	Mix Method	9
Research Location	Palu	1
	Jakarta	3
	Bandung	4
	Pekanbaru	2
	Cirebon	2
	Pasaman	1
	Semarang	2
	Bali	2
	Palembang	2
	Pontianak	1
	Yogyakarta	4
	Malang	3
	Medan	2
	Padang	3
	Makasar	2
	Aceh	2
	Balik Papan	1
	Surabaya	3

In order to increase the competitiveness of educational institutions, it is imperative that the Principal implement digital leadership in educational institutions as a Leader consistently while taking into account a variety of current conditions and situations. This must be done in

accordance with the policies and guidelines established by the relevant Ministries through established regulations as well as by international agreements. The Emerging, Applying, Infusing, and Transforming Stages are the four primary phases that an educational institution leader must go through while implementing digital leadership, as defined by UNESCO (United Nations Educational, Scientific, and Cultural Organization) in 2013 (Andriani et al., 2022).

The primary actor in managing input, process, and output in accordance with the National Education Standards (SNP) is the school principal (Yustian et al., 2023) (Nasution et al., 2022). As a result, there are numerous ways for school principals to exercise 21st century leadership. By identifying issues in his school as the foundation for school growth, the principal must first be able to understand the chances and potential that exist (Nurjaningsih, 2019). The active participation of school stakeholders, such as teachers, education staff, students, and parents as well as associated parties outside the school, in problem-solving is crucial for school principals. According to the higher order thinking skills approach, or HOTS (higher order thinking skills), the principal in his capacity as supervisor must be able to act as an instructional leader in developing and executing 21st century learning (Hartanto & Purwanto, 2019). Third, in order to implement dynamic education in line with the growth of industry 4.0, school administrators must be able to welcome all education stakeholders in schools, including teachers, education personnel, and parents of students. Fourth, school principals need to give teachers, education personnel, and students who succeed enthusiastic support and admiration for their successes, inventions, and other honorable accomplishments (Asyari, 2020).

Education, especially schools, is instantly impacted by industrial advancements that lead to digitization or what is known as industry 4.0. There are many different technology projects where administrators and teachers can apply a curriculum dependent on the skill level of their students (Elvina, 2021). carry out various sorts of platform infrastructure that will later be used in the educational system to increase the accuracy or personalisation of class student competences as well as competence. The government's efforts towards the school digitization initiative, which was started last year through the launch of the program, are of course in harmony with the demands on the ability of school principals for various types of technology platforms embedded in schools. The program's hallmark is the distribution of tablet computers to pupils and the provision of information and communication technology (ICT) learning tools to schools. The industrial revolution 4.0 is being prepared for through the adoption of new learning in schools, or "school digitalization" (Lase, 2019) (Taufikurrahman, 2021). Student-centered, multimedia, collaborative work, information exchange, critical thinking, and well-informed decision-making are the traits of this new learning (Nurhadi, 2020) (Inganah et al., 2023).

For the 21st century generation to be able to adapt to the rapidly evolving information technology that has impacted many facets of life, including the educational process that offers opportunities for students to master information technology, particularly computers, 21st century leadership is a new style of leadership. The Digital Leadership Model, then, is a situational leadership model used by the Principal to respond to educational developments based on the current situation (Sudika, 2020), with a policy-making technique in the form of setting school standards to suit the 21st Century education concept, with the aim of preparing high-quality and competitive schools, through the programs and developments being carried out to build a school ecosystem with the integration of technology.

Articles were further grouped based on study characteristics or moderator factors, such as year of publication, degree of education, sample size, type of research, and research location, by applying inclusion criteria for pertinent studies. The following will be discussed in detail using predetermined criteria.

1. Research Year

In this systematic review analysis, research publications published between 2019 and 2023 served as the studies' data sources. Figure 2 shows specifics regarding the distribution of primary studies from 2019 to 2023.

Table 2. Research Year Data

Criteria		Number of Article
Research Years	2019	7
	2020	9
	2021	10
	2022	13
	2023	11

Figure 2. Research data by year

The data gathered is shown in Figure 2 and is based on the outcomes of a review of many research publications for the previous five years, specifically from 2019 to 2023. According to Figure 1, there has been a huge increase in digital leadership research from year to year. The least amount of study on digital leadership was done in 2019 (7 articles), while the most was done in 2023 (13 articles). Therefore, it may be inferred that there is a growing need for discussion and improvement regarding the urgency and importance of digital leadership.

that there is a growing need for discussion and improvement regarding the urgency and importance of digital leadership.Due to the expanding use of digitization in the field of education and the ongoing changes in how schools are run, research on the digital leadership of school principals is growing every year (Lestyaningrum et al., 2022). School principals, according to (Muspawi, 2020) must comprehend how digital technology may be used to enhance teaching and learning, foster effective staff and student communication, and efficiently manage school resources. The goal of this study is to pinpoint successful leadership approaches for addressing technology advancements, raising educational standards, and accomplishing modern-day educational objectives. The role of school principals as digital leaders is receiving more attention, and continuing research offers education practitioners and policymakers a strong knowledge base to help them educate school principals to lead adaptive and innovative schools in the digital age.

Due to the rapid advancement of digital technology and changes in the demands and environments of leadership in the digital age, the research year is crucial and significant in the field of principal digital leadership study. Researchers can follow the most recent advancements and trends in digital leadership practices by keeping an eye on the year of the research (Sabrina, 2023). For instance, research completed more recently may reflect technology that are more current and pertinent to today's setting. Digital technologies utilized in education and leadership are always evolving. The years of study taken into account can thus give insight into the current situation in terms of the main developments and practices in digital leadership.

Researchers can also observe changes in the needs and context of principals' digital leadership when accounting for the research year. Leaders must adapt to new difficulties as they appear as a result of the transformation that digital technologies have brought about in education (Kennedy, 2020). The digital leadership of school administrators is impacted by changes in technology, educational regulations, and social and economic factors, according to new research. This has made it possible for scholars to have a more thorough grasp of the difficulties principals confront when leading digitally and to pinpoint efficient practices and solutions for coping with this transformation. Therefore, it's crucial to consider the years of primary digital leadership study to determine the relevance and actuality of the research findings to the contemporary realities of digital leadership.

2. Educational Level

There are three groups based on educational level: elementary school, junior high school, and senior high school. According to educational level, the number of studies is displayed graphically in Figure 3 as follows:

Table 3. Educational Level Data

Criteria		Number of Article
Educational Level	Elementary School	12
	Junior High School	13
	Senior High School	15

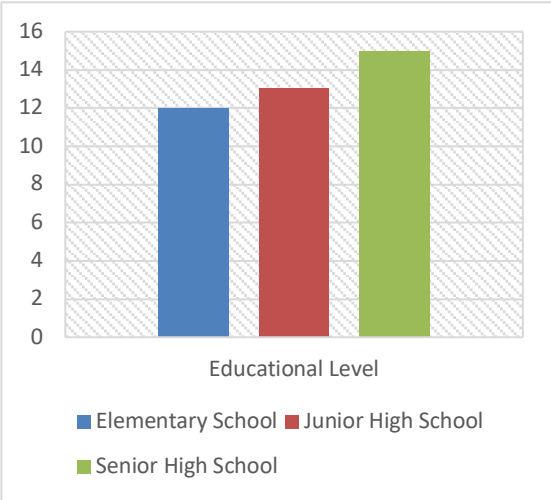

Figure 3. Research data by Level

Figure 3 indicates that there have been less studies on digital leadership completed and published at the elementary school level than there have been at the high school level, where there have been a total of 15 papers. Because digital leadership is a highly crucial ability that every leader should develop and own, regardless of the degree of education he leads, this must be a concern. This is in line with research (Hamzah et al., 2021) that suggests that in order to provide direction and guidance to lead digital development in their schools and spread this practice to the school learning environment, today's school leaders must work to fill any gaps in their technological knowledge and skills.

Given the growing importance of digital technology in our lives today, all leaders—regardless of the educational level they oversee must embrace digital leadership. Leaders today must have a solid understanding of technology and be able to use it effectively to accomplish organizational goals in the ever-evolving digital age (Budiatmaja et al., 2022) (Goreta et al., 2022). With creativity and innovation, leaders can take advantage of the opportunities and difficulties presented by digitization (Wujarso et al., 2023). Understanding digital technologies allows leaders to make intelligent decisions on how to integrate technology into corporate strategy, increase operational effectiveness, and improve internal communication and collaboration.

Additionally, customer behavior shifts and emerging trends that are more and more dependent on technology make digital leadership crucial (Ngamal & Perajaka, 2022). Organizations must adjust to this shifting environment if they want to stay competitive. Leaders will be better able to spot new possibilities, foresee market shifts, and create pertinent strategies if they have a working knowledge of technology and the skills to innovate utilizing digital technologies (Aulia & Aslami, 2023). In order to deal with the difficulties and competitiveness brought on by the digital revolution, leaders can direct their businesses in a more inventive and adaptable direction with the help of digital leadership. Therefore, to ensure the success and sustainability of the business in the digital era, digital leadership is crucial for every leader, regardless of the degree of education they oversee.

Due to the variations in demands, competences, and experience that are connected with different levels of education, education level is a significant and influential component in study on primary digital leadership. Depending on the level of education the principal is leading, digital leadership may have varied effects (Sriyanto et al., 2022). For instance, incorporating digital technologies into curriculum and learning that are age-appropriate for children may be a difficulty for principals at the elementary school level. Principals at secondary or tertiary institutions of higher learning, on the other hand, could have to oversee the installation of more sophisticated digital tools, such online learning platforms or the use of data analytics to enhance academic results.

The comprehension and requirements of school principals in relation to the employment of digital technology are also influenced by their educational level (Purnasari & Sadewo, 2021). Principals at the primary or secondary education levels may need to learn the fundamentals of technology and implementation strategies appropriate to their context, whereas

principals at the tertiary education level may need to understand current trends in technology and their applications in higher education. In order to comprehend the distinctions in the problems, needs, and practices of digital leadership that are pertinent to each level of education, research on digital leadership for school principals must pay attention to the degree of education. By considering the level of education, research can provide more specific and contextual insights in developing effective digital leadership practices at every level of education.

3. Sample Size

Research related to research sample size is categorized by researchers into 2 categories, namely research with a sample size < 30 and research with a sample size >= 30. This can be seen in detail in Figure 4 below:

Table 4. Sample Size Data

Criteria		Number of Article
Sample Size	< 30	14
	>= 30	26

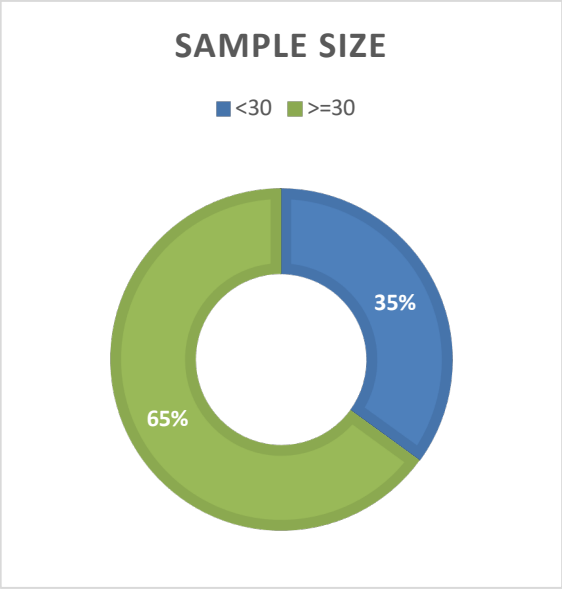

Figure 4. Research data by Sample size

Based on graph 4, it is clear that a sample with a total of about 30 people makes up the majority of the research on digital leadership. The population being researched is said to be in the shape of a mini (miniature population) or the sample is a sample or a portion of that population. The sample must, among other things, be representative (representative) of the population in order to satisfy the requirement (Danuri et al., 2019).

Because it can affect the validity and generalizability of study findings, sample size is a crucial and influential factor in principal digital leadership research. A significant sample size in research offers enough statistical power to generate valid results (Vebrianto et al., 2020). An sufficient sample size allows researchers to gather data that accurately represents the variation present in the primary population while studying principal digital leadership. A more precise and trustworthy statistical analysis may be performed to pinpoint connections, patterns, and trends in the context of digital leadership with a large enough sample size. This increases the findings' credibility and enables them to be applied to a larger group of principals.

To have a better representation of various school kinds, contexts, and principal characteristics, proper sample sizes are also crucial in principal digital leadership research. A small sample size in a study can have limited results and may not accurately represent the variation in the main population (Firmansyah, 2022). Researchers have a higher chance of accurately capturing a wide range of demographics, educational levels, experiences, and school environments by employing a bigger sample size. This will improve school principals' general comprehension of digital leadership and make it possible to pinpoint the crucial elements that make it successful in various educational situations.

4. Type of Research

Three categories—qualitative, quantitative, and mix-method—are used for grouping based on the type of research. Researchers divide descriptive qualitative research, case studies, and phenomenology under the heading of qualitative research. Figure 5 below provides more information on the distinctions between descriptive, experimental, quasi-experimental, and correlational quantitative research:

Table 5. Type of Research Data

Criteria		Number of Article
Type of Research	Qualitative	14
	Quantitative	17
	Mix Method	9

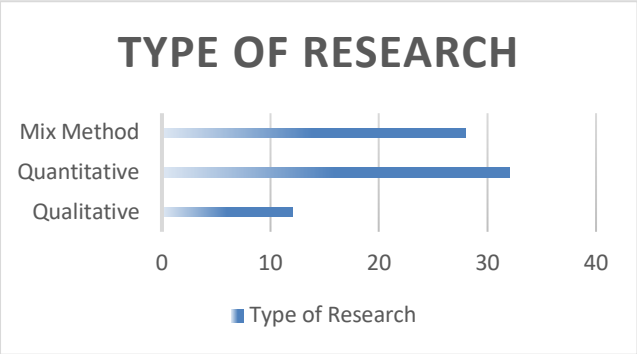

Figure 5. Research data by Type of Research

According to Figure 5, research on digital leadership itself primarily employs quantitative research techniques as opposed to qualitative techniques and a combination of techniques. This explains why qualitative research itself focuses on quality, data processing methods, data collection processes that are flexible, and interactions are carried out not necessarily with direct activities used. It also explains why researchers prefer quantitative research and the results of research that are more detailed and in-depth.

The research methodology utilized in the study of digital leadership for school principals is crucial and significant since it can guarantee the accuracy and dependability of study results. Appropriate research methodologies enable scientists to create high-quality studies, gather pertinent data, and assess it objectively (Nasrudin, 2019). Careful research techniques can assist in gathering solid information concerning the connection between digital leadership practices and school performance in the context of digital leadership for school administrators. Researchers may ensure that their conclusions are supported by accurate and reliable data by employing valid and reliable research methodologies. This creates a solid foundation for the creation of efficient digital leadership practices and policies.

Additionally, effective research methodologies provide for accurate research question responses and in-depth understanding of the principal's digital leadership (Roosinda et al., 2021). In order to gather diverse and thorough data, a variety of research methodologies, including case studies, questionnaires, interviews, and observations, can be used. Researchers can get a thorough grasp of how digital leadership is applied and affects the educational environment by using the right approaches (D. Dasmo et al., 2021). Additionally, effective research methodologies enable researchers to properly evaluate and interpret data (Rifa'i, 2023), leading to a deeper comprehension of the critical elements that affect the effectiveness of school principals' digital leadership. Thus, good research methods play an important role in producing meaningful and relevant findings for practitioners, policy makers and other researchers in the field of school principal digital leadership.

5. Research Location

Researchers categorize information on the distribution of studies based on demographics connected to digital leadership based on the nation where the research was conducted. The following Figure 6 shows this:

Table 6. Research Year Data

Criteria		Number of Article
Research Location	Palu	1
	Jakarta	3
	Bandung	4
	Pekanbaru	2
	Cirebon	2
	Pasaman	1
	Semarang	2
	Bali	2
	Palembang	2
	Pontianak	1
	Yogyakarta	4
	Malang	3
	Medan	2
	Padang	3
	Makasar	2
	Aceh	2
	Balik Papan	1
	Surabaya	3

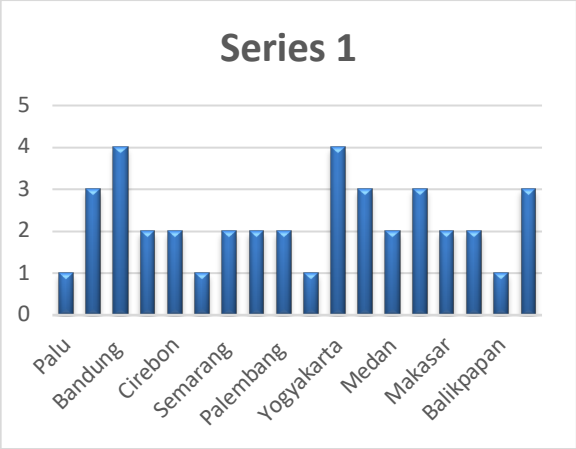

Figure 6. Research data by Research Location

According to Figure 6, there has been much research on digital leadership in a number of Indonesian locations. While the island of Java has been the subject of the most studies on digital leadership by researchers. This explains why leaders in the contemporary era of scientific and technological advancement must exhibit digital leadership as a talent.

Because each place has an own background, culture, and educational policies, research locations are crucial and influential in the field of principal digital leadership research. Environmental elements that vary by region, such as the availability of technology, accessibility, and the degree of acceptability of digital innovation, can have an impact on digital leadership (Kusumaningrum et al., 2020). In order to comprehend these distinctions and uncover particular practices and difficulties related to digital leadership of school principals in various areas, researchers must pay attention to research sites (Siraj, 2022). The applicability and generalizability of research findings in the context of digital leadership for school principals globally can also be better understood by paying attention to the varied research locations.

Stakeholder participation and engagement in the main research on digital leadership can also be influenced by the research location. In order to acquire a thorough understanding of participants' experiences and perceptions surrounding digital leadership, stakeholders like school administrators, instructors, and students must be included in the study. Researchers can get a variety of viewpoints and experiences from various groups of stakeholders by selecting a variety of research settings. This will produce more contextualized and pertinent findings and give a more complete view of school principals' digital leadership approaches. In order to comprehend contextual distinctions and obtain deeper and more insightful understanding of the impact of digital leadership in diverse places, it is crucial to pay attention to research sites in school principals' digital leadership research (Yanto et al., 2023).

CONCLUSION

Based on the findings and analysis provided above, it can be concluded that research on digital leadership has attracted considerable interest, particularly in recent years, with the quantitative method being the approach most frequently employed by researchers from 2019 through 2023. The majority of the study's sample size was greater than or equal to 30 and it was done at the senior high school level. Numerous locations in Indonesia have conducted considerable research on digital leadership, and the findings indicate that this research has had a good effect.

This research offers important insights into how digital leadership has been used in the context of education in Indonesia, it can be inferred based on the Systematic Literature Review (SLR) about the implementation of digital leadership for school principals in Indonesia. According to this study, the adoption of digital leadership varies greatly depending on the culture, technological environment, and legal framework of each nation. Additionally, this study identifies best practices for fostering digital leadership in the field of education. These results give practitioners and decision-makers in the education sector a strong foundation on which to build strategies and regulations that will allow Indonesia to fully utilize the promise of digital technology for improved learning and efficient school management. Future researchers are advised to be able to do in-depth research with a larger population, including universities and other institutions.

REFERENCE LISTS

Adha, L. A. (2020). Digitalisasi Industri Dan Pengaruhnya Terhadap Ketenagakerjaan Dan Hubungan Kerja Di Indonesia. *Jurnal Kompilasi Hukum*, *5*(2), 267–298.

Aisa, A., & Lisvita, L. (2020). Penggunaan Teknologi Informasi dalam Pembelajaran Online Masa Covid-19. *JoEMS (Journal of*

Education and Management Studies), *3*(4), 47–52.

Akbar, A., & Noviani, N. (2019). Tantangan dan solusi dalam perkembangan teknologi pendidikan di Indonesia. *Prosiding Seminar Nasional Program Pascasarjana Universitas Pgri Palembang*.

Alam, T. G., Antony, A. L. N., Hotama, K. V., & Kuswandi, S. S. (2019). Revolusi industri keempat: Akhir dari buruh di seluruh dunia. *Jurnal Hubungan Internasional*, *12*(2), 229–244.

Amalia, I. (2020). Menggunakan Teknologi Informasi Dan Komunikasi (TIK) Dalam Proses Pembelajaran Di Sekolah Dasar. *Jurnal Pendidikan Dan Konseling (JPDK)*, *2*(2), 152–155.

Andriani, R., Hasyim, Dewi, R., Tantri, A., & Nurkadri. (2022). Educational Leadership in the Digital Age Leadership Education in the Digital Age. *Journal Coaching Education Sports*, *3*(2), 125–130. https://doi.org/10.31599/jces.v3i2.1154

Asyari, S. (2020). Supervisi Kepala Madrasah Berbasis Penilaian Kinerja sebagai Upaya Peningkatan Profesionalitas Guru. *JIEMAN: Journal of Islamic Educational Management*, *2*(1), 27–40.

Aulia, R., & Aslami, N. (2023). Peran Manajemen Perubahan Dalam Menghadapi Tantangan dan Mengoptimalkan Peluang di Era Digital. *Journal of Nusantara Economic Science*, *1*(2), 65–72.

Budiatmaja, B. S., Vebianto, T. A., & Sunardi, A. (2022). *Leadership In Digital Transformation [sumber elektronis]*. Penerbit KBM Indonesia.

Damayanti, D., & Nuzuli, A. K. (2023). Evaluasi Efektivitas Penggunaan Teknologi Komunikasi Dalam Pengajaran Metode Pendidikan Tradisional Di Sekolah Dasar. *Journal of Scientech Research and Development*, *5*(1), 208–219.

Danuri, P. P., Maisaroh, S., & Prosa, P. (2019). *Metodologi Penelitian Pendidikan*. Samudra Biru (Anggota Biru).

Dasmo, D., Notosudjono, D., Sunardi, O., & Binoardi, H. (2021). Analisis Indikator Kepemimpinan Teknologi Kepala Sekolah Sebagai Pemimpin Implementasi Teknologi Abad 21. *Idaarah: Jurnal Manajemen Pendidikan*, *5*(2), 240.

Dasmo, M. P. (2022). *Perilaku Inovatif Sebagai Pusat Pengembangan Profesional Guru Pada Era Digital*. Media Nusa Creative (MNC Publishing).

Fajri, I., Yusuf, R., & Yusoff, M. Z. M. (2021). Model pembelajaran project citizen sebagai inovasi pembelajaran dalam meningkatkan keterampilan abad 21. *Jurnal Hurriah: Jurnal Evaluasi Pendidikan Dan Penelitian*, *2*(3), 105–118.

Firmansyah, D. (2022). Teknik Pengambilan Sampel Umum dalam Metodologi Penelitian: Literature Review. *Jurnal Ilmiah Pendidikan Holistik (JIPH)*, *1*(2), 85–114.

Goreta, G., Japar, M., Sukardjo, M., Bahriah, E. S., & Saepuloh, L. (2022). Pengembangan Karakteristik, Kapabilitas dan Pilar Kepemimpinan Digital pada Lembaga Pendidikan. *Jurnal Basicedu*, *6*(6), 10369–10382.

Hamzah, N. H., Nasir, M. K. M., & Wahab, J. A. (2021). The Effects of Principals' Digital Leadership on Teachers' Digital Teaching during the COVID-19 Pandemic in Malaysia. *Journal of Education and E-Learning Research*, *8*(2), 216–221.

Hapudin, H. M. S. (2021). *Teori belajar dan pembelajaran: menciptakan pembelajaran yang kreatif dan efektif*. Prenada Media.

Hartanto, S., & Purwanto, S. (2019). *Supervisi dan penilaian kinerja guru*.

Hartati, S., Nurdin, D., & Arisandi, D. (2023). Edukasi Kepemimpinan Digital pada Pembelajaran di Sekolah Menengah Kejuruan Abdurrab Pekanbaru. *Jurnal Pengabdian Nasional (JPN) Indonesia*, *4*(2), 238–244.

Inganah, S., Darmayanti, R., & Rizki, N. (2023). Problems, solutions, and expectations: 6C integration of 21 st century education into learning mathematics. *JEMS: Jurnal Edukasi Matematika Dan Sains*, *11*(1), 220–238.

Jannah, R., Rosyidin, A. M., Nurmala, T., Yuningsih, N., & Yenny, E. (2023). Kepemimpinan di Era Digital dan Implementasinya di Lembaga Pendidikan. *Jurnal Syntax Admiration*, *4*(2), 264–269.

Kalalo, D. K. R., Tambingon, H. N., & Rotty, V. N. J. (2022). Tingkat Penggunaan Teknologi Informasi dan Dampaknya pada Kreativitas Pembelajaran Guru-guru Sekolah Luar Biasa di Provinsi Sulawesi Utara Indonesia. *Journal on Teacher*

Education, *4*(2), 41–47.

Katuuk, D. A., Rotty, V. N. J., Lengkong, J. S. J., & Rawung, R. K. S. (2021). Pemanfaatan Teknologi Informasi dalam Pembelajaran Online di Masa Pandemic Covid-19 Tantangan Atau Peluang? *Media Manajemen Pendidikan*, *4*(1), 160–171.

Kennedy, P. S. J. (2020). *Tantangan Pendidikan Tinggi Menghadapi Perkembangan Teknologi Digital Dalam Era VUCA*.

Kusumaningrum, D. E., Sumarsono, R. B., & Gunawan, I. (2020). Pengaruh kepemimpinan pembelajaran, kepemimpinan perubahan, kepemimpinan spiritual, budaya sekolah, dan etika profesi terhadap kinerja mengajar guru. *JMSP (Jurnal Manajemen Dan Supervisi Pendidikan)*, *4*(3), 198–219.

Laratmase, P. (2023). Bab 3 Teknologi Informasi Dan Keunggulan Bersaing. *Sistem Informasi Manajemen*, 23.

Lase, D. (2019). Pendidikan di era revolusi industri 4.0. *SUNDERMANN: Jurnal Ilmiah Teologi, Pendidikan, Sains, Humaniora Dan Kebudayaan*, *12*(2), 28–43.

Lestyaningrum, I. K. M., Trisiana, A., Safitri, D. A., & Pratama, A. Y. (2022). *Pendidikan Global Berbasis Teknologi Digital di Era Milenial*. Unisri Press.

Majir, A. (2020). *Paradigma baru manajemen pendidikan abad 21*. Deepublish.

Maksum, H. (2022). Kepemimpinan, Tranformasi Digital Dan Mindset Dalam Meningkatkan Mutu Pendidikan. *ZONAsi: Jurnal Sistem Informasi*, 80–89.

Mardhiyah, R. H., Aldriani, S. N. F., Chitta, F., & Zulfikar, M. R. (2021). Pentingnya keterampilan belajar di abad 21 sebagai tuntutan dalam pengembangan sumber daya manusia. *Lectura: Jurnal Pendidikan*, *12*(1), 29–40.

Mukhid, M. P. (2023). *Disain Teknologi Dan Inovasi Pembelajaran Dalam Budaya Organisasi Di Lembaga Pendidikan*. Pustaka Egaliter. Com.

Mukhlasin, A. (2021). Kepemimpinan Kepala Sekolah Kunci Keberhasilan dalam Pencapaian Kualitas Pendidikan. *Journal Of Administration and Educational Management (ALIGNMENT)*, *4*(2), 193–199.

Mulyasa, H. E. (2022). *Manajemen dan kepemimpinan kepala sekolah*. Bumi Aksara.

Musfah, J. (2022). *Kepemimpinan Pendidikan: Teori Dan Kebijakan*. Prenada Media.

Muspawi, M. (2020). Strategi menjadi kepala sekolah profesional. *Jurnal Ilmiah Universitas Batanghari Jambi*, *20*(2), 402–409.

Nasrudin, J. (2019). *Metodologi Penelitian Pendidikan: Buku ajar praktis cara membuat penelitian*. Pantera Publishing.

Nasution, I., Azhari, A., Ramadhani, I., Gusrina, A., Rozzaqiyah, Z., Ikhsan, M., & Hadinata, R. (2022). Strategi Kepala Sekolah Dalam Penerapan Pembelajaran Era Digital Di Sekolah Nadrisatul Ikbar. *JUPE: Jurnal Pendidikan Mandala*, *7*(4).

Ngamal, Y., & Perajaka, M. A. (2022). Penerapan Model Manajemen Risiko Teknologi Digital Di Lembaga Perbankan Berkaca Pada Cetak Biru Transformasi Digital Perbankan Indonesia. *Jurnal Manajemen Risiko*, *2*(2), 59–74.

Nurhadi, A. (2020). E-Magazine sebagai Media Pembelajaran Teks Fiksi dan Nonfiksi (Studi Kasus pada Siswa SMP Islam Al-Azhar 38 Wonosari). *Prosiding Seminar Nasional IKIP Budi Utomo*, *1*(01), 861–871.

Paramansyah, H. A., & SE, M. M. (2020). *Manajemen Pendidikan Dalam Menghadapi Era Digital*. Arman Paramansyah.

Purnasari, P. D., & Sadewo, Y. D. (2021). Strategi Pembelajaran Pendidikan Dasar di Perbatasan Pada Era Digital. *Jurnal Basicedu*, *5*(5), 3089–3100.

PURWOKO, S., ROKHMAN, A., & TOBIRIN, T. (2022). *E-Leadership: Konsep Dan Pengaruh Kepemimpinan Digital Dalam Transformasi Digital Di Sektor Pemerintahan*.

Rifa'i, Y. (2023). Analisis Metodologi Penelitian Kulitatif dalam Pengumpulan Data di Penelitian Ilmiah pada Penyusunan Mini Riset. *Cendekia Inovatif Dan Berbudaya: Jurnal Ilmu Sosial Dan Humaniora*, *1*(1), 31–37.

Roosinda, F. W., Lestari, N. S., Utama, A. A. G. S., Anisah, H. U., Siahaan, A. L. S., Islamiati, S. H. D., Astiti, K. A., Hikmah, N., & Fasa, M. I. (2021). *Metode penelitian kualitatif*. Zahir Publishing.

Sabrina, C. (2023). Scoping Review: Tren Terbaru dalam Manajemen Sumber Daya Manusia di Era Digital pada Tahun 2012-

2022. *Bulletin of Management and Business*, *4*(1), 66–72.

Sihaloho, B. (2022). Kepemimpinan Kepala Sekolah Dalam Mewujudkan Merdeka Belajar Di Smk Negeri 1 Patumbak. *Jurnal Guru Kita PGSD*, *6*(2), 35–41.

Siraj, B. (2022). STUDI KASUS KEPEMIMPINAN SEKOLAH IDEAL. *Manajemen Kepemimpinan Pendidikan Kontemporer*.

Sriyanto, S., Kartono, K., & Sembiring, M. G. (2022). Gaya Kepemimpinan Transformasional Kepala Sekolah Dasar Menyongsong Merdeka Belajar di Era Industri 4.0. *Jurnal Basicedu*, *6*(6), 10259–10266.

Sudika, I. W. (2020). Kepemimpinan kepala sekolah dasar pada era revolusi industri 4.0 dan pandemi Covid 19. *Edukasi: Jurnal Pendidikan Dasar*, *1*(2), 113–124.

Taufikurrahman, T. (2021). Kepemimpinan Kepala Sekolah Di Era Digital. *Proceeding: Islamic University of Kalimantan*.

Timan, A., Mustiningsih, M., & Imron, A. (2022). Digital Leadership Kepala Sekolah Hubungannya dengan Kinerja Guru dan Kompetensi Siswa Era Abad 21. *JAMP: Jurnal Administrasi Dan Manajemen Pendidikan*, *5*(4), 323–333.

Tulungen, E. E. W., Saerang, D. P. E., & Maramis, J. B. (2022). Transformasi Digital: Peran Kepemimpinan Digital. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, *10*(2).

Ulfah, U., Supriani, Y., & Arifudin, O. (2022). Kepemimpinan Pendidikan di Era Disrupsi. *JIIP-Jurnal Ilmiah Ilmu Pendidikan*, *5*(1), 153–161.

Vebrianto, R., Thahir, M., Putriani, Z., Mahartika, I., & Ilhami, A. (2020). Mixed Methods Research: Trends and Issues in Research Methodology. *Bedelau: Journal of Education and Learning*, *1*(2), 63–73.

Waruwu, M. (2021). Kepemimpinan Kepala Sekolah dalam Perspektif Servant Leadership. *Improvement: Jurnal Ilmiah Untuk Peningkatan Mutu Manajemen Pendidikan*, *8*(2), 138–153.

Wujarso, R., Pitoyo, B. S., & Prakoso, R. (2023). Peran Kepemimpinan Digital Dalam Era Digital. *JISAMAR (Journal of Information System, Applied, Management, Accounting and Research)*, *7*(1), 1–9.

Yaminah, D., Rukmana, A., Mariyam, L., Armila, N., Mujahidin, M., & Khaerul, K. (2023). Kepemimpinan Kepala Sekolah Islam di Era Transformasi Digital. *Jurnal Syntax Admiration*, *4*(1), 47–59.

Yanto, A., Dianto, A., Bastian, D., & Kurniawan, M. E. (2023). Strategi Kepala Sekolah Dalam Meningkatkan Mutu Pendidikan Di Pondok Pesantren Darussalam Kepahiang. *Educational Leadership: Jurnal Manajemen Pendidikan*, *2*(2), 190–210.

Yustian, R., Ramdani, A. D., Sopandi, I., Suharyanto, E., Yusuf, Y., Gaffar, A., & Paramansyah, A. (2023). Pengembangan Kepemipinan Sekolah Dalam Menghadapi Perubahan dan Kompleksitas Era 4.0. *Reslaj: Religion Education Social Laa Roiba Journal*, *5*(6), 2831–2839.

Zamista, A. A. (2022). Online Assessment as an Alternative Learning Assessment in the Digital Era: A Systematic Literature Review. *INSANIA: Jurnal Pemikiran Alternatif Kependidikan*, *27*(2).

Ziaulhaq, W. (2022). Pola Kepemimpinan Kepala Madrasah Dalam Menjaga Kualitas Kerja Guru Di Massa Pandemi Covid 19 Pada Madrasah Aliyah Swasta Persiapan Negeri Besitang. *Jurnal Manajemen Pendidikan Islam Al-Munadzomah*, *2*(1), 1–8.