Nidhomul Haq: Jurnal Manajemen Pendidikan Islam **E-ISSN: 2503-1481**
Accredited Number: 79/E/KPT/2023 pp: 530-541
DOI: https://doi.org/10.31538/ndhq.v10i2.165
Journal Homepage: https://nidhomulhaq.uacmjk.ac.id/index.php/ndh/index
Vol 10 Issue (2) 2025

The Influence of School Management Digitalization and Principals' Professional Competence on School Quality in Public Junior High Schools in Weleri Region

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Received: 09-05-2025 Revised: 01-08-2025 Accepted: 04-08-2025

Article Info

Keywords:
Digitalization of School Management,
Principals' Professional Competence,
School Quality

Abstract

School quality is an important indicator in improving the quality of education and is strongly influenced by the effectiveness of school management and the professionalism of school principals. Based on the data from the 2023-2024 Education Report Card in Weleri region public junior high schools, there has been a decline in several dimensions of school quality, reflecting the suboptimal management and leadership competence of school principals. One of the causes is the weak mastery of technology and the inability of principals to identify the needs of teachers to improve student abilities. The purpose of this study is to examine the effects of digitalization of school management and principals' professional competence on school quality, both individually and in combination. The data in this study were collected through the distribution of questionnaires using a Likert scale, in accordance with the quantitative approach applied. The research sample was 119 teachers from a total population of 169 teachers in Weleri Region Public Junior High School. The analysis shows that the digitalization of school management has an effect of 76.2% on school quality, with a correlation score of 0.873. The principal's professional competence affects 75.5%, with a correlation of 0.869. Simultaneously, the two variables had a 79.9% effect on school quality, with a correlation of 0.864. The findings confirm that digitalization and leadership professionalism are crucial in improving education quality. The implications of the results of this study are expected to serve as a basis for policy makers and school principals in strengthening digital management and professional development.

Kata kunci:
Digitalisasi Manajemen Sekolah,
Kompetensi Profesional Kepala Sekolah,
Kualitas Sekolah

Abstrak

Mutu sekolah merupakan indikator penting dalam peningkatan kualitas pendidikan dan sangat dipengaruhi oleh efektivitas manajemen sekolah serta profesionalisme kepala sekolah. Berdasarkan data Rapor Pendidikan 2023–2024 di SMP Negeri Wilayah Weleri terjadi penurunan pada beberapa dimensi mutu sekolah, mencerminkan belum optimalnya pengelolaan dan kompetensi kepemimpinan kepala sekolah. Salah satu penyebabnya adalah lemahnya penguasaan teknologi dan ketidakmampuan kepala sekolah dalam mengidentifikasi kebutuhan guru untuk meningkatkan kemampuan siswa. Tujuan dari penelitian ini adalah untuk menguji efek digitalisasi manajemen sekolah dan kompetensi profesional kepala sekolah terhadap mutu sekolah, baik secara individu maupun kombinasi. Data dalam penelitian ini dikumpulkan melalui penyebaran kuesioner yang menggunakan skala Likert, sesuai dengan pendekatan kuantitatif yang diterapkan. Sampel penelitian sebanyak 119 guru dari total populasi 169 guru di SMP Negeri Wilayah Weleri. Hasil analisis menunjukkan bahwa digitalisasi manajemen sekolah berpengaruh sebesar 76,2% terhadap mutu sekolah, dengan skor korelasi 0,873. Kompetensi profesional kepala sekolah berpengaruh sebesar 75,5%, dengan korelasi 0,869. Secara simultan, kedua variabel berpengaruh sebesar 79,9% terhadap mutu sekolah, dengan korelasi 0,864. Temuan ini menegaskan bahwa digitalisasi dan profesionalisme kepemimpinan sangat krusial dalam meningkatkan mutu pendidikan. Implikasi hasil penelitian ini diharapkan dapat menjadi dasar bagi pengambil kebijakan dan kepala sekolah

INTRODUCTION

Schools have a strategic role in producing quality human resources through a planned and dynamic education process. Including spiritual aspects, personality, intelligence, morals, and skills. (Aprilianto et al., 2025) emphasizes that quality education is that which is able to free students from various forms of limitations, while (Akbar et al., 2023) emphasizing the importance of the role of teachers in providing quality educational services through improving competence.

According to (Abbas, 2020; Darling-Hammond et al., 2006), school quality depends on the effectiveness of well-organized programs. Schools as organizations must be able to process input into output that has added value through a structured educational process (Hendradi, 2024; Scheerens, 1990). This can only be achieved through systematic curriculum implementation, competent teacher involvement, adequate facilities and infrastructure, and effective administration and financial management. The quality of schools in the SMP Negeri environment in the Weleri Region, on average still needs improvement. Based on data from the education report cards owned by each school, it is known that there are still fluctuations in improving quality. This happens because it can be seen from the education report cards of each school which describe the values in each dimension.

Table 1. Cumulative Quality Report of Public Middle Schools in the Weleri Region

No	School name	Indicator	Mark		Achievements		Information
			Year 2023	Year 2024	Year 2023	Year 2024	
1.	Rowosari 1 State Junior High School	Literacy Skills	82.22%	91.11%	Good	Good	Up 8.89%
		Numeracy Ability	71.11%	84.44%	Good	Good	Up 13.33%
		Character	54.38%	56.65%	Good	Good	Up 2.27%
		Quality of Learning	61.43%	62.78%	Good	Good	Up 1.35%
		Reflection and Improvement	57.8%	66.47%	Good	Good	Up 8.67%
		Instructional Leadership	57	65.26%	Good	Good	Up 8.26%
		School Safety Climate	66%	72.38	Good	Good	Up 6.38%
		Citizen Participation	69.55%	77.99	Good	Good	Up 8.44
2.	Weleri 1 State Junior High School	Literacy Skills	88.89%	99.38%	Good	Good	Up 4.44
		Numeracy Ability	71.11%	77.78%	Currently	Good	Up 6.67
		Character	59.54%	62.65%	Good	Good	Up 3.11
		Quality of Learning	66.3%	69.34%	Good	Good	Up 3.04
		Reflection and Improvement	66.43%	65.04%	Currently	Currently	Down 1.39
		Instructional Leadership	62.61%	63.6%	Good	Good	Up 0.99
		School Safety Climate	70.26%	77.65%	Good	Good	Up 7.39
		Citizen Participation	71.95%	80.79%	Good	Good	Up 8.84
3.	State Junior High School 2 Weleri	Literacy Skills	60%		Currently		
		Numeracy Ability	34.09%	40.87%	Not enough	Not enough	Up 6.78%
		Character	49.99%	39.13%	Currently	Currently	Down 10.86

No	School name	Indicator	Mark		Achievements		Information
			Year 2023	Year 2024	Year 2023	Year 2024	
		Quality of Learning	56.44%	50.38%	Currently	Currently	
		Reflection and Improvement	62.3%	56.79%	Good	Good	Down 5.51
		Instructional Leadership	60.62%	54.04%	Good	Good	Down 6.58
		School Safety Climate	64.13%	57.02%	Good	Good	Down 7.11
		Citizen Participation	66.23%	49.08%	Currently	Currently	Down 17.15
4.	State Junior High School 3 Weleri	Literacy Skills	80%	72.17%	Good	Good	Up 20.0
		Numeracy Ability	62.22%	95.56%	Good	Good	Up 33.34
		Character	54.5%	55.16%	Currently	Currently	Up 0.66
		Quality of Learning	62.63	62.43%	Good	Good	Down 0.20
		Reflection and Improvement	64.55%	66.13%	Good	Good	Up 1.58
		Instructional Leadership	62.58%	66.04%	Good	Good	Up 3.46
		School Safety Climate	69.98%	75.26%	Good	Good	Up 5.28
		Citizen Participation	74.6%	78.45%	Good	Good	Up 3.85

Source: ANBK Assessment Results 2023/2024

Based on the 2023 to 2024 education report card data, there is a decline in various dimensions measured, reflecting the lack of comprehensive improvement and consistency in the quality of education. Several schools have experienced a decline in the quality of learning which requires the active role of all elements of the school in improving the quality of learning. One of the causes of weak student numeracy is the lack of professional competence of the principal who has not been able to identify the needs of teachers to improve students' abilities in this field. (Akbar et al., 2023; Kartiko et al., 2024) emphasizes that the quality of education is determined by government support, effective principal leadership, and competent teacher performance. Therefore, a good education management strategy is needed to improve school quality.

The major transformation brought about by the industrial revolution 4.0 has also influenced the world of education. (Baba et al., 2024; Ghosh et al., 2018; Guo et al., 2013) explains that Intelligence engineering and the Internet of Things (IoT) have transformed the way humans and machines interact, significantly influencing connectivity patterns, including those within the learning environment. (Faizah et al., 2023) mentioned that technological developments present new opportunities and challenges in the education system, such as changes in learning methods and the preparation of curricula that are in accordance with industry needs. At present, the Ministry of Education and Culture is vigorously advancing the digitalization of education as a means to align with ongoing technological advancements (Kartiko et al., 2025). Schools are encouraged to use information technology to develop an internet-based education information system to improve the effectiveness and service of education.

Based on observations and unstructured interviews conducted by the researcher with one of the teachers at a Public Middle School in Weleri during the MGMP activity, it was found that there were still principals who had not mastered technology, both in administration and the

learning process. The student service system is still carried out manually due to the lack of competent management staff in the digital field. In addition, not all schools have websites that contain profiles and information services for the public, and low funding has an impact on limited digital facilities and infrastructure. This condition hinders the optimization of the implementation of digitalization of school management. Education plays an important role in facing the challenges of globalization, and the low quality of education can make society more easily eroded by the current of globalization. Improving the quality of education must be pursued in a dynamic and sustainable manner. In this context, the professionalism of school principals plays a crucial role, as outlined in Law No. 14 of 2005 concerning Teachers and Lecturers (Selviana et al., 2024). This law emphasizes that competence encompasses a combination of knowledge, skills, and behaviors that teachers or lecturers must possess in order to effectively carry out their professional responsibilities.

(Rostini et al., 2022) stated that the principal has an important role in realizing the vision, mission, and goals of education as a professional and collaborative leader with teachers. The principal is required to have managerial skills to empower all staff to be able to run the education system optimally. The professional competencies of the principal as stated in Perdirjen GTK No. 7327 of 2023 Article 4 include the ability to develop a vision and culture of learning, implement student-centered learning leadership, and manage resources effectively, transparently, and accountably. However, from interviews with English teachers, there are still principals who are not yet able to carry out student-based learning leadership, including in planning, implementation, and reflection (Ma`arif et al., 2025). Interaction and communication with parents are also still low because there are no services that support the role of parents in school development. In fact, some principals still solve problems without an adequate analytical and conceptual approach, just to avoid conflict, without a clear theoretical basis.

The researcher is interested in studying further through a study entitled "The Effect of Digitalization of School Management and Principal Professional Competence on School Quality in Junior High Schools in the Weleri Region". This study aims to analyze the extent to which digitalization of school management and principal professional competence have a partial or simultaneous effect on school quality. Theoretically, this study aims to enrich the existing literature on the digitalization of management and the competence of principals in enhancing the quality of education. Practically, the findings of this research are anticipated to offer tangible contributions to various stakeholders, such as the Education Office as a consideration in formulating policies to improve school quality, principals in improving their competence and implementing digital-based management, teachers in developing their professionalism and digital skills, and further researchers as a reference to expand similar studies by adding or modifying the variables studied.

METHODS

This study employ a quantitative approach, as explained by (Quick & Hall, 2015; Tacq, 2011) which defines quantitative research as a type of research that generates findings through statistical procedures or other methods of quantification. The type of research used is quantitative correlational (Bloomfield & Fisher, 2019; Steinkamp & Maehr, 1983). Opinion(Akbar et al., 2023) which states that Correlational research seeks to determine the relationship between two or more variables (Becker et al., 2016). In this study, the focus was on examining the relationship between the digitalization of school management and the professional competence of principals, and how

these factors influence the quality of schools in Public Middle Schools in the Weleri Region. The subjects of this study were teachers from Public Middle Schools in the area during the 2024/2025 academic year. Data was collected through questionnaires designed on a Likert scale (Albaum, 1997), where respondents were asked to select one of the provided answers to measure their attitudes or perceptions regarding the variables under investigation.

The population used in this study were teachers at Weleri Region State Middle Schools with a total of 169 teachers with details as in the following table:

Table 2. Number of Research Population

No	School name	Amount
1	Rowosari 1 State Junior High School	31
2	Weleri 1 State Junior High School	50
3	State Junior High School 2 Weleri	48
4	State Junior High School 3 Weleri	40
	Total	**169**

Source :https://dapo.kemdikbud.go.id/sp/3/032305, accessed 20 Sept 2024

In order to obtain better research results, a more accurate sampling technique is needed, namely one that truly represents the population. For this reason, the sample in this study was determined using the Slovin formula, as follows:

$$n = \frac{N}{1+Ne^2}$$

Information :

N = research population

n = sample taken from the research population

e = Margin of error or tolerance of inaccuracy in percent (%)

InThis research has a population (N) of 169 and an estimated margin of error of 5%, so the sample size that the researcher needs is:

$$n = \frac{N}{1+Ne^2}$$

$$n = \frac{169}{1+169(0{,}05^2)}$$

$$n = \frac{169}{1+169(0{,}0025)}$$

$$n = \frac{169}{1+0{,}42}$$

$$n = \frac{169}{1{,}42}$$

n = 119.01 rounded to 119

Based on the calculation results using the Slovin formula above, the value of n = 119.01 was rounded up to 119, so the number of samples in this study was 119 respondents.

After the data was collected, this study used data analysis techniques that included descriptive analysis and statistical analysis. Descriptive analysis was conducted to describe or describe data from each variable studied, such as digitalization of school management, professional competence of principals, and school quality. Furthermore, an analysis requirement test was performed to ensure that the data met the basic assumptions necessary before conducting hypothesis testing. Once these requirements were satisfied, the final stage involved hypothesis

testing, which aimed to determine whether there was a significant effect of the independent variables on the dependent variable. This process was crucial in answering the research questions outlined in the study.

RESULTS AND DISCUSSION

Results

A hypothesis is a provisional solution to the identified problem, which must be empirically tested for its validity. In this study, hypothesis testing was conducted using simple regression methods for the first three hypotheses, while the fourth hypothesis was tested using multiple regression techniques.

a. Simple Linear Regression

1) The Impact of Digitalization of School Management on School Quality

To find out how much influence the digitalization variable of school management (X1) has on school quality (Y), this can be seen in the following R Square model test:

Table 3. Results of the R Square Model Test of Digitalization of School Management (X2) on School Quality (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.873	0.762	0.760	2,487

Source: SPSS 26 Output (Processed Data)

Based on Table 4.16 above, the value obtained is$R\ Square$of 0.762. This value means that there is an influence of digitalization of school management (X1) on school quality (Y) of 76.2%, while 23.8% of school quality (Y) is influenced by other variables that were not examined in this study.

So it can be concluded that the digitalization of school management (X1) has a positive effect on school quality (Y) with a total effect of 76.2%, meaning that there is a strong effect between the digitalization of school management and school quality.

2) The Influence of Principal Professional Competence on School Quality

The third hypothesis to be tested in this study is the influence of the Principal's professional competence (X3) on School Quality (Y) at Weleri State Junior High Schools. The results of the simple regression test with the help of SPSS can be seen in the following table:

To find out how much influence the principal's professional competence variable (X3) has on school quality (Y), this can be seen in the following R Square model test:

Table 4. Results of the R Square Model Test of Principal Professional Competence (X3) on School Quality (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.869	0.755	0.760	2,487

Source: SPSS 26 Output (Processed Data)

Based on Table 4.20 above, the obtained R-Square value is 0.755. This indicates that 75.5% of the variation in school quality (Y) is influenced by the principal's professional competence (X2), while the remaining 24.5% is affected by other factors not examined in this study. According to

Therefore, it can be concluded that the principal's professional competence (X1) has a strong positive influence on school quality (Y), with a total influence of 75.5%.

b. Multiple Regression

The fourth hypothesis is with multiple regression analysis. Multiple regression analysis is used to test the effect of independent variables on the dependent variable, namely the effect of digitalization of school management (X1) and professional competence of the principal (X2) together on school quality (Y) at SMP Negeri in Weleri Region.

To find out how much influence the variables of digitalization of school management (X1) and professional competence of the principal (X2) have on school quality (Y), this can be seen in the following R Square model test:

Table 5. Summary Test of Digitalization of School Management (X1) and Teacher Professional Competence (X2) on School Quality (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.894	0.799	0.663	5,028

Source: SPSS 26 Output (Processed Data)

Based on Table 4.23 above, the obtained R-Square value is 0.799. This indicates that 79.9% of the variation in school quality (Y) can be explained by the combined effect of the digitalization of school management (X1) and the professional competence of the principal (X2). In other words, digitalization of school management (X1) and the professional competence of the principal (X2) together account for 79.9% of the variation in school quality, while the remaining 20.1% is influenced by other factors.

Based on the results and discussion above, it can be concluded that the combined influence of the digitalization of school management and the professional competence of the principal on school quality is 79.9%. This demonstrates a strong impact of these factors on the overall quality of the school.

Discussion

The Impact of Digitalization of School Management on School Quality

Based on the results of the research conducted, from 119 respondents who provided answers to the principal digitalization variable, the average value obtained was112.57with standard deviation17.83The maximum score is 140 and the minimum score is 85.The results of the research data description show that the digitalization of school management at SMP Negeri Wilyah Weleri is in a fairly good category. The supervision dimension is considered the lowest where it is considered that there are still teachers who have not mastered IT well so that they have difficulty in inputting their performance results online and the use of the online platform provided by the school for parents of students in the context of Q&A about school programs and activities is still not optimal.

Statistical analysis showed an unusually strong and significant correlation between school management digitalization and school quality. With a correlation coefficient (r) = 0.873 and p-value = 0.000 (less than 0.05), it can be concluded that the relationship between these two variables is positive and statistically significant. The t-test proves that school digitization partially has a significant effect on school quality (significance 0.000 < 0.10; t count 9.637 > t table 1.6587). The ANOVA test also supports this with F count (355.481) far exceeding F table (3.92) and significance

of 0.000 < 0.05. Furthermore, the digitalization of school management accounts for 76.2% of the variation in school quality (R Square = 76.2%), the rest is influenced by other factors.

The results of this study are reinforced by the results of research conducted(Akbar et al., 2023)which states that digitalization has played a significant role in improving the quality of learning and school management. The use of various digital platforms such as Google Classroom, Google Meet, and WhatsApp has facilitated the learning process, both online and face-to-face, and increased student involvement in learning activities. In addition, adequate facilities and infrastructure, such as laptops, projectors, and a stable internet network, support the smooth implementation of technology in learning. Digitalization also allows flexibility in learning, accelerates learning development, and supports the development of teacher professionalism. In addition, research (Adiele & Etamesor, 2024; Okoye, 2025; Taşdan et al., 2025) which states that school management can be made easier with the digitalization of schools. Some things that can be made easier with digitalization include: recording attendance, paying tuition fees, paying school employees, digital libraries, and others. In relation to the context of learning, digitalization is used to support the implementation of E-Learning.

The Influence of Teachers' Professional Competence on Teachers' Work Discipline

Based on the results of the research conducted, from 119 respondents who provided answers to the professional competency variable, the average value obtained was123.0727with standard deviation19.70284. The maximum score is 154 and the minimum score is 82. The results of the research data description show that the professional competence of the principal at the Weleri Region State MP is in the fairly good category. Dimensions Think analytically and conceptually the lowest so that the principal is still considered not optimal in providing solutions to problems faced by teachers. The principal tends to require teachers to solve their problems without providing any input.

The correlation between principals' professional competence and school quality is very strong ($r = 0.869$) and significant ($p < 0.05$), indicating a reliable positive relationship. The regression equation $\hat{Y} = 124.26 + 0.672X_3$ indicates that as the professional competence of school principals increases, school quality tends to improve. Both the t-test and ANOVA demonstrate that the influence of the professional competence of school principals on school quality is partially significant (t-test significance = 0.000 < 0.10; t-statistic 11.483 > t-table 1.6587) and simultaneously significant (ANOVA significance = 0.021 < 0.05; F-statistic 5.509 > F-table 3.92). Therefore, it can be concluded that the professional competence of school principals has a significant impact on school quality.

Based on the description above, the findings of this study strengthen the research conducted by the research (Berhe & Gebretensaye, 2021; Ibrahim et al., 2024; Thornberg, 2008) which states that when this professional competence is possessed by the principal, a conducive school environment will be created. When teachers are faced with a conducive school environment, their work methods or work enthusiasm will increase, so that the quality of students can increase. This managerial competence is also needed in managing school finances and also the relationship between the school and external parties such as the department, parents of students, and the community. This study is also in line with research(Akbar et al., 2023) with the results of the correlation test obtained the correlation coefficient of the Principal's professional competence to school quality 0.505 with a significance of 0.000. The correlation value of 0.505 indicates that the relationship between the Principal's professional competence and School Quality is included in the

"moderate" category. The F test shows a significance value of 0.000 and F count 60.930. The F table value is 3.05 so that F count> F table. So it can be concluded that there is an influence of the Principal's professional competence on School Quality. This is in line with the research conducted (Dinçer, 2024) with the research title The Influence of Principal Competence and Educator Competence on the Quality of Education.

The Influence of Digitalization of School Management and Professional Competence of School Principals on School Quality

Based on the results of the research conducted, from 119 respondents who provided answers to the school quality variable, the average value obtained was 134.7697 with standard deviation 21.29715 the maximum score is 168 and the minimum score is 84.The results of the research data description show that the quality of schools in Welei Region's State Middle Schools is in the fairly good category. The graduate dimension is considered the lowest so that there are still graduates who cannot continue to their favorite schools because their grades cannot compete with other schools.

The regression model shows that both school management digitization (X_1) and principal professional competence (X_2) positively and significantly affect school quality. A one-unit increase in school management digitalization increases school quality by 0.542, while a one-unit increase in principal professional competence increases school quality by 0.656 (with other variables held constant). The partial t-test confirmed the significance of the effect of both independent variables on school quality (significance < 0.05 and t count > t table for both). In addition, principals' professional competence (possibly other variables measured) also proved to significantly influence work discipline.

The calculated F value of 5.608 obtained from the ANOVA test exceeds the F table value of 3.92 (at $\alpha = 0.05$ and df = 2, 111). This is reinforced by the significance value of 0.000 which is below the threshold of 0.05. Therefore, the conclusion of this test is the rejection of Ho and acceptance of Ha. For the combined effect of school management digitalization (X1) and professional competence (X3) on school quality (Y) is 79.9%, as indicated by the R square value. The 20.1% of school quality is explained by other factors outside this study. This means that the influence of digitalization of school management and professional competence of the principal on school quality is strong.

The results of the above research strengthen the research conducted by (Akbar et al., 2023) where the research results state that digitalization requires the skills of a principal in leadership to be able to integrate technology in education and manage technological infrastructure in schools, improve their digital skills, encourage continuous professional development for teachers, make data-based decisions, use digital platforms to convey information, and be able to overcome various challenges due to digitalization through effective leadership. In addition, research (Machado & Chung, 2015; Razak et al., 2019) mentions the principal plays a critical role in communicating the vision of technology integration to stakeholders. The principal must be able to explain the vision clearly and convincingly, and be able to answer questions and concerns from stakeholders. The principal must also be able to demonstrate how technology integration can help the school achieve its goals.

CONCLUSION

The results of the study show that the digitalization of school management and the professional competence of the principal have a strong influence on school quality, both individually and together. The digitalization of school management greatly contributes to improving school quality, with the planning dimension as the most prominent aspect, while supervision is an aspect that needs to be improved. The professional competence of the principal also has a significant influence, especially in implementing student-centered learning leadership, although analytical and conceptual thinking skills are still weaknesses. When these two variables are combined, their influence on school quality is even stronger, with the curriculum frequency dimension showing the highest achievement and the graduate dimension the lowest.

Based on these results, it is recommended that principals improve supervision by going directly to the field, facilitating IT training for teachers, and socializing the Q&A platform to parents. Principals also need to strengthen analytical skills, team collaboration, and improve the quality of graduates through teacher training and student discipline enforcement. The implication is that low supervision, analytical skills, and quality of graduates can hinder the digitalization process and reduce public trust, even though digitalization and principal competence significantly affect school quality by up to 79.9%.

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