

Research Article

Various Factors that Influence the Successful Implementation of School Digitalization Policies

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Abstract.

School digitalization in Indonesia has been widely implemented in line with the 2020/2021 education transformation policy. Various factors are thought to support the success of digitizing the learning process, school management, and how people work in schools. This research aims to determine various factors that positively influence the successful implementation of school digitalization at Junior High Schools (SMP) and Madrasah Tsanawiyah (MTs). This research uses a quantitative cause-and-effect approach with a questionnaire distributed online. The research was conducted in semester 1 of 2023 with 1088 respondents. Data processing was done using non-parametric Mann-Whitney and Kruskal-Wallis statistics for normal distribution. The research results that consistently show a positive and significant influence are differences in regions and respondent positions. Factors not influencing school digitalization are gender and type of school. Inconsistently influential factors are the respondent's age, type of school transformation intervention, and school status. Regional differences, which indicate differences in school digitalization policies by local education leaders, positively influence the success of school digitalization. Likewise, the stronger a person's position in a school in pushing policy, the greater the influence on the quality of school digitalization. Thus, the two factors, namely a person's position and regional differences, indicating differences in leadership, are recommended to be strengthened to increase the success of implementing school digitalization policies.

Keywords: educational transformation, digitalization of learning, digitalization of management, digitalization of ways of working

1. Introduction

Implementing school digitalization policies in Indonesia still faces many obstacles, even though applying digital technology is necessary. Information technology has changed all areas of life [1]. Promoting digitalization in all social domains is currently one of the main political priorities worldwide [2] and [3]. The digitalization of education is becoming

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a prominent trend and monopolizing the focus of education policy attention in the European Union [4]. Even Russia has set a goal of creating digital schools by 2024 [5].

Today's children and teenagers are digital natives, growing up in a world where digitalization is a permanent fixture [6]. The world of the future will be dominated by the Alpha generation born after 2010, a generation that has been familiar with technology since they were young [7]. Digitalization is a challenge for the future, including for education policy [2] and [3]. Rapid growth and increasing access to technology encourage the implementation of Digital Didactical Design, which focuses on teacher and student activities [8].

Several research results show that the process of integrating digital technology in schools is complicated, and even digitalization initiatives in schools are complex to continue [9], [10], and [11]. The applied technology tends to support and reproduce previous practices rather than develop new ones [12]. One of the destructive consequences of using digital in education is the exclusion of experienced teachers versus teachers with lower digital competence, increasing the digital divide, formalization, and dehumanization of education [13]. Since the end of 2019, the Indonesian MOEC (Ministry of Education and Culture) has made a school digitalization policy. One form of this is assisting with tablet computers, PC servers, laptops, hard disks, routers, LCDs, and speakers to schools. This program is intended to accelerate and increase access while reducing disparities in the education sector by utilizing ICT. This school digitalization program uses the Rumah Belajar platform developed by the Center for Communication and Information Technology and launched by the Minister of Education and Culture, Muhadjir Effendy, in 2019 [14]. School digitalization became even more real when President Joko Widodo appointed Minister of Education Nadiem Makarim. School digitalization is firmly implemented in the Program Sekolah Penggerak (PSP) and Program Sekolah Menengah Kejuruan Pusat Keunggulan (PSMKPK).

In this era, school digitalization policies in Indonesia use various digital platforms to reduce complexity and increase efficiency and inspiration. This policy is contained in the Minister of Education, Culture, Research and Technology Decree No. 162/M/2021 concerning PSP and No. 165/M/2021 concerning PSMKPK. It was stated that the educational units implementing PSP and PSMKPK utilized technology platforms for learning and school management. The platform used is learning technology, namely the Platform Merdeka Mengajar (PMM), which contains student assessments and teaching tools for teachers. PMM can also be used to manage teacher profiles and develop teacher professions through independent training by teachers, inspirational videos, and proof of teacher work. Technology platforms for managing school resources are the school

procurement information system, School Activity Plan and Budget Application, and School Operational Assistance. The technology platform for managing educational profiles is the educational report card platform.

Based on previous research, it has not been found what factors positively and significantly influence the implementation of school digitalization policies in a region. Therefore, this research aims to determine: (1) what factors consistently positively and significantly influence the implementation of school digitalization policies? (2) what factors consistently do not influence the implementation of school digitalization policies? and (3) What factors do not consistently influence the quality of school digitalization implementation?

2. Method

The research used a quantitative approach with a descriptive survey design using Google Forms, distributed in the first semester of 2023. The research was conducted at the basic education level, especially at Junior High Schools (SMP) and Madrasah Stanawiyah (MTs), with a total of 1,088 respondents spread across six districts/cities, namely Semarang City, Demak Regency, Kendal Regency, Tegal Regency, Banyumas Regency, and Cilacap Regency in Central Java Province. Before testing the hypothesis, a data normality test was carried out, and the results were that the data was not normally distributed. Because the data is not normally distributed, the hypothesis test uses non-parametric statistics, namely the Mann-Whitney and Kruskal-Wallis tests with $\alpha = 0.05$. If $\alpha > 0.05$, then the hypothesis test is not significant. The Mann-Whitney test ($\alpha = 0.05$) is used to carry out comparative tests of two samples, while the Kruskal-Wallis test ($\alpha = 0.05$) is used to carry out comparative tests of more than two samples [15].

3. Result and Discussion

3.1. Results

Factors that consistently have a positive and significant effect. The research results that consistently show a positive and significant influence are differences in regions and respondent positions. There is a tendency that the more developed the region is, namely, the more urban or close to urban areas, the higher the quality of the implementation of school digitalization in the learning process, school management, and ways of working in schools. Likewise, a person's position also positively and significantly

influences the implementation of school digitalization. According to regional or regional differences, it can be seen in Table 1.

TABLE 1: Implementation of School Digitalization Quality Based on Regional Differences.

Implementation Region	Average Score			
	Digitalization of the Learning Process	Management Digitalization	Digitizing Humans Work	How
1. Banyumas (District)	507.16 (5)	565.04 (4)	558.98 (4)	
2. Cilacap (District)	518.49 (4)	616.07 (3)	656.61 (2)	
3. Demak (District)	626.10 (2)	675.52 (2)	610.45 (3)	
4. Kendal (District)	598.40 (3)	505.73 (5)	520.14 (5)	
5. Tegal (District)	479.17 (6)	467.28 (6)	448.96 (6)	
6. Semarang (City)	703.93 (1)	695.25 (1)	716.38 (1)	
Significance Value	0.000	0.000	0.000	

Note: (1), (2), etc., are in order from highest to lowest

According to the respondent’s job title or position, it can be seen in Table 2. The results consistently show that the significance test value is < 0.05.

TABLE 2: Implementation of School Digitalization Quality Based on Different Positions.

Implementation Region	Average Score			
	Digitalization of the Learning Process	Management Digitalization	Digitizing Humans Work	How
1. Committee/Parents	529.72 (4)	312.63 (4)	340.27 (4)	
2. Education Personnel	532.31 (3)	580.05 (3)	574.12 (3)	
3. Teachers	615.42 (2)	603.13 (2)	600.44 (2)	
4. Headmaster	617.01 (1)	643.83 (1)	641.64 (1)	
Significance Value	0.018	0.000	0.000	

Note: (1), (2), etc., are in order from highest to lowest

Factors that consistently do not have a positive and significant effect. Factors that consistently do not influence school digitalization are gender and type of educational unit. According to the gender of the respondents, it can be seen in Table 3.

According to the type of educational unit of the respondents, it is shown in Table 4. The results consistently show that the significance test value is > 0.05.

Factors whose influence is inconsistent. Inconsistently influential factors are the respondent’s age or generation, type of school transformation intervention and school status. According to the age or generation of respondents, it can be seen in Table 5.

According to the type of intervention, school transformation is shown in Table 6. The results are inconsistent, showing that the significance test value is greater or smaller

TABLE 3: Implementation of School Digitalization Quality Based on Gender Differences.

Implementation Region	Average Score			
	Digitalization of the Learning Process	Management Digitalization	Digitizing Humans Work	How
1. Male	557.55 (1)	528.18 (2)	533.73 (2)	
2. Female	535.54 (2)	555.71 (1)	551.90 (1)	
Significance Value	0.256	0.155	0.348	

Note: (1), (2), etc., are in order from highest to lowest

TABLE 4: Implementation of School Digitalization Quality Based on Different Types of Educational Units.

Implementation Region	Average Score			
	Digitalization of the Learning Process	Management Digitalization	Digitizing Humans Work	How
1. MTs	490.41 (2)	472.90 (2)	595.71 (1)	
2. SMP	546.24 (1)	546.81 (1)	542.85 (2)	
Significance Value	0.307	0.177	0.333	

Note: (1), (2), etc., are in order from highest to lowest

TABLE 5: Implementation of School Digitalization Quality Based on Differences in Age or Generation of Respondents.

Implementation Region	Average Score			
	Digitalization of the Learning Process	Management Digitalization	Digitizing Humans Work	How
1. Baby Boomers	583.87 (1)	584.47 (2)	600.60 (1)	
2. Gen X	529.25 (4)	586.17 (1)	564.62 (3)	
3. Gen Milenial	549.26 (3)	541.32 (3)	568.33 (2)	
4. Gen Z	569.31 (2)	360.89 (4)	380.64 (4)	
Significance Value	0.290	0.000	0.000	

Note: (1), (2), etc., are in order from highest to lowest

TABLE 6: Implementation of School Digitalization Quality Based on Different Types of School Transformation Interventions.

Implementation Region	Average Score			
	Digitalization of the Learning Process	Management Digitalization	Digitizing Humans Work	How
1. Non PSP	512.96 (2)	552.23 (1)	549.11 (1)	
2. PSP	609.62 (1)	528.54 (2)	534.99 (2)	
Significance Value	0.000	0.243	0.486	

Note: (1), (2), etc., are in order from highest to lowest

than 0.05. According to school status, it can be seen in Table 7. The results inconsistently show that the significance test value is greater or smaller than 0.05.

TABLE 7: Implementation of School Digitalization Quality Based on School Status.

Implementation Region	Average Score		
	Digitalization of the Learning Process	Management Digitalization	Digitizing How Humans Work
1. Private	535.74 (2)	464.21 (2)	555.14 (1)
2. Public	545.64 (1)	554.92 (1)	543.12 (2)
Significance Value	0.740	0.002	0.687

Note: (1), (2), etc., are in order from highest to lowest

4. Discussion

The region or area that consistently gets the highest score is Semarang City; the one that always gets the lowest score is Tegal Regency. Semarang City represents an urban area with good digital access, while Tegal Regency tends to be lower in digital access. These results show the influence of digital access on the quality of implementation of school digitalization policies. Digital access in urban areas is better than in rural or suburban areas, affecting digitalization quality in learning, school management, and how things work in schools. Based on 2017 Association of Indonesian Internet Service Providers data, the internet penetration rate in urban areas is better than in rural areas, namely 72.41% > 48.25% [16]. The availability of digital access cannot be separated from the commitment of regional leaders to budget and realize digital infrastructure, such as Pariaman City as a smart city that received an award from the Ministry of Communication and Information [17].

In several developed countries, the internet has been used since 1980 through internet technology, interactive multimedia, Massive Open Online Courses, Social Computing, and Cloud Computing [18] and for the teaching and learning process. Meanwhile, in Indonesia, most teachers do not yet use the internet for learning. In 2020, only 9% of teachers used e-learning at the Ministry of Education in the home learning channel and 22% online at the Ministry of Religion [19]; only 1% of school and madrasah students used online learning. The Indonesian Government and Regional Governments should support infrastructure such as technological devices and the internet, systematic efforts are needed to improve the quality of virtual learning [20], [21], and Regional Governments are asked to be more active in realizing school digitalization [22].

The position or position of the school principal has the highest average score in digitizing the teaching and learning process, management, and the way the school community works. In contrast, the school committee position consistently gets the lowest score. Meanwhile, educators or teachers are consistently in second place, and educational staff in third place. This shows that the people closest to decision-making in schools are increasingly confident that the quality of school digitalization implementation is improving. This is because school principals have an essential role in implementing the digitalization of education [23]. Meanwhile, teachers are less prepared regarding digital learning content, even though they feel they receive information more quickly in the context of educational policy communication [24].

Table 3 shows no consistency between male or female respondents who are higher or lower. This is because internet access between men and women is not much different. National Socioeconomic Survey data for 2019 showed that internet access for women only experienced a slight gap between 2016 and 2019. In 2016, the difference between female internet users was 7.6% less than men, 7.04% in 2017, 6.34% in 2018, and 6.26% in 2019 [16]. This shows that the gap between men's and women's internet usage continues to decline towards balance.

Table 4 also shows no consistency between higher or lower MTs or SMP respondents. So far, Islamic boarding schools and madrasas under the guidance of the Ministry of Religion are lagging in the digitalization of education. However, Islamic boarding schools are also active in Semarang, implementing digitalization policies in the education process [25]. Likewise, the same spirit also occurs in Madrasas [26].

One of the factors that influences a person's mastery of technology is age [27]. Table 5 also shows no consistency between respondents based on age or higher or lower generation. However, the study from the Ministry of Education and Culture's Center for Communication and Information Technology stated that only 40% of teachers were ready with technology, and the remaining 60% said they were not ready [27]. Mark McCrindle classifies a person's age concerning the development of information technology, such as the Baby Boomer generation.

Table 6 also shows no consistency between respondents based on the type of school transformation intervention between the Program Sekolah Penggerak (PSP) or Driving School Program and the higher or lower level of the Driving School Program. One of the interventions provided to schools in the Driving School Program is school digitalization. Driving school digitalization through the learning process, teacher competency development, and school governance [28]. This isn't very pleasant if driving schools are not better at implementing digitalization policies. On the other hand, the results of this

research show that schools that did not receive intervention from driving schools also feel the importance of implementing digitalization to improve the quality of education.

Table 7 also shows no consistency between respondents based on higher or lower public or private school status. Both public and private schools experience the same obstacles in implementing school digitalization policies. Both public and private schools experience problems regarding access to digital facilities, adequacy, and skills of human resources in mastering digital knowledge [29].

5. Conclusion

Regional differences that indicate a commitment to realizing digital infrastructure in a region positively influence the success of school digitalization. Likewise, the stronger a person's position in a school in pushing policy, the greater the influence on the quality of school digitalization. Thus, both factors, namely a person's position and the commitment of regional leaders, are recommended to be strengthened to increase the success of implementing school digitalization policies.

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