Volume 15 Number 1 (2023)
January-June 2023
Page: 341-352

E-ISSN: 2656-9779
P-ISSN: 1907-6355
DOI: 10.37680/qalamuna.v15i1.2332

QALAMUNA
JURNAL PENDIDIKAN, SOSIAL, DAN AGAMA

The Effect of Government ICT Policy and Technology Leadership on Teacher's Technology Integration

Shinta Setia [1], Sulthan Muhammad Aufar [2]

[1] Universitas Hayam Wuruk Perbanas, Surabaya, Indonesia; shinta.setia@perbanas.ac.id
[2] Universitas Airlangga, Surabaya, Indonesia; shinta.setia@perbanas.ac.id

Received: 10/01/2023 Revised: 12/03/2023 Accepted: 07/05/2023

Abstract

This study aims to analyze the influence of principals' technology leadership on teachers' technology integration and the moderating role of government ICT policy in all public junior high schools in Surabaya in the new normal era. The research sample consisted of 100 respondents, including 25 principals and 75 teachers from State Junior High Schools in Surabaya with high technology implementation. The data in this study were successfully collected through questionnaires. All collected data will be processed using the PLS-SEM method in the SmartPLS 3.0 software by setting a significance level of 5%. The results indicate that technology leadership positively and significantly affects teachers' technology integration. Further, the results show the role of government ICT policy, which has been proven to strengthen the positive influence of technology leadership on teachers' technology integration.

Keywords

Technology; Leadership; Education; Government; ICT Policy

Corresponding Author
Shinta Setia
Universitas Hayam Wuruk Perbanas, Surabaya, Indonesia; shinta.setia@perbanas.ac.id

Published by Institut Agama Islam Sunan Giri (INSURI) Ponorogo; Indonesia
Accredited Sinta 2

1. INTRODUCTION

The learning system is growing every year. Teachers in the 21st century face increasingly diverse challenges. Teachers must also be able to deal with students with various characteristics, learning materials that are more complex and complicated, and higher standards of learning processes (Darling-Hammond, 2006). Teachers' demands in the 21st century are increasingly complex with the Covid-19 pandemic that hit Indonesia and forced changes to the learning system from offline to online. In 2020, the World Health Organization (WHO) determined that the coronavirus (Covid-19) spread as an infectious disease has become a serious problem and caused a global pandemic. The Covid-19 pandemic has impacted almost all aspects of life, from health, economic, social, and cultural, to educational aspects in Indonesia.

Before Covid-19, the use of technology was growing. The use of technology in Indonesia has also increased since the Indonesian government implemented Large-Scale Social Restrictions (PSBB) to reduce the spread of Covid-19. Reporting from the website www.indonesiabaik.id, the government stated that starting April 15, 2020, Indonesia will experience PSBB (Indonesia Baik, 2020). The implementation of the PSBB is regulated in Government Regulation Number 21 of 2020, which President Jokowi signed. This limitation forces people to be more skilled in using technology. For example, offline meetings turn online using various applications such as Zoom Meeting, Google Meet, Skype, etc.

The education sector is also one of the sectors affected by the PSBB policy launched by the government. Before the Covid-19 pandemic, education in Indonesia was carried out through Face-to-Face Learning (PTM) with students and teachers coming to school to participate in learning activities. However, this condition changed when the Covid-19 pandemic hit Indonesia. During the Covid-19 pandemic, Indonesian education was forced to switch from PTM to online learning. The advantage of online learning is the flexibility of time and location, which can be accessed anytime and anywhere (Wicaksono & Setyowati, 2022). The school management has also changed. Schools are very dependent on technology, the emergence of new curricula, and new forms of collaboration (Schleicher, 2018). This also changes the role of the principal, who must navigate change and work in new ways (Pont, 2020). Due to these changing conditions, the principal, as a technology leader, must ensure that teachers and students are integrated with digital tools and platforms to succeed in teaching and learning activities. The government's role is also the key to success. In the circular letter, the government orders the entire learning process to be carried out from home through online or distance learning which is carried out so that the learning process continues for students.

The success of online learning activities must be supported by various parties, especially the school as the organizer of learning activities. The principal as the school leader is responsible for ensuring that all learning activities run well, especially during the distance learning period. The role of school principals has shifted to technology leadership in schools, especially during the Covid-19 pandemic (Grady, 2011). According to Anderson and Anderson and Dexter (2005) and Dexter (2011), technology leadership (TL) represents all technology-related activities in schools including organizational decisions, policies, and technology implementation. Technology leadership places great emphasis on leaders (principals) ability to develop, manage, guide, and apply information and communication technology knowledge to improve the performance of their institutions (Chin, 2010). The International Society for Technology in Education (ISTE) has compiled standards for school principals (educational leaders) in 2021 regarding what responsibilities a school principal must have as a leader to lead the application of technology in their schools. This standard can be found on the website www.iste.org (ISTE, 2021). The ISTE standard regarding technology leadership from school principals has five dimensions, namely (1) Equity, and Citizenship Advocate, (2) Visionary Planner, (3) Empowering Leader, (4) System Designer, and (5) Connected Learner.

The principal must provide examples of the use of technology to all school members, especially

teachers. This is because the teacher is the front guard in the learning process with students at school. Therefore, school principals must have the character of technology leadership to be able to form technology integration among teachers in their schools (teachers technology integration). Teachers' Technology Integration (TTI) is the incorporation of technological resources and technology-based practices into daily routines, work, and school management. Technological resources include computers, specialized software, network-based communication systems, and other equipment and infrastructure (NCES, 2003). According to Reid (2002), the concept of technology integration consists of the process of using information and communication technology (ICT) tools for teaching in the classroom. This research refers to the six indicators of teachers' technology integration introduced by Vannatta and Banister (2009).

Success in online learning is not only due to the principal's leadership style, teacher competency, and the availability of student devices and connections. The government's role is also the key to the success of teaching and learning activities in schools, especially during online learning during the Covid-19 pandemic. Government ICT policy demonstrates that government policies related to information and communication technology (ICT) are structured in line with broader educational goals and take into account the level of socio-economic development and local status of digital transformation (Wu et al., 2019). Government ICT Policy (GIP) is a policy made by governments and stakeholders committed to bringing digital technology to all individuals and communities so that they can have access to technology (Pelletier, 2011). This research refers to the 11 indicators of government ICT policy introduced by Law et al. (2011). The results of research by Wu et al. (2019) reveal that there is a significant influence of e-leadership by school principals on digital transformation in schools and emphasizes the important role of e-leadership in information and communication technology transformation models. The ICT transformation model consisting of several phases including the development of ICT infrastructure and the integration of ICT into teaching and learning is a global trend (Becta, 2007).

The government's support for applying information and communication technology in schools can take various forms. Some of them are by providing a budget (such as BOS funds), providing facilities and infrastructure support (such as providing computers for school laboratories), to providing training on learning support applications (such as Microsoft Office 365 training). The government's role in technology is increasingly visible during online learning during the Covid-19 pandemic, which forced the relevant government to change the learning system from face-to-face (offline) to distance learning (online). The government did this as a form of implementation of central government policies regarding orders to carry out Large-Scale Social Restrictions (PSBB). The Surabaya City Education Office in particular, has organized training regarding the use of Microsoft Office 365 which can support online learning remotely. The government also continues to ensure the availability of internet access for students by assisting in the form of data packages. The Surabaya City Education Office has also provided various platforms or online applications that school principals and teachers can use to facilitate interaction with students and in the process of teaching and learning activities. However, not all schools have utilized this application. Based on information from the Surabaya City Education Office, there are three categories of schools based on technology implementation through the use of applications that have been provided, namely high IT application usage (technology applications that have been adopted > 20 application networks), moderate IT application usage (technology applications that 10 -20 application networks have adopted), and low IT application usage (technology applications adopted < 10 application networks).

This study tries to adopt previous research by changing the settings used, namely all public junior high schools in Surabaya. This study aims to analyze the effect of technology leadership on school principals on teachers' technology integration and the moderating role of government ICT policy in all public junior high schools in Surabaya in the new normal era. This study used a questionnaire distributed to 100 respondents as a research instrument which would then be processed using the PLS-

SEM analysis technique. The results indicate that technology leadership positively and significantly affects teachers' technology integration. Further, the results show the role of government ICT policy, which has been proven to strengthen the positive influence of technology leadership on teachers' technology integration.

Theoretically, this research can provide insight and information regarding the influence of technology leadership on school principals on teachers' technology integration. In addition, this research can also be used as a reference for the development of further research on the topic of technology leadership and teachers' technology integration. Practically, the results of this study can be used as material for consideration for the Surabaya City Education Office in formulating policies related to the application of technology in learning activities, especially in the new normal era. One of these policies is to determine a technology leader who understands the use or integration of technology as a requirement in selecting school principals.

This article consists of 4 parts. The first part describes the introduction and background of this research, the second part describes the research method, the third section describes the results and discussion of the processing of this research data, and the last section explains the conclusions and limitations of the research.

2. METHODS

According to Anderson and Anderson and Dexter (2005) and Dexter (2011), technology leadership (TL) represents all technology-related activities in schools, including organizational decisions, policies, and technology implementation. Technology leadership places great emphasis on leaders' (principals) ability to develop, manage, guide, and apply information and communication technology knowledge to improve the performance of their institutions (Chin, 2010). The International Society for Technology in Education (ISTE) has compiled standards for school principals (educational leaders) in 2021 regarding what responsibilities a school principal must have as a leader to lead the application of technology in their schools. This standard can be found on the website www.iste.org (ISTE, 2021). The ISTE standard regarding technology leadership from school principals has five dimensions, namely (1) Equity, and Citizenship Advocate, (2) Visionary Planner, (3) Empowering Leader, (4) System Designer, and (5) Connected Learner.

Teachers' Technology Integration (TTI) incorporates technological resources and technology-based practices into daily routines, work, and school management. Technological resources include computers, specialized software, network-based communication systems, and other equipment and infrastructure (NCES, 2003). According to Reid (2002), the concept of technology integration consists of the process of using information and communication technology (ICT) tools for teaching in the classroom. This research refers to the six indicators of teachers' technology integration introduced by Vannatta and Banister (2009).

Government ICT Policy (GIP) is a policy made by governments and stakeholders committed to bringing digital technology to all individuals and communities so that they can have access to technology (Pelletier, 2011). This research refers to the 11 indicators of government ICT policy introduced by Law et al. (2011).

The approach used in this research is quantitative. Technology leadership (TL) acts as an independent variable in this study. Teachers' Technology integration (TTI) acts as the dependent variable. Meanwhile, the uniqueness of this research is the use of government ICT policy (GIP) as a moderating variable. The hypothesis built in this study is as follows:

H1 : Technology Leadership has a positive effect on Teacher Technology Integration

H2 : Government ICT Policy strengthens the influence of Technology Leadership on Teacher

Technology Integration

Population and Research Sample

The population of this study was all principals and teachers in all public junior high schools in Surabaya, totaling 63 principals and 2,207 teachers. This study used a purposive sampling technique in determining the number of research samples based on certain predetermined criteria. The following are the criteria for the purposive sampling used:

a. State Junior High Schools in Surabaya which are included in the list of schools with high technology implementation based on recommendations from the Surabaya City Education Office.
b. Served as school principal at State Junior High School in Surabaya (Technology Leadership)
c. Served as teachers who are closely related to technology development in schools (Teachers technology integration), including deputy principals for curriculum, IT coordinating teachers, and subject teachers (representatives) for each school.

Concerning predetermined criteria and the minimum number of samples, the sample in this study as a whole was 100 respondents from school residents including 25 school principals and 75 teachers of public junior high schools in Surabaya.

Data Collection Technique

This study used primary data where data collection was carried out online using Google Forms as a research questionnaire which was distributed to 100 respondents. To avoid and reduce bias in filling out the questionnaire, the respondent's data in the research is anonymous so that the respondent can fill out the questionnaire correctly. The measurement scale in this study uses a Likert scale with a score of 5 for "strongly agree", 4 for "agree", 3 for "neutral", 2 for "disagree", and 1 for "strongly disagree".

Analysis Techniques

This study uses descriptive statistics and PLS-SEM as an analytical technique using SmartPLS 3.0 software. to test the measurement model of the outer model (measurement model) and the inner model (structural model). Outer model measurement tests consist of composite reliability tests, convergent validity tests, and discriminant validity tests. While the inner model measurement test is carried out by testing the R-square (R2) and Q-square predictive relevance.

3. FINDINGS AND DISCUSSIONS

Based on the questionnaires collected, it can be concluded that the 100 research respondents consisted of 40% male and 60% female, and most of the respondents had an undergraduate education level of 62%. The principal respondents was dominated by principals who had served as school principals for more than 12 years, namely 8 respondents or 32%. Meanwhile, the teacher respondents were dominated by respondents who had served as teachers in state junior high schools for a period of 10-20 years, namely 32 respondents or 43%. In addition, the research sample was dominated by respondents aged more than 50 years, namely 49% of all respondents. The research sample is also dominated by respondents who have been able to utilize technology in several applications, which is as much as 33%.

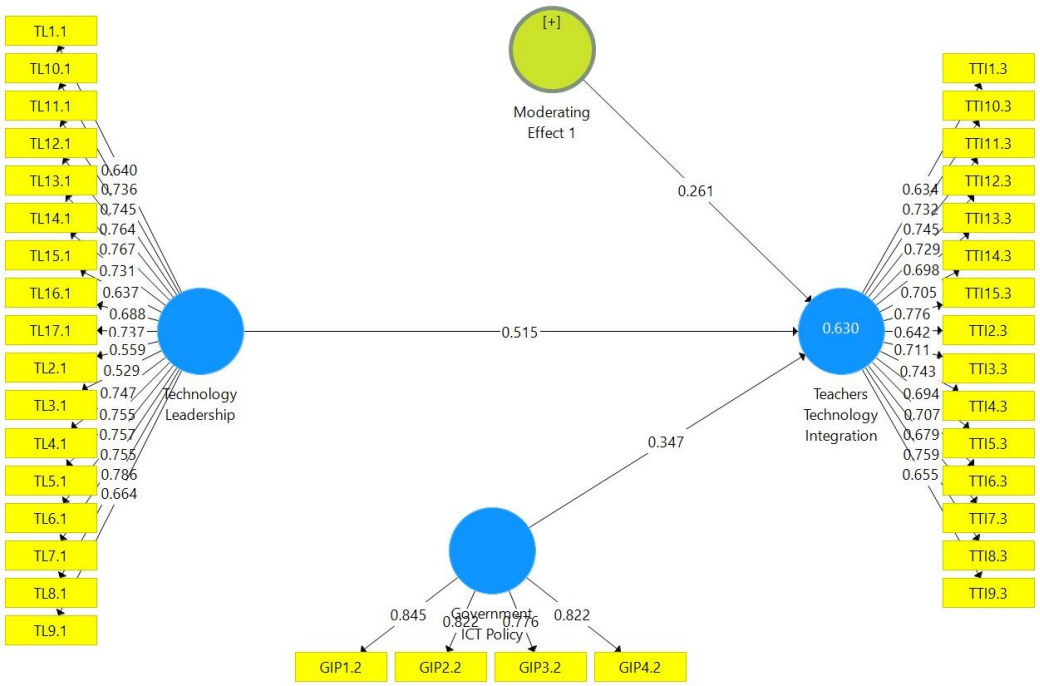

Figure 1. Outer Model Evaluation Results

Table 1. Loading Factor Test Results

Variables	Indicator	*Loading Factor* Value	Conclusion
Technology Leadership	TL1	0.640	Considered
	TL2	0.559	Considered
	TL3	0.529	Considered
	TL4	0.747	Valid
	TL5	0.755	Valid
	TL6	0.757	Valid
	TL7	0.755	Valid
	TL8	0.786	Valid
	TL9	0.664	Considered
	TL10	0.736	Valid
	TL11	0.745	Valid
	TL12	0.764	Valid
	TL13	0.767	Valid
	TL14	0.731	Valid
	TL15	0.637	Considered
	TL16	0.688	Considered
	TL17	0.737	Valid
Teachers Technology Integration	TTI1	0.683	Considered
	TTI2	0.642	Considered
	TTI3	0.711	Valid
	TTI4	0.743	Valid
	TTI5	0.694	Considered
	TTI6	0.707	Valid
	TTI7	0.679	Considered
	TTI8	0.759	Valid
	TTI9	0.655	Considered
	TTI10	0.732	Valid
	TTI11	0.745	Valid
	TTI12	0.729	Valid
	TTI13	0.698	Considered

Variables	Indicator	*Loading Factor* Value	Conclusion
	TTI14	0.705	Valid
	TTI15	0.776	Valid
Government ICT Policy	GIP1	0.845	Valid
	GIP2	0.822	Valid
	GIP3	0.776	Valid
	GIP4	0.822	Valid
Moderation	TL*GIP	0.839	Valid

Based on the convergent validity test results by considering the outer loading value. The results show that there are 25 indicators out of 37 indicators (including moderation) show values that meet the requirements and are valid because they have an outer loading value above 0.7. At the same time, the remaining 12 indicators show a value that can still be considered because it has an outer loading value between 0.4 to 0.6. None of the indicators show invalid values, so no indicators are eliminated.

Table 2. Cross Loading Value

Indicators	Technology Leadership	Teachers Technology Integration	Government ICT Policy	Moderating Effect
TL1	**0.640**	0.442	0.419	-0.227
TL2	**0.559**	0.308	0.196	-0.037
TL3	**0.529**	0.478	0.508	-0.158
TL4	**0.747**	0.433	0.459	-0.150
TL5	**0.755**	0.428	0.483	-0.161
TL6	**0.757**	0.585	0.477	0.030
TL7	**0.755**	0.654	0.476	-0.102
TL8	**0.786**	0.598	0.296	0.113
TL9	**0.664**	0.308	0.196	-0.037
TL10	**0.736**	0.637	0.524	-0.074
TL11	**0.745**	0.567	0.457	-0.044
TL12	**0.764**	0.424	0.483	-0.304
TL13	**0.767**	0.440	0.474	-0.231
TL14	**0.731**	0.509	0.577	-0.198
TL15	**0.637**	0.332	0.367	-0.208
TL16	**0.688**	0.424	0.446	-0.167
TL17	**0.737**	0.547	0.572	-0.174
TTI1	0.387	**0.634**	0.469	0.195
TTI2	0.275	**0.642**	0.499	0.274
TTI3	0.540	**0.711**	0.473	0.259
TTI4	0.546	**0.743**	0.526	0.162
TTI5	0.391	**0.694**	0.550	0.097
TTI6	0.499	**0.707**	0.562	0.079
TTI7	0.399	**0.679**	0.460	0.158
TTI8	0.523	**0.759**	0.528	0.074
TTI9	0.311	**0.655**	0.377	0.136
TTI10	0.451	**0.732**	0.497	0.055
TTI11	0.442	**0.745**	0.451	0.274
TTI12	0.483	**0.729**	0.353	-0.023
TTI13	0.539	**0.698**	0.406	0.143
TTI14	0.689	**0.705**	0.493	-0.065
TTI15	0.717	**0.776**	0.562	-0.053
GIP1	0.521	0.549	**0.845**	0.138
GIP2	0.500	0.548	**0.822**	0.074
GIP3	0.437	0.470	**0.776**	0.140
GIP4	0.587	0.643	**0.822**	-0.136
TL*GIP	-0.165	0.152	0.052	**1.000**

Based on the results of discriminant validity testing based on the cross-loading value of this research model. To compare the relationship among the indicator, its variables and other variables more easily, the loading value is in bold as a sign of the relationship between the indicator and the variable. The discriminant validity results using the cross-loading value show that the relationship between each indicator and its variables is higher when compared to other variables. It can be concluded that all indicators and variables have good discriminant validity.

Table 3. Composite Reliability Test Results

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Technology Leadership	0.938	0.945	0.503
Teachers Technology Integration	0.929	0.938	0.502
Government ICT Policy	0.834	0.889	0.667
Moderating Effect	1.000	1.000	1.000

Based on the results of the composite reliability test of this research model. The test results show that based on Cronbach's alpha value, each variable shows a value above 0.7, so it can be concluded that all variables meet the composite reliability criteria. On the other hand, the composite reliability value of all variables also meets the criteria because it shows a value above 0.7, and is also supported by the Average Variance Extracted (AVE) value of each variable which shows a value above 0.5. It can be concluded that based on Cronbach's alpha, composite reliability, and AVE values, it shows that all variables meet the criteria and have good composite reliability.

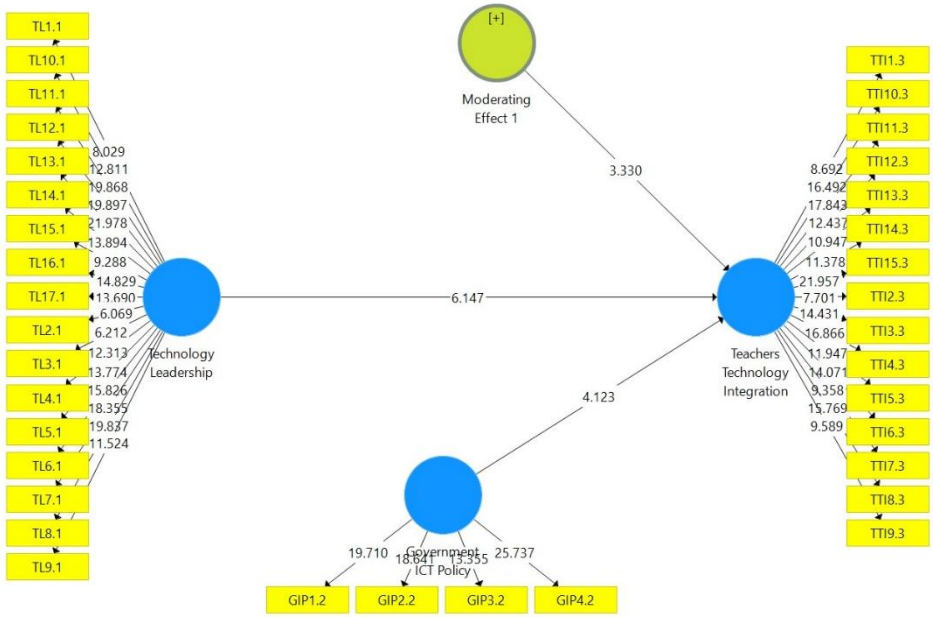

Figure 2. Inner Model Evaluation Results (Bootstrapping)

Based on the test results of the coefficient of determination. The results of testing the coefficient of determination show that in this research model, R-square has a value of 0.630. This means that technology leadership and government ICT policies can influence 63% of the teacher's technology integration variable. While exogenous variables outside this research model influence the remaining 37%.

Table 4. Q-Square Value

Variables	SSO	SSE	Q^2 (=1-SSE/SSO)
Technology Leadership	1700.000	1700.000	
Teachers Technology Integration	1500.000	1078.991	0.281
Government ICT Policy	400.000	400.000	
Moderating Effect	100.000	100.000	

Based on the results of the Q^2 test it can be said to be good if it has a value greater than 0.000. The results of the Q^2 calculation based on the table show a value of 0.281 greater than 0.000. That is, the prediction model proposed in this study is good and meets the requirements of the goodness of the model (model fit).

Table 5. Path Coefficient Results

Variables	Original Sample (O)	T-Statistics	P-Values	Conclusion
TL → TTI	0.515	6.147	0.000	Significant
GIP → TTI	0.347	4.123	0.000	Significant
Moderating Effect → TTI	0.261	3.330	0.001	Significant

Based on the results of testing path coefficients using bootstrapping. The results show that technology leadership positively and significantly affects teachers' technology integration. There is a positive and significant relationship at the 1% level. This is indicated by the original sample (O) positive value of 0.515 and a p-value of 0.000. On the other hand, the government ICT policy has a positive and significant effect on teachers' technology integration. The original sample value (O) shows a value of 0.347, while the p-value shows a value of 0.000. The higher the level of technology leadership of the school principal, the higher the teachers' technology integration. This result is consistent with the hypothesis that has been built, so it can be concluded that hypothesis 1 is accepted. The principal as a technology leader is one of the keys to the successful application or integration of technology in schools for teachers and students. This character is important for school principals to have, especially in the digital era and the current new normal era which forces technology in the learning system to be increasingly used. The principal as a technology leader leads the coordination of all school work programs, one of which is a work program related to the use of information and communication technology.

The results of this study support the research of A'mar and Eleyan (2022), AlAjmi (2022), and Thannimalai and Raman (2018). Studies show that principals as technology leaders positively influence technology integration in their schools, especially the integration of teachers. Thannimalai and Raman (2018) state that strong technology leadership is needed to ensure increased use of the internet, technology integration, and the use of technological devices by students in schools. Principals must have the best practice and knowledge to ensure the implementation of technology integration in their schools. In addition, school principals' awareness of the importance of professional development in the field of technology can assist them in the effective application of technology in schools.

The principal must be able to integrate all components of the school, especially the teacher as the main support in learning activities. According to Ugur and Koç (2019), school principals are responsible for integrating technology into schools. This role can assist teachers in meeting all the learning challenges in the 21st century, which require teachers to provide intellectual-related teaching and use technology in learning and everyday life for students. This responsibility is especially needed, especially in the new normal era, where the learning system has changed from face-to-face learning to online-based learning. Even though schools have started to return to face-to-face meetings, the application of technology in learning activities is still very much needed, for example, in carrying out e-exams, and e-reports, as well as collecting assignments and providing information through social media and other technological tools.

Technology integration in schools allows teachers to achieve various goals and roles of teachers in

the 21st century. Learning in the 21st century demands an increase in the pedagogical abilities of teachers as teachers are better able to design more effective and innovative learning by utilizing developments in information and communication technology (Tarihoran, 2019). In addition to the success of online learning, the integration of technology also allows teachers to be able to utilize it for administrative purposes, such as by recording attendance, marking manuscripts submitted via online platforms, and submitting student details to authorities such as school administrators (AlAjmi, 2022). Teachers can use various types of technology devices, such as tablets, computers, and laptops, to access course content and lessons. Through this tool, teachers can more easily explain learning materials that are creative and easy to use. This integration can make it easier for teachers to interact with students and parents, especially in the current new normal era. Therefore, technology integration is needed in schools in the new normal era. Individual school leaders achieve technical knowledge related to the application of technology and then disseminate it to teachers through vision and collaboration (AlAjmi, 2022). The encouragement and support of principals and teachers in embedding information and communication technology (ICT) will result in changes in teaching practices that are more connected to technology (Al Sharija & Qablan, 2012).

The results of the moderating effect show that government ICT policy can strengthen the influence of these two variables. This is shown from the original sample value (O) of 0.261 and a p-value of 0.007. This result is consistent with the hypothesis that has been built, so it can be concluded that hypothesis 2 is accepted. Government ICT Policy is a policy created by governments and stakeholders committed to bringing digital technology to all individuals and communities so that they can have access to technology (Pelletier, 2011). Principals must always maintain good relations with stakeholders, one of which is the relevant government. The principal as a party plays a role in leading the coordination of the use of technology in schools as a form of implementing work programs and policies that the government has prepared. The government has a role in providing ICT infrastructure, technical support, funding for ICT infrastructure, general funding for school activities, developing professional courses for teachers, and organizing experience and knowledge sharing between schools (Law et al., 2011:125). Government support in technology integration can be in the form of providing training related to digital-based learning tools (for example Quizziz, Kahoot, Microsoft Office 365, and others) for both school principals and teachers, providing budget allocations for investment in IT infrastructure in schools, providing assistance related to accessing and internet connection at school (both for teachers and students), and other forms of support. This support will facilitate the process of technology integration for teachers.

The government is in charge of making policies or regulations related to the education system. One of them is a policy related to technology implementation in the digital era. Every program made by schools must always refer to policies or regulations made by the government. Any funds provided by the government to schools (for example, to support IT infrastructure) must be accountable to the government.

This study has several limitations, namely the range of respondents used as the research sample is limited to 100 school residents, including 25 school principals and 75 teachers from Public Junior High Schools in Surabaya, which are included in the list of schools with high technology implementation based on the recommendations of the City Education Office Surabaya, so the results of this study cannot be generalized to private schools. Future research can broaden the scope of respondents by including school principals and teachers from private schools as research samples so that a broader picture can be obtained regarding the influence of technology leadership on teachers' technology integration and the moderating role of government ICT policy. Policymakers (especially the relevant government) can use this broader picture to make policies related to information and communication technology in all schools under their auspices. Further research can use more variables that can reflect the factors that can affect teachers' technology integration. In addition, further research can add data collection methods using group discussion forums with schools and the education office to improve the information

obtained and the research results more relevant.

4. CONCLUSION

Based on the test results using the PLS-SEM method with the help of SmartPLS 3.0 software, several conclusions are obtained from the research results. First, technology leadership has proven to positively and significantly affect teachers' technology integration. Principals who have a higher spirit of technological leadership will affect the better integration of teacher technology. Second, the government ICT policy is proven to be able to strengthen the positive and significant influence of technology leadership on teachers' technology integration. Various forms of government support, especially in terms of information and communication technology, can strengthen the technology leadership role of school principals in influencing technology integration among teachers.

REFERENCES

A'mar, F., & Eleyan, D. (2022). Effect of Principal's Technology Leadership on Teacher's Technology Integration. International Journal of Instruction, 15(1). 781-798. https://doi.org/10.29333/iji.2022.15145a

Al Sharija, M., & Qablan, A. (2012). Leadership strategies for integration of ICT in Kuwait schools: Perceptions, practices and possibilities. Public Policy and Administration Research, 2(6), 18–28.

AlAjmi, M. K. (2022). The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait. International Journal of Educational Research, 112, 101928. https://doi.org/10.1016/j.ijer.2022.101928

Anderson, R. E., & Dexter, S. (2005). School technology leadership: An empirical investigation of prevalence and effect. Educational Administration Quarterly, 41(1), 49–82. https://doi.org/10.1177/0013161X04269517

Becta. (2007). Harnessing Technology Review 2007: Progress and impact of technology in education. Becta Coventry,, UK.

Chin, J. M. (2010). Theory and application of educational leadership. TW: Wunan.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. Journal of Teacher Education, 57(3), 300–314. https://doi.org/10.1177/0022487105285962

Dexter, S. (2011). About this special issue of technology leadership. Journal of School Leadership, 21(2), 162–165. https://doi.org/10.1177/105268461102100201

Direktorat Jenderal Pencegahan dan Pengendalian Penyakit. (2021). Penguatan Sistem Kesehatan dalam Pengendalian COVID-19. Kementerian Kesehatan Republik Indonesia. http://p2p.kemkes.go.id/penguatan-sistem-kesehatan-dalam-pengendalian-covid-19/

Grady, M. L. (2011). Leading the technology-powered school. Corwin Press.

Indonesia Baik. (2020). Penerapan PSBB di Sejumlah Wilayah Indonesia. https://indonesiabaik.id/infografis/penerapan-psbb-di-sejumlah-wilayah-indonesia

ISTE, I. S. for T. in E. (2021). ISTE STANDARDS: EDUCATION LEADERS. https://www.iste.org/standards/iste-standards-for-education-leaders

Law, N., Yuen, A., & Fox, R. (2011). Educational innovations beyond technology: Nurturing leadership and establishing learning organizations. Springer Science & Business Media.

Pelletier, M. (2011). Impact of Information and Communication Technologies (ICTs) in the

Advancement and Empowerment of African Women. In Handbook of Research on Information Communication Technology Policy: Trends, Issues and Advancements (pp. 402–420). IGI Global. https://doi.org/10.4018/978-1-61520-847-0.ch023

Pont, B. (2020). A literature review of school leadership policy reforms. European Journal of Education, 55(2), 154-168.

Reid, S. (2002). The integration of information and communication technology into classroom teaching. Alberta Journal of Educational Research, 48(1). https://doi.org/10.11575/ajer.v48i1.54909

Schleicher, A. (2018). Educating learners for their future, not our past. ECNU Review of Education, 1(1), 58-75.

Tarihoran, E. (2019). Guru dalam pengajaran abad 21. SAPA-Jurnal Kateketik Dan Pastoral, 4(1), 46–58. https://doi.org/10.53544/sapa.v4i1.68

Thannimalai, R., & Raman, A. (2018). The Influence of Principals' Technology Leadership and Professional Development on Teachers' Technology Integration in Secondary Schools. Malaysian Journal of Learning and Instruction, 15(1), 203–228. https://doi.org/10.32890/mjli2018.15.1.8

Ugur, N. G., & Koç, T. (2019). Leading and Teaching with Technology: School Principals' Perspective. International Journal of Educational Leadership and Management, 7(1), 42–71. https://doi.org/10.17583/ijelm.2018.3758

Vannatta, R., & Banister, S. (2009). Validating a measure of teacher technology integration. Society for Information Technology & Teacher Education International Conference, 1134–1140. Retrieved from https://www.learntechlib.org/primary/p/30757/.

Wicaksono, A., & Setyowati, L. (2022). Teacher's Perspectives of Online Learning vs. Offline Leaning: A Case Study from West Java. KnE Social Sciences, 2022, 86–95. https://doi.org/10.18502/kss.v7i7.10653

Wu, B., Yu, X., & Hu, Y. (2019). How does principal e‐leadership affect ICT transformation across different school stages in K‐12 education: Perspectives from teachers in Shanghai. British Journal of Educational Technology, 50(3), 1210–1225. https://doi.org/10.1111/bjet.12766